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**PLANCK/LFI OPTICAL SIMULATIONS:  
A STUDY ON THE FULL PATTERN PREDICTION  
WITH GRASP8 MULTI-REFLECTOR GTD**

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SUMMARY – The Multi-Reflector GTD (MGTD), a new add-on package of GRASP8<sup>1</sup>, is a suitable method for predicting the full-sky radiation pattern of complex mm-wavelength optical systems. Although MGTD is in general less time consuming than PO (Physical Optics), it should be applied in a rigorous way in order to obtain truthful results, specially at low power levels (down to  $\sim -50$ dB). In this report we describe a method for applying the MGTD on the analysis of the Planck Telescope, taking into account the effect of shields.

## 1 Introduction

The study of Cosmic Microwave Backgroud (CMB) anisotropies represents one of the most powerful tools for Cosmology. The shape of the angular power spectrum of CMB anisotropies sensibly depends on fundamental cosmological parameters and an accurate measure of the spectrum is a mighty way to establish the value of these parameters.

The PLANCK Mission is designed to image the CMB anisotropies over the whole sky, with unprecedented sensitivity ( $\frac{\Delta T}{T} \simeq 2 \div 4 \cdot 10^{-6}$ ) and angular resolution (typically 10 arcmin at 100 GHz) in a wide frequency range, from 30 to 857 GHz. The Low Frequency Instrument (LFI) is one of the two instruments onboard the PLANCK satellite. It is an array of 54 cooled HEMT-based receivers coupled to a 1.5 meter off-axis dual reflector telescope by an array of 27 dual profiled corrugated feed horns.

Owing to the small level of the CMB anisotropies ( $\simeq 10 \mu\text{k rms}$ ), the control of systematic effects is mandatory. This can be done by a dedicated instrument design and by an accurate knowledge of instrumental characteristics. Specifically, the non-ideal response of the telescope is a source of systematic errors both in the main beam region (aberrations) and in the sidelobes

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<sup>1</sup>GRASP8 is a software developed by TICRA (Copenhagen, DK) for analysing general reflector antennas.

region (straylight contamination). In order to evaluate and control these systematics, efficient and accurate radiation pattern simulations of the telescope-feed system are mandatory.

To predict the radiation pattern different techniques can be applied. Physical Optics (PO) is the most accurate one and may be used in all regions of the space surrounding the reflector antenna system, if PO is used together with Physical Theory of Diffraction (PTD). Unfortunately, as the frequency increases the reflectors have to be more and more precisely sampled. As a consequence, the density of the integration grids, in which currents have to be computed on the reflectors, must be finer and the computational time becomes huge. For an antenna system like Planck, with two reflectors, the computational time increases with the fourth power of the frequency (more than 800 hours to perform a full pattern without shields, at 100 GHz, using a 550 MHz Pentium II machine).

Moreover, the shield contribution is crucial in electromagnetic simulations aimed to define the edge taper of LFI feed horns since shields redistribute the power that is radiated by horns and not reflected by the telescope. Therefore, to predict accurately the pattern, the shields have to be included in the simulations and PO/PTD is not longer applicable.

Multi-Reflector GTD is a ray-optical frequency independent method that could produce in principle accurate results in a reasonable time. Seeing that it is a new simulation method, a good understanding of it in the case of PLANCK is necessary. This is the purpose of the study reported here.

## 2 Parameters of the Planck Telescope and Shields

The Planck Telescope is designed as an off-axis tilted system offering the advantage of an unblocked aperture keeping diffraction due to secondary mirror and supporting structures at very low levels. Both mirrors are ellipsoidal in shape (Aplanatic Configuration), and the conical constants and geometry have been optimized during the *Planck Payload Architech Study*.

Telescope parameters are slightly changed respect to those presented in [1] according to the Telescope mechanical model [2] in order to have both rims (of the primary and secondary mirror) lieing on a plane.

### 2.1 Coordinate Systems

Eight coordinate systems have been defined for representing the telescope in GRASP8. They are listed in Table ???. The origin of each coordinate system and three orientation angles have been written according to the GRASP8 definition [3]. Two coordinate systems defined for representing shields (baffle and the first V-groove) are reported in the last two rows of Table ???. The most significant reference systems are shown in Figure ???. See Figure ?? for a sketch of the system.

Table 1: Definition of coordinate systems used in GRASP8.

| Axis System    | Base      | Location<br>(X <sub>base</sub> ,Y <sub>base</sub> ,Z <sub>base</sub> )<br>[ mm,mm,mm ] |        |            | Orientation<br>(θ,φ,ψ)<br>[ ° ; ° ; ° ] |          |          |
|----------------|-----------|--|--------|------------|---|----------|----------|
| global         | -         | 0.0000   | 0.0000 | 0.0000     | 0.0000                                  | 0.0000   | 0.0000   |
| telescope      | global    | 0.0000   | 0.0000 | 0.0000     | 90.0000                                 | 90.0000  | 0.0000   |
| M1             | telescope | 437.1619   | 0.0000 | -50.0000   | 8.7510                                  | 0.0000   | 0.0000   |
| main_reflector | M1        | 0.0000   | 0.0000 | 745.147    | 37.3461                                 | 180.0000 | 0.0000   |
| M2             | M1        | -84.4800   | 0.0000 | 1180.2980  | 10.1000                                 | 180.0000 | 0.0000   |
| sub_reflector  | M2        | 0.0000   | 0.0000 | -439.8302  | 138.5579                                | 0.0000   | 180.0000 |
| RDP            | M2        | -108.4200  | 0.0000 | -1026.8300 | 21.2700                                 | 180.0000 | 0.0000   |
| aperture       | M1        | 1038.8500  | 0.0000 | 0.0000     | 0.0000                                  | 0.0000   | 0.0000   |
| LOS            | aperture  | 0.0000   | 0.0000 | 0.0000     | 3.7510                                  | 180.0000 | 0.0000   |
| baffle         | telescope | 0.0000   | 0.0000 | 0.0000     | 90.0000                                 | 25.0000  | 115.0000 |
| cone           | telescope | 0.0000   | 0.0000 | 0.0000     | 90.0000                                 | 0.0000   | 0.0000   |

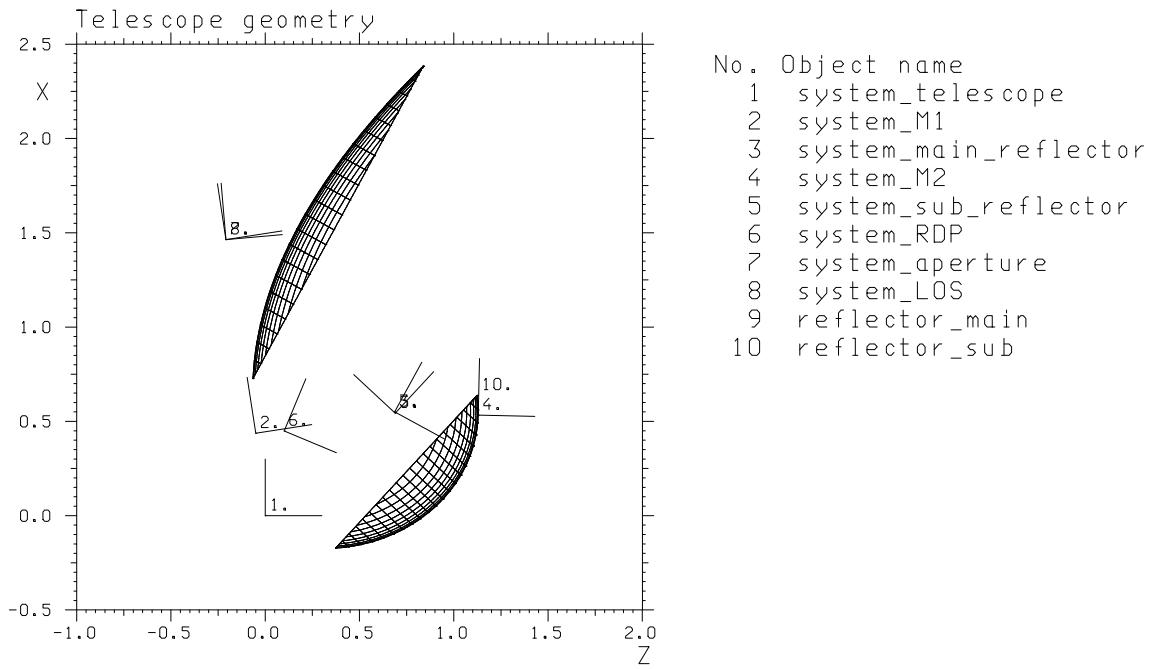


Figure 1: Definition of Planck axis systems.

## 2.2 Telescope parameters

The telescope configuration is reported in Table ?? according to GRASP8 conventions.

Table 2: GRASP8 telescope parameters.

|                  |           |  |
|------------------|-----------|--|
|                  | Rim       | Class Elliptical Rim: rim_main<br><br>centre (x: 738.387 mm; y: 0.00 mm)<br>half axis (x: 943.395 mm; y: 777.990 mm)<br>rotation 0°                  |
| Primary mirror   | Surface   | Class Ellipsoid: surface_main<br><br>vertex distance 22054.938 mm<br>axis angle -37.3461°  |
|                  | Scatterer | Class Reflector: reflector_main<br><br>coordinate system system_main_reflector<br>surface surface_main<br>rim rim_main<br>centre hole radius 0.00 mm |
|                  | Rim       | Class Elliptical Rim: rim_sub<br><br>centre (x: -188.447 mm; y: 0.00 mm)<br>half axis (x: 552.180 mm; y: 525.480 mm)<br>rotation 0°                  |
| Secondary mirror | Surface   | Class Ellipsoid: surface_sub<br><br>vertex distance 1641.58 mm<br>axis angle 41.4421°  |
|                  | Scatterer | Class Reflector: reflector_sub<br><br>coordinate system system_sub_reflector<br>surface surface_sub<br>rim rim_sub<br>centre hole radius 0.00 mm     |

### 2.3 Shields geometry

The blocking structures considered in this preliminary study consist of a baffle and one of the three V-grooves, the first and colder one.

The baffle is defined using a tabulated rim and a regular grid, both specified in two files provided by Alcatel Space Industries.

The V-groove surface is defined by a second order polynomial:  $x^2 + y^2 = A_{zz}z^2$ , in the coordinate system of the V-groove reflector object (*rep-cone* reported in Table ??). The V-groove rim is defined as circular rim, about 3.4 m larger in diameter. The reflector presents a circular hole of about 900 mm of radius, which center coincides with the center of the reflector rim. Nevertheless, this hole is not cut out in Multi-Reflector GTD simulations and the V-groove is considered by GRASP8 as a continuous conical object.

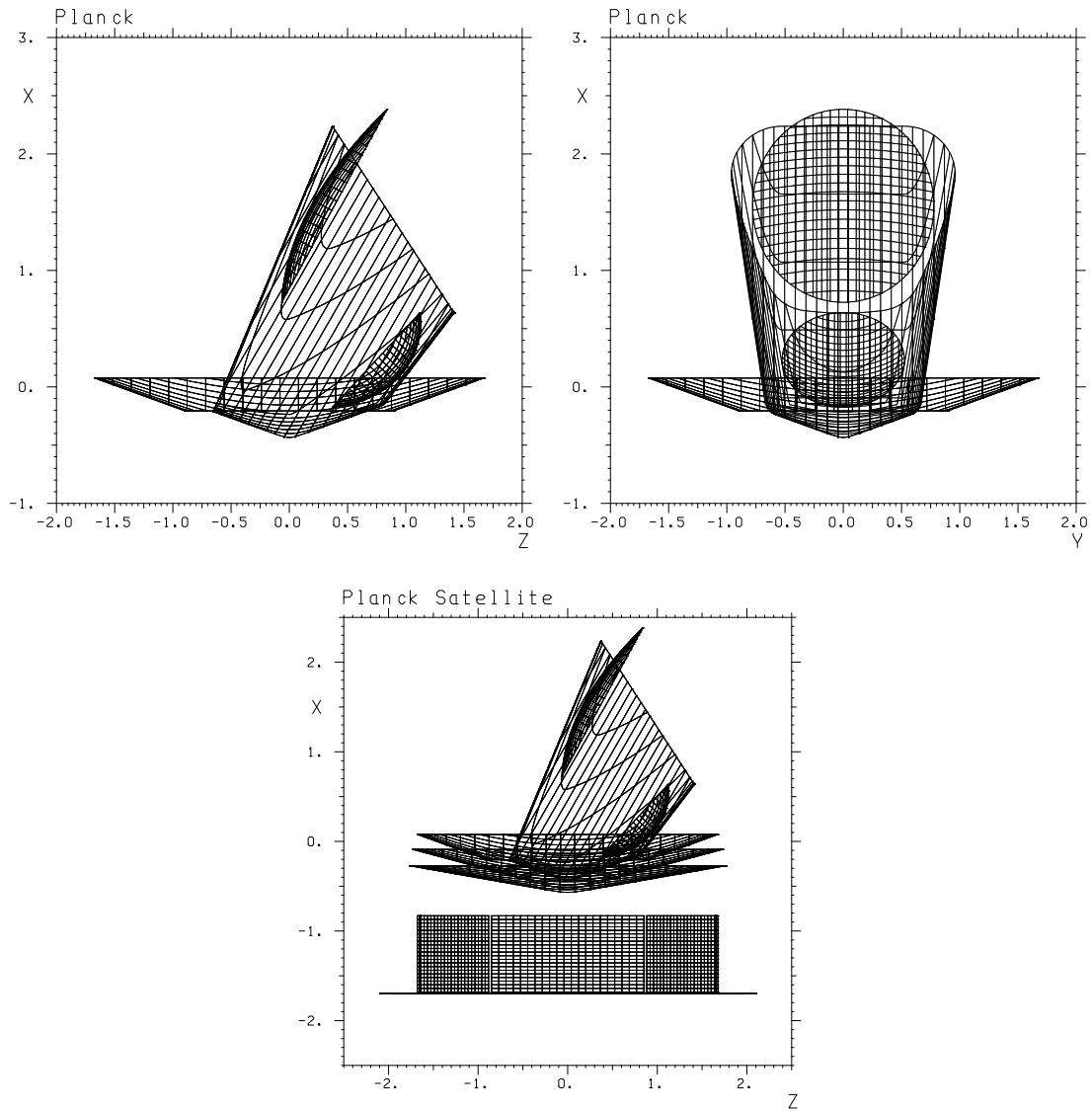


Figure 2: *Top*: telescope and shields geometry in  $(XZ)_{tel}$  and  $(XY)_{tel}$  planes; *Bottom*: telescope and spacecraft geometry.

## 2.4 Focal Plane Unit configuration and Feed locations

The baseline layout of the LFI focal plane foresees 27 corrugated feed horns located around the HFI FPU as reported in Figure ???. In this study our attention is concentrate on the Feed Horn #27, marked with a red circle in Figure ???. The location of this horn, defined in the Reference Detector Plane axis system (RDP), is  $(X_{RDP}, Y_{RDP}, Z_{RDP}) = (-136.95, 54.94, 18.60)$  mm and its orientation is  $(\theta, \varphi, \psi) = (15.56, -23.01, -19.22)$  degrees.

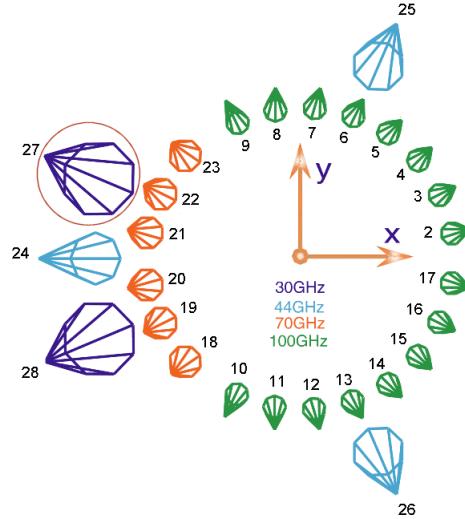


Figure 3: Planck/LFI Focal Plane Unit configuration.

## 3 Feed Modelisation

The feed horn considered in these simulations (30 GHz LFI feed horn #27) is specified by its spherical wave expansion provided by Alcatel Space Industries, since the sub reflector is in the near field of the corrugated horn and near field effects cannot be neglected. Figure ?? shows its far-field radiation pattern.

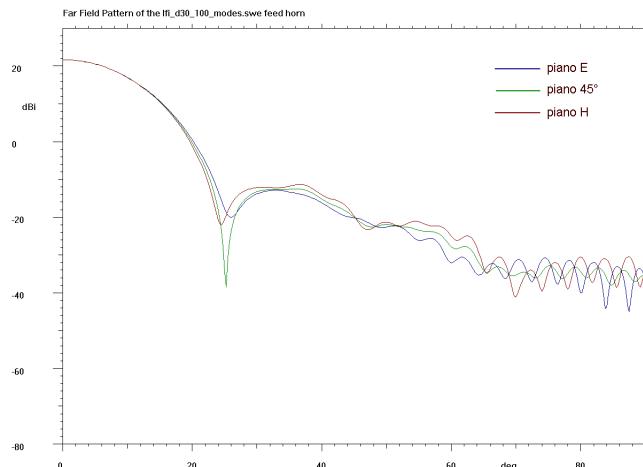


Figure 4: Far-field pattern of the 30 GHz feed horn [ $\varphi = 0^\circ, \varphi = 45^\circ, \varphi = 90^\circ$ ]

## 4 Simulation Methods: Multi–Reflector GTD

At the higher LFI frequencies the reflectors size is hundreds of wavelengths and an approach based on Physical Optics (PO) is not suitable for a full pattern simulation. In addition, simulations that take into account the shield contribution are necessary for the final analysis and a full PO computation of the whole spacecraft geometry would be really too much time consuming and not obviously applicable. For this reason, in our simulations, we used a new GRASP8 add-on package, developed by TICRA [4]. This package, named Multi–Reflector GTD, computes GTD fields from any number of reflectors sequentially illuminated starting at a given source. We specified the geometry of the reflectors as reported in Section ??, the source characteristics as reported in Section ??, the field points in which the radiation pattern has to be computed, and each *contribution* (that is, a bundle of *rays* defined by a sequence of scatterers and by the type of interaction – reflection or diffraction – occurred on each of them) to be taken into account to reach an accurate radiation pattern prediction.

The major problem is to understand the contributions that one should consider, or in other words, to identify the sequence of diffractions and/or reflections on each scatterer which produce a significant power level in the resulting radiation pattern. In fact, the simplest contributions producing significant power levels are reflections on the sub reflector ( $R_s$ ), on the main reflector ( $R_m$ ), and on the baffle ( $R_b$ ), as well as diffractions on the sub reflector ( $D_s$ ), on the main reflector ( $D_m$ ), and on the baffle ( $D_b$ ). Other important contributions can be found considering two interactions with the reflectors (for example, rays reflected on the baffle and then diffracted by the main reflector:  $R_b D_m$ ), three interactions (for example, rays reflected on the sub reflector, diffracted by the main reflector, and then diffracted by the baffle:  $R_s D_m D_b$ ) and so on.

In order to find out the solution of the problem in a rigorous way, we developed a software that automatically produces all possible contributions<sup>2</sup> and computes them using Multi–reflector GTD, in 72 different patches in the sky of  $30^\circ \times 30^\circ$  in which  $\Delta\theta$  and  $\Delta\varphi$  are equal to 2 degrees. These patches are shown in Figure ??.

The program reads the file in which GRASP8 stores the Co–polar and Cross–polar components of each contribution, and it computes the maximum power level in the far field output points. The output data has been stored in 72 ASCII files. Each file reports the contribution considered, the corresponding maximum power level computed, and the computational time<sup>3</sup>. All contributions for each patch are listed in the Appendix ??.

The contributions considered in the final simulation are those in which the maximum power level computed by the program is greater than -50 dBi (-100 dB at 30 GHz)<sup>4</sup>:

1. feed → reflection on sub reflector → far field
2. feed → reflection on main reflector → far field
3. feed → reflection on baffle → far field
4. feed → diffraction on sub reflector → far field
5. feed → diffraction on main reflector → far field
6. feed → diffraction on baffle → far field
7. feed → far field
8. feed → reflection on sub reflector → diffraction on main reflector → far field

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<sup>2</sup>The total number of contributions is  $6^n$ , where  $n$  is the iteration number.

<sup>3</sup>We report CPU time on a single processor, 1 Gb RAM, CPU ALPHA21164, 533 MHz.

<sup>4</sup>The rays reflected on the sub reflector and then reflected on the main reflector ( $R_s R_m$ ) cover the main beam region and we compute the pattern in this region using a full PO analysis.

9. feed → diffraction on sub reflector → reflection on main reflector → far field
10. feed → diffraction on baffle → reflection on main reflector → far field
11. feed → reflection on baffle → diffraction on baffle → far field
12. feed → diffraction on sub reflector → diffraction on main reflector → far field
13. feed → diffraction on baffle → diffraction on main reflector → far field
14. feed → diffraction on sub reflector → diffraction on baffle → far field
15. feed → diffraction on main reflector → reflection on main reflector → far field
16. feed → diffraction on main reflector → diffraction on main reflector → far field
17. feed → diffraction on sub reflector → reflection on baffle → far field
18. feed → reflection on main reflector → diffraction on main reflector → far field
19. feed → reflection on baffle → reflection on main reflector → far field
20. feed → reflection on baffle → diffraction on main reflector → far field
21. feed → reflection on baffle → diffraction on sub reflector → far field
22. feed → reflection on baffle → reflection on sub reflector → far field
23. feed → reflection on main reflector → diffraction on baffle → far field
24. feed → diffraction on main reflector → reflection on baffle → far field
25. feed → reflection on sub reflector → diffraction on baffle → far field
26. feed → diffraction on main reflector → diffraction on baffle → far field
27. feed → reflection on main reflector → reflection on baffle → far field
28. feed → diffraction on sub reflector → diffraction on sub reflector → far field
29. feed → reflection on sub reflector → reflection on baffle → far field
30. feed → diffraction on sub reflector → refletion on sub reflector → far field

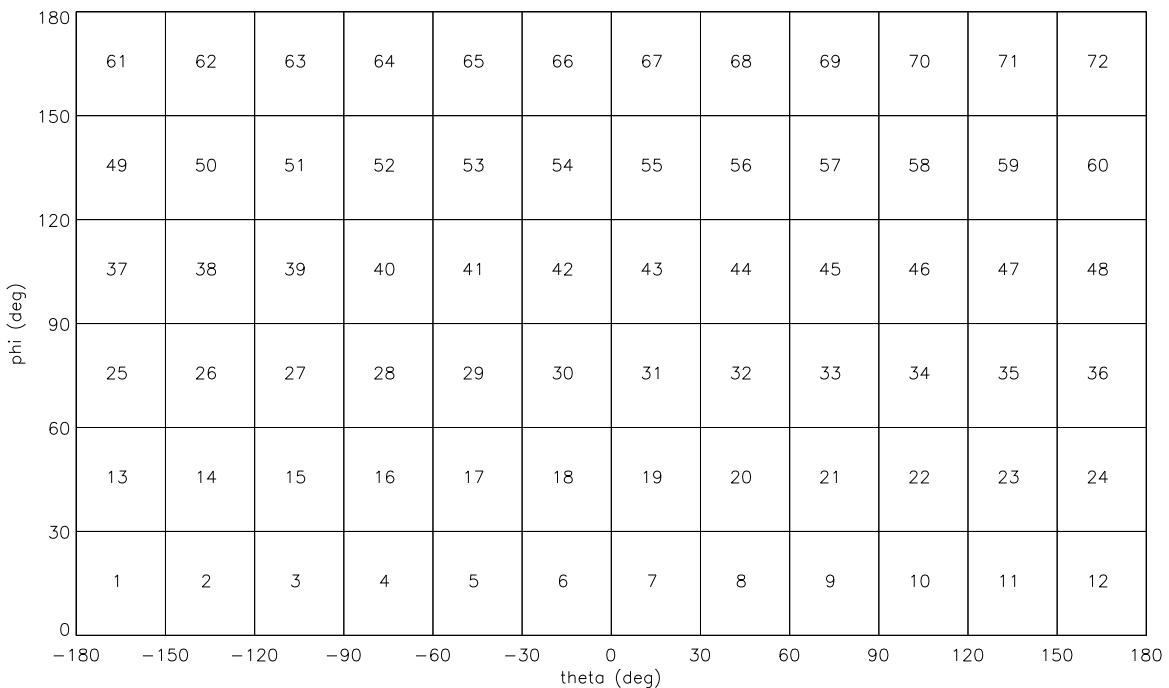


Figure 5: Map and identification numbers of the patches in which the sky has been divided and the far-field computed for each contribution.

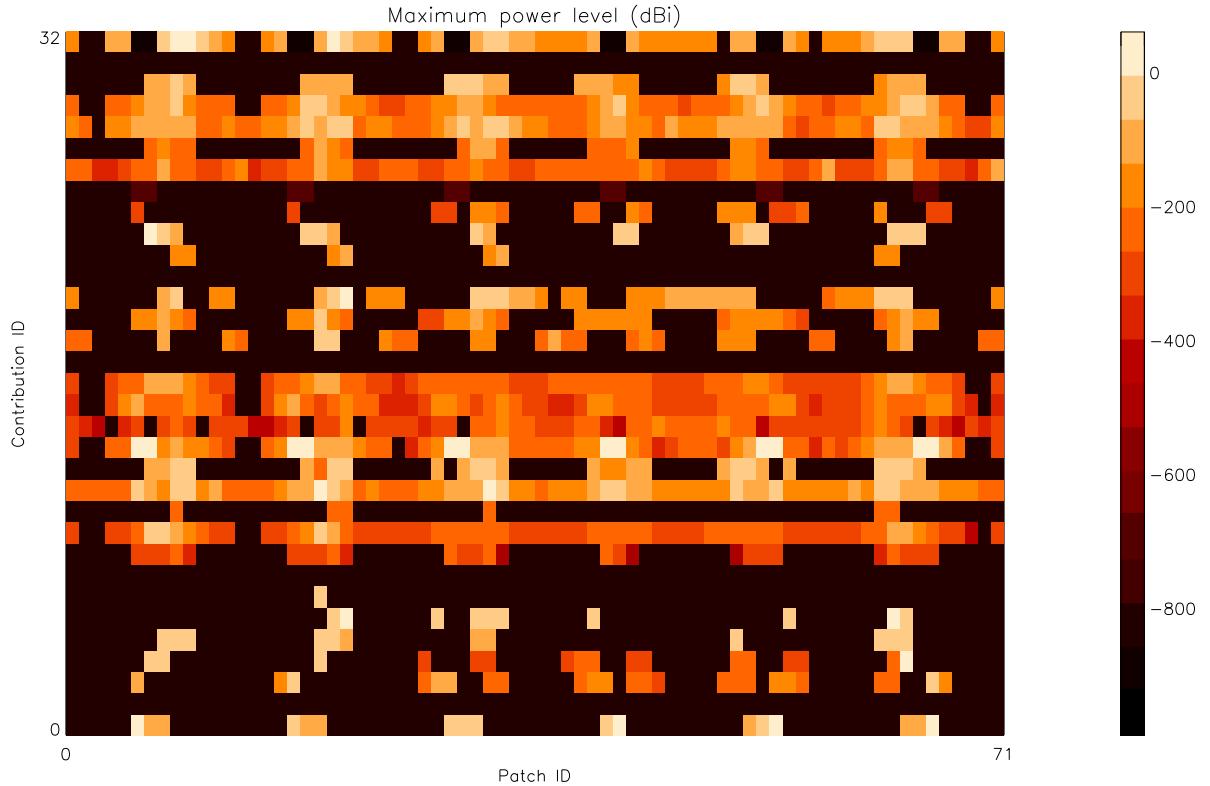


Figure 6: Map of all contributions computed with two interactions: the maximum power level is shown in relation to ID number of the patch and ID number of the contribution, reported in x- and y- axis, respectively. ID number of contributions are: 1) DsRm 2) RmDs 3) DbRm 4) DmRm 5) RbRs 6) RsRb 7) RmRb 8) DbDs 9) DmDs 10) DmDm 11) DmRs 12) RbDb 13) DsRb 14) DsDm 15) DbDb 16) DbDm 17) RmDm 18) DbRs 19) RmDb 20) DmRb 21) RsDb 22) RmRs 23) DsRs 24) RbRm 25) DbRb 26) RsRm 27) DmDb 28) DsDs 29) DsDb 30) RbDm 31) RbDs 32) RsDs 33) RsDm. Contributions with double reflection on the same reflector are not computed by GRASP8.

Blocking structures considered in this preliminary study are the sub reflector, the main reflector, the baffle, and the first V-groove. We have not considered reflections or diffractions on the V-groove because we expect these contributions at very low levels. An accurate estimation of these power levels will be done in future works, as like as an evaluation of higher order contributions.

## 5 Conclusions

In the framework of the PLANCK Low Frequency Instrument optical interface optimization, the shield contribution is crucial in electromagnetical simulations aimed to define the edge taper of each LFI feed horn since shields redistribute the power radiated by horns that is not reflected by the telescope.

GRASP8 Multi-Reflector GTD is an advanced GTD method for evaluating the straylight rejection of the entire optical system, including shields. It computes GTD fields from any number of reflectors sequentially illuminated starting at a given source. Reflector geometry,

source characteristics, and output field points have to be defined, together with each *contribution* (that is, a bundle of *rays* defined by a sequence of scatterers and by the type of interaction – reflection or diffraction – occurred on each of them) to be taken into account to reach an accurate radiation pattern prediction. In order to select *all and only* significant contributions, we developed a software that automatically pick out those contributions for which the maximum power level computed is greater than -50 dBi (-100 dB at 30 GHz).

For the LFI dual profiled feed horn at 30 GHz, ten contributions with two interaction between the reflecting structures have been left out from the final simulation. The resulting contributions considered are thirty in number and the computational time is about few days. We expect that the selection of significant contributions with three interaction between the reflecting structures will be much more restrictive.

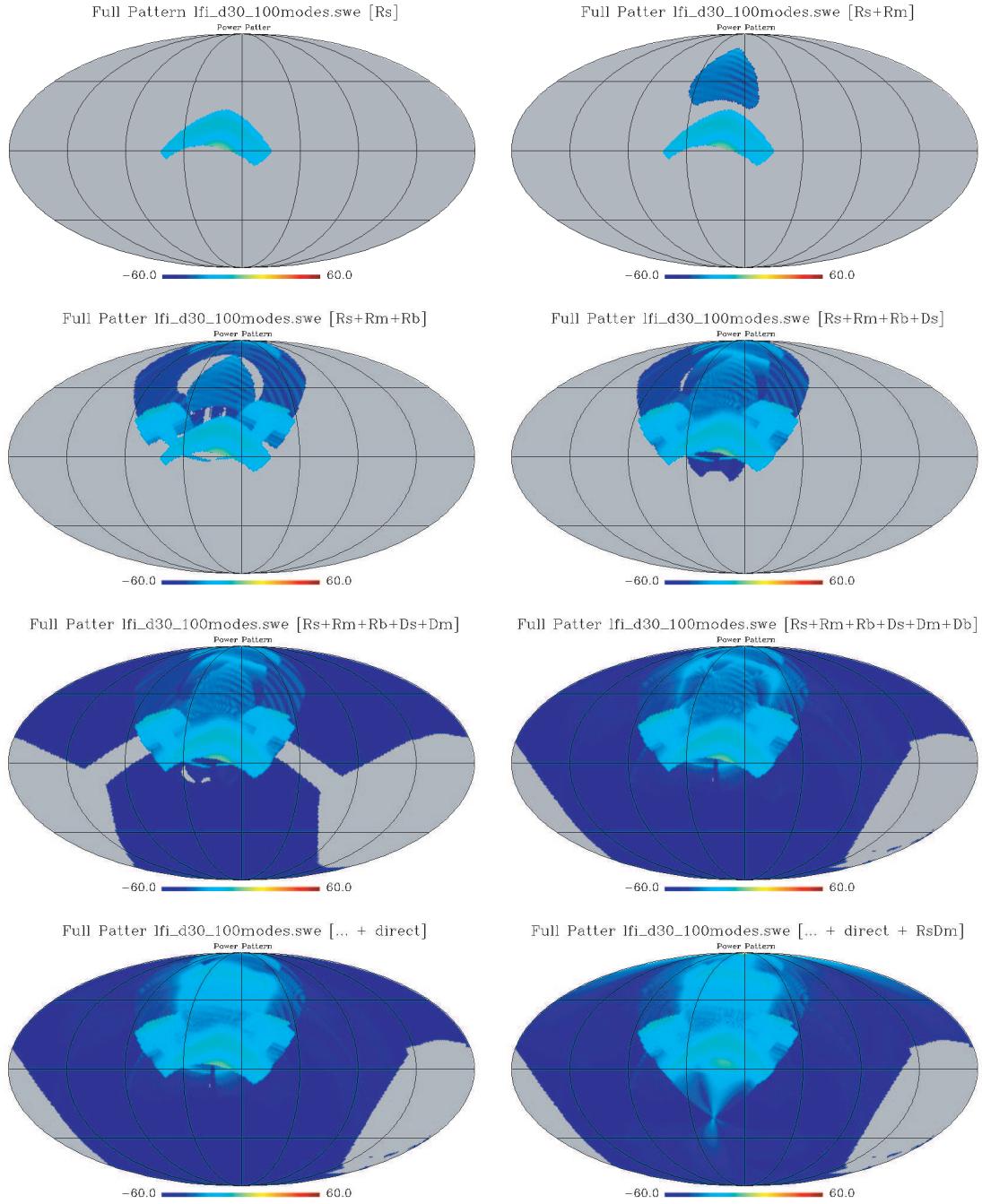
Computational time in the selection procedure of contributions can be considerably reduced using larger  $\Delta\theta$  and  $\Delta\varphi$ , taking care that no contribution is lost. We checked that it comes true using  $\Delta\theta$  and  $\Delta\varphi$  equal to 5 degrees (the corresponding computational time is reduced by a factor four).

## 6 References

1. M.Sandri, F.Villa, M.Bersanelli, N.Mandolesi, *PLANCK/LFI Optical Simulations: on the trade-off between angular resolution and edge taper*, Internal Report ITESRE 308/2001
2. Planck PLM Design Report, HP-3-ASPI-RP-0050
3. Knud Pontoppidan, 1999, *Technical Description of GRASP8*, TICRA. Doc.No.S-894-02
4. Per Nielsen, *Manual for Multi-reflector GTD: an add-on package to GRASP8*, TICRA. Doc.No.S-894-05.

## 7 Appendix 1

In the following figures some contributions are shown ( $\Delta\theta$  and  $\Delta\varphi$  are equal to 0.5 degrees). Each map is computed adding the new contribution at the previous map. It should be noted that: 1) the first contribution due to the rays reflected by the sub reflector and not intercepted by shields, covers the main spillover region raising the power level up to -4 dBi, 2) two *wings* appear at about  $\varphi \simeq 70^\circ$  and  $\varphi \simeq 160^\circ$  ( $\theta \simeq 50^\circ$ ) with a power level up to -2 dBi (see the 3<sup>rd</sup> map), 3) the intermediate main beam region is made dirty by the diffractions on the main reflector (see the 8<sup>th</sup> map).



## 8 Appendix 2

| Contribution patch n.1 | Max Power (dBi) | CT (1 cut) (sec) |
|------------------------|-----------------|------------------|
| RsDm                   | -51.18          | 42               |
| RsDb                   | -52.68          | 69               |
| DsDb                   | -64.68          | 76               |
| DmDb                   | -72.63          | 71               |
| RmDb                   | -74.19          | 59               |
| RbDb                   | -75.12          | 55               |
| RbDm                   | -78.10          | 54               |
| DsDm                   | -81.99          | 39               |
| DbDb                   | -85.11          | 129              |
| RmDm                   | -87.04          | 55               |
| DmDm                   | -93.31          | 24               |
| DbDm                   | -105.79         | 56               |
| DmRm                   | -990.00         | 2                |
| DsDs                   | -990.00         | 35               |
| RsRm                   | -990.00         | 26               |
| RbRm                   | -990.00         | 60               |
| DbRb                   | -990.00         | 131              |
| RbDs                   | -990.00         | 59               |
| RsDs                   | -990.00         | 44               |
| RmDs                   | -990.00         | 21               |
| DbRm                   | -990.00         | 31               |
| DsRm                   | -990.00         | 2                |
| DsRs                   | -990.00         | 36               |
| DbDs                   | -990.00         | 53               |
| RmRb                   | -990.00         | 62               |
| DmDs                   | -990.00         | 30               |
| DmRs                   | -990.00         | 24               |
| DsRb                   | -990.00         | 274              |
| RbRs                   | -990.00         | 109              |
| RmRs                   | -990.00         | 130              |
| DmRb                   | -990.00         | 141              |
| DbRs                   | -990.00         | 49               |
| RsRb                   | -990.00         | 46               |

| Contribution patch n.2 | Max Power (dBi) | CT (1 cut) (sec) |
|------------------------|-----------------|------------------|
| DsDb                   | -66.57          | 61               |
| RbDb                   | -69.54          | 103              |
| DmDb                   | -72.63          | 42               |
| RmDb                   | -75.65          | 24               |
| DbDb                   | -104.86         | 90               |
| DmRb                   | -990.00         | 115              |
| DsRs                   | -990.00         | 22               |
| RmRs                   | -990.00         | 60               |
| RsDb                   | -990.00         | 50               |
| RbRm                   | -990.00         | 46               |
| RbDs                   | -990.00         | 44               |
| RsDs                   | -990.00         | 28               |
| RsDm                   | -990.00         | 29               |
| RbDm                   | -990.00         | 34               |
| DbRb                   | -990.00         | 72               |
| RsRm                   | -990.00         | 31               |
| DsDs                   | -990.00         | 23               |
| DbRs                   | -990.00         | 34               |
| RbRs                   | -990.00         | 98               |
| RsRb                   | -990.00         | 49               |
| RmRb                   | -990.00         | 49               |
| DmRm                   | -990.00         | 36               |
| DsRm                   | -990.00         | 11               |
| RmDs                   | -990.00         | 36               |
| DbRm                   | -990.00         | 55               |
| DbDs                   | -990.00         | 54               |
| DsDm                   | -990.00         | 36               |
| DbDm                   | -990.00         | 31               |
| RmDm                   | -990.00         | 48               |
| DsRb                   | -990.00         | 188              |
| DmDs                   | -990.00         | 35               |
| DmDm                   | -990.00         | 38               |
| DmRs                   | -990.00         | 26               |

| Contribution patch n.3 | Max Power (dBi) | CT (1 cut) (sec) |
|------------------------|-----------------|------------------|
| RbDb                   | -76.41          | 73               |
| DmDb                   | -109.73         | 51               |
| DbDb                   | -121.15         | 64               |
| RbRm                   | -990.00         | 78               |
| DsRs                   | -990.00         | 21               |
| DmRb                   | -990.00         | 88               |
| RmDb                   | -990.00         | 17               |
| RmRs                   | -990.00         | 36               |
| RsDb                   | -990.00         | 43               |
| RbDs                   | -990.00         | 43               |
| RbDm                   | -990.00         | 33               |
| RsDm                   | -990.00         | 28               |
| RsDs                   | -990.00         | 25               |
| RsRm                   | -990.00         | 84               |
| DbRb                   | -990.00         | 69               |
| DsDb                   | -990.00         | 55               |
| DsDs                   | -990.00         | 23               |
| DbRs                   | -990.00         | 31               |
| RbRs                   | -990.00         | 50               |
| RsRb                   | -990.00         | 42               |
| RmRb                   | -990.00         | 39               |
| DmRm                   | -990.00         | 25               |
| DsRm                   | -990.00         | 17               |
| RmDs                   | -990.00         | 19               |
| DbRm                   | -990.00         | 24               |
| DbDs                   | -990.00         | 41               |
| DsDm                   | -990.00         | 22               |
| DbDm                   | -990.00         | 24               |
| RmDm                   | -990.00         | 35               |
| DsRb                   | -990.00         | 113              |
| DmDs                   | -990.00         | 27               |
| DmDm                   | -990.00         | 22               |
| DmRs                   | -990.00         | 13               |

| Contribution patch n.4 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.5 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.6 | Max Power (dBi) | CT (1 cut) (sec) |
|------------------------|-----------------|------------------|------------------------|-----------------|------------------|------------------------|-----------------|------------------|
| RsDm                   | -46.47          | 27               | RsDm                   | -35.72          | 29               | RsRm                   | 65.27           | 102              |
| DsDb                   | -57.11          | 52               | DsDb                   | -56.79          | 43               | RsDm                   | 28.95           | 33               |
| RbDb                   | -71.36          | 69               | BbDm                   | -63.87          | 26               | DsDm                   | -10.10          | 31               |
| RbDm                   | -76.82          | 33               | RbDm                   | -68.86          | 35               | DsRm                   | -14.14          | 55               |
| DsDm                   | -78.93          | 23               | RbDb                   | -69.32          | 63               | RbDb                   | -32.70          | 61               |
| RmDm                   | -84.82          | 43               | DsDm                   | -71.22          | 27               | BbRm                   | -33.81          | 40               |
| BbDm                   | -86.94          | 27               | RmDm                   | -79.78          | 51               | BbDm                   | -43.80          | 27               |
| DmDm                   | -91.48          | 24               | DmDm                   | -86.17          | 30               | DsDb                   | -47.05          | 37               |
| DmDb                   | -98.59          | 53               | DmDb                   | -96.87          | 48               | RbDm                   | -53.18          | 38               |
| RmRs                   | -990.00         | 21               | BbDb                   | -106.55         | 80               | DmRb                   | -64.80          | 56               |
| RsRm                   | -990.00         | 95               | RsRm                   | -990.00         | 96               | RmDm                   | -69.77          | 49               |
| RbRm                   | -990.00         | 87               | DbRb                   | -990.00         | 150              | DmDb                   | -71.79          | 68               |
| DsRs                   | -990.00         | 8                | RmRs                   | -990.00         | 18               | DmDm                   | -76.04          | 26               |
| DbRb                   | -990.00         | 154              | DsRs                   | -990.00         | 2                | DmDs                   | -81.58          | 22               |
| RbDs                   | -990.00         | 43               | RbRm                   | -990.00         | 86               | DbRb                   | -84.78          | 99               |
| RsDs                   | -990.00         | 23               | RbDs                   | -990.00         | 44               | DbDb                   | -90.54          | 170              |
| DsRm                   | -990.00         | 54               | RsDs                   | -990.00         | 21               | DsDs                   | -990.00         | 16               |
| DsDs                   | -990.00         | 25               | DsRm                   | -990.00         | 83               | RsRb                   | -990.00         | 73               |
| DbRm                   | -990.00         | 30               | DsDs                   | -990.00         | 19               | RbRs                   | -990.00         | 78               |
| RmDs                   | -990.00         | 17               | DbRm                   | -990.00         | 72               | RsDs                   | -990.00         | 29               |
| RsDb                   | -990.00         | 39               | RmDs                   | -990.00         | 22               | RmDs                   | -990.00         | 34               |
| DmRs                   | -990.00         | 5                | RmRb                   | -990.00         | 41               | DmRm                   | -990.00         | 16               |
| RsRb                   | -990.00         | 46               | DsRb                   | -990.00         | 65               | RbDs                   | -990.00         | 56               |
| DsRb                   | -990.00         | 152              | RsRb                   | -990.00         | 52               | RbRm                   | -990.00         | 105              |
| RmRb                   | -990.00         | 41               | BbDs                   | -990.00         | 23               | DbDs                   | -990.00         | 26               |
| BbDs                   | -990.00         | 39               | DmDs                   | -990.00         | 25               | DbRs                   | -990.00         | 19               |
| DmDs                   | -990.00         | 25               | DmRs                   | -990.00         | 2                | DmRs                   | -990.00         | 2                |
| BbRs                   | -990.00         | 51               | RmDb                   | -990.00         | 16               | DsRb                   | -990.00         | 42               |
| RmDb                   | -990.00         | 17               | DmRb                   | -990.00         | 38               | RmDb                   | -990.00         | 16               |
| DmRb                   | -990.00         | 54               | RsDb                   | -990.00         | 36               | RsRs                   | -990.00         | 17               |
| RbRs                   | -990.00         | 51               | RbRs                   | -990.00         | 53               | DsRs                   | -990.00         | 2                |
| BbDb                   | -990.00         | 62               | DmRm                   | -990.00         | 15               | RmRb                   | -990.00         | 47               |
| DmRm                   | -990.00         | 20               | DbRs                   | -990.00         | 33               | RsDb                   | -990.00         | 31               |

| Contribution patch n.7 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.8 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.9 | Max Power (dBi) | CT (1 cut) (sec) |
|------------------------|-----------------|------------------|------------------------|-----------------|------------------|------------------------|-----------------|------------------|
| RsRm                   | 65.27           | 104              | DmRm                   | -17.66          | 28               | RsDm                   | -5.59           | 27               |
| RsDm                   | 28.95           | 33               | RbRm                   | -22.16          | 128              | RbDb                   | -21.29          | 175              |
| DsDm                   | -10.10          | 29               | RsDm                   | -27.66          | 29               | RbDm                   | -23.79          | 32               |
| RbRm                   | -13.55          | 117              | RbRs                   | -28.85          | 108              | RbDs                   | -24.33          | 57               |
| DmDm                   | -30.87          | 24               | DmDm                   | -30.87          | 28               | RsDb                   | -25.71          | 74               |
| DmRm                   | -31.90          | 17               | RbDm                   | -34.11          | 33               | DsRb                   | -28.60          | 53               |
| RbDm                   | -33.35          | 31               | RmDm                   | -35.52          | 42               | RbRs                   | -30.24          | 208              |
| RmDm                   | -35.52          | 36               | DsRb                   | -36.05          | 40               | RbRm                   | -34.32          | 77               |
| DsRm                   | -36.81          | 22               | RbDs                   | -36.54          | 65               | DsDb                   | -41.22          | 47               |
| RbDb                   | -39.33          | 75               | DmRb                   | -37.08          | 80               | DmDm                   | -42.56          | 30               |
| RbDs                   | -42.67          | 65               | DmDb                   | -37.63          | 62               | RmDm                   | -43.89          | 43               |
| DsDb                   | -44.69          | 49               | RmDb                   | -39.46          | 35               | DsDm                   | -44.53          | 24               |
| DsRb                   | -47.82          | 59               | RsDb                   | -42.73          | 39               | DmRb                   | -53.41          | 103              |
| DmRb                   | -57.68          | 75               | DsDb                   | -46.67          | 79               | DsRs                   | -55.85          | 29               |
| DsDs                   | -68.44          | 17               | DsRm                   | -47.06          | 24               | DmDb                   | -65.84          | 46               |
| DmDb                   | -79.62          | 41               | DsDs                   | -50.05          | 18               | DsDs                   | -66.19          | 17               |
| DbDm                   | -80.46          | 23               | RbDb                   | -52.83          | 156              | DmRs                   | -71.36          | 19               |
| DmDs                   | -81.58          | 22               | DsDm                   | -52.91          | 24               | DbDm                   | -76.90          | 21               |
| DbRb                   | -990.00         | 49               | DbDm                   | -80.58          | 23               | DmDs                   | -77.67          | 23               |
| RbRs                   | -990.00         | 95               | DmDs                   | -89.97          | 22               | DbDb                   | -80.47          | 136              |
| DbRm                   | -990.00         | 15               | DbDb                   | -91.24          | 105              | DmRm                   | -990.00         | 34               |
| RsDs                   | -990.00         | 37               | RsRm                   | -990.00         | 92               | RsDs                   | -990.00         | 42               |
| RmDs                   | -990.00         | 39               | RsDs                   | -990.00         | 50               | DsRm                   | -990.00         | 11               |
| DbDb                   | -990.00         | 109              | DbDs                   | -990.00         | 23               | DbRm                   | -990.00         | 14               |
| RsRb                   | -990.00         | 91               | RmDs                   | -990.00         | 44               | RmDs                   | -990.00         | 34               |
| RmRb                   | -990.00         | 70               | RsRb                   | -990.00         | 85               | RsRm                   | -990.00         | 41               |
| DbDs                   | -990.00         | 23               | DbRs                   | -990.00         | 13               | RmDb                   | -990.00         | 28               |
| DmRs                   | -990.00         | 9                | DmRs                   | -990.00         | 12               | DbRs                   | -990.00         | 15               |
| RmRs                   | -990.00         | 32               | RmRb                   | -990.00         | 92               | DbDs                   | -990.00         | 21               |
| DsRs                   | -990.00         | 18               | DbRm                   | -990.00         | 15               | RmRb                   | -990.00         | 82               |
| RsDb                   | -990.00         | 33               | DbRb                   | -990.00         | 58               | DbRb                   | -990.00         | 83               |
| DbRs                   | -990.00         | 14               | RmRs                   | -990.00         | 58               | RsRb                   | -990.00         | 72               |
| RmDb                   | -990.00         | 16               | DsRs                   | -990.00         | 22               | RmRs                   | -990.00         | 83               |

| Contribution patch n.10 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.11 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.12 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsDm                    | -9.10           | 29               | RsDm                    | -22.01          | 29               | RbDb                    | -42.60          | 76               |
| DsRb                    | -24.27          | 69               | DsDm                    | -52.39          | 29               | RsDm                    | -44.55          | 28               |
| RbRs                    | -31.41          | 249              | RbDb                    | -55.54          | 103              | RsDb                    | -55.59          | 34               |
| RbDb                    | -31.75          | 100              | RbDm                    | -65.92          | 37               | DsDb                    | -66.47          | 38               |
| DsDb                    | -33.41          | 47               | DsDb                    | -66.96          | 47               | DsDm                    | -72.47          | 26               |
| RbDs                    | -38.19          | 49               | BbDm                    | -69.73          | 28               | RbDm                    | -74.19          | 37               |
| DsDm                    | -50.36          | 25               | RmDm                    | -73.56          | 70               | BbDm                    | -79.30          | 24               |
| RbDm                    | -50.44          | 39               | DmDm                    | -78.56          | 27               | RmDm                    | -82.90          | 60               |
| RmDm                    | -51.90          | 56               | DmDb                    | -93.32          | 39               | BbDb                    | -86.34          | 54               |
| BbDm                    | -54.52          | 30               | BbRb                    | -990.00         | 99               | DmDm                    | -89.24          | 31               |
| DsRs                    | -55.68          | 25               | RsRm                    | -990.00         | 17               | DmDb                    | -94.55          | 48               |
| DmDm                    | -57.08          | 26               | RmRs                    | -990.00         | 95               | RsRm                    | -990.00         | 18               |
| DmDb                    | -67.21          | 40               | DsRs                    | -990.00         | 24               | BbRb                    | -990.00         | 90               |
| DmRb                    | -72.53          | 96               | RbRm                    | -990.00         | 46               | DsRs                    | -990.00         | 29               |
| DsDs                    | -73.66          | 16               | RbDs                    | -990.00         | 41               | RbRm                    | -990.00         | 43               |
| BbDb                    | -81.71          | 169              | RsDs                    | -990.00         | 24               | DsDs                    | -990.00         | 24               |
| DmDs                    | -97.06          | 23               | DsRm                    | -990.00         | 2                | RbDs                    | -990.00         | 41               |
| BbRb                    | -990.00         | 82               | DsDs                    | -990.00         | 17               | RsDs                    | -990.00         | 32               |
| RsRm                    | -990.00         | 17               | BbRm                    | -990.00         | 20               | RmDs                    | -990.00         | 17               |
| RsDs                    | -990.00         | 30               | RmDs                    | -990.00         | 22               | DsRm                    | -990.00         | 2                |
| DsRm                    | -990.00         | 2                | RsDb                    | -990.00         | 29               | BbRm                    | -990.00         | 23               |
| RmDs                    | -990.00         | 27               | RmRb                    | -990.00         | 74               | RsRm                    | -990.00         | 94               |
| DmRm                    | -990.00         | 2                | DsRb                    | -990.00         | 71               | DsRb                    | -990.00         | 103              |
| BbRm                    | -990.00         | 14               | RsRb                    | -990.00         | 73               | RmRb                    | -990.00         | 65               |
| RmRb                    | -990.00         | 75               | BbDs                    | -990.00         | 24               | DsDs                    | -990.00         | 47               |
| RsRb                    | -990.00         | 82               | DmDs                    | -990.00         | 24               | DmDs                    | -990.00         | 24               |
| DmRs                    | -990.00         | 25               | DmRs                    | -990.00         | 28               | DmRs                    | -990.00         | 28               |
| BbDs                    | -990.00         | 22               | BbRs                    | -990.00         | 49               | RsRb                    | -990.00         | 62               |
| BbRs                    | -990.00         | 38               | RmDb                    | -990.00         | 17               | DmRb                    | -990.00         | 98               |
| RmRs                    | -990.00         | 94               | DmRb                    | -990.00         | 101              | DmRm                    | -990.00         | 2                |
| RbRm                    | -990.00         | 56               | BbDb                    | -990.00         | 115              | RmDb                    | -990.00         | 18               |
| RmDb                    | -990.00         | 17               | RbRs                    | -990.00         | 213              | RbRs                    | -990.00         | 144              |
| RsDb                    | -990.00         | 90               | DmRm                    | -990.00         | 2                | DbRs                    | -990.00         | 98               |

| Contribution patch n.13 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.14 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.15 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsDm                    | -51.18          | 28               | DmDb                    | -62.02          | 65               | RbDb                    | -68.51          | 91               |
| RsDb                    | -52.46          | 53               | RmDb                    | -75.30          | 23               | DsDb                    | -73.20          | 62               |
| RmDb                    | -61.53          | 42               | RbDb                    | -76.48          | 83               | DmDb                    | -102.66         | 60               |
| DsDb                    | -64.64          | 54               | DsDb                    | -80.36          | 65               | DbDb                    | -115.83         | 67               |
| DmDb                    | -66.74          | 69               | DbDb                    | -92.75          | 54               | RmDb                    | -990.00         | 18               |
| RbDb                    | -72.56          | 64               | DmRb                    | -990.00         | 116              | DsRs                    | -990.00         | 25               |
| RbDm                    | -78.41          | 33               | DsRs                    | -990.00         | 25               | RsDb                    | -990.00         | 48               |
| DsDm                    | -81.28          | 25               | RmRs                    | -990.00         | 59               | DmRb                    | -990.00         | 115              |
| DbDb                    | -84.03          | 62               | RsDb                    | -990.00         | 49               | RmRs                    | -990.00         | 37               |
| RmDm                    | -87.04          | 35               | RbRm                    | -990.00         | 46               | RbRm                    | -990.00         | 78               |
| DmDm                    | -93.31          | 23               | RbDs                    | -990.00         | 38               | RbDs                    | -990.00         | 38               |
| DbDm                    | -105.79         | 26               | RsDs                    | -990.00         | 25               | RsDs                    | -990.00         | 23               |
| DmRm                    | -990.00         | 2                | RsDm                    | -990.00         | 30               | RsDm                    | -990.00         | 29               |
| DsDs                    | -990.00         | 23               | RbDm                    | -990.00         | 30               | RbDm                    | -990.00         | 29               |
| RsRm                    | -990.00         | 17               | DbRb                    | -990.00         | 69               | DbRb                    | -990.00         | 127              |
| RbRm                    | -990.00         | 39               | RsRm                    | -990.00         | 30               | RsRm                    | -990.00         | 81               |
| DbRb                    | -990.00         | 95               | DsDs                    | -990.00         | 23               | DsDs                    | -990.00         | 23               |
| RbDs                    | -990.00         | 40               | DbRs                    | -990.00         | 27               | DbRs                    | -990.00         | 26               |
| RsDs                    | -990.00         | 33               | RbRs                    | -990.00         | 67               | RbRs                    | -990.00         | 51               |
| RmDs                    | -990.00         | 19               | RsRb                    | -990.00         | 36               | RsRb                    | -990.00         | 45               |
| DbRm                    | -990.00         | 29               | RmRb                    | -990.00         | 36               | RmRb                    | -990.00         | 41               |
| DsRm                    | -990.00         | 2                | DmRm                    | -990.00         | 14               | DmRm                    | -990.00         | 23               |
| DsRs                    | -990.00         | 23               | DsRm                    | -990.00         | 7                | DsRm                    | -990.00         | 16               |
| DbDs                    | -990.00         | 45               | RmDs                    | -990.00         | 17               | RmDs                    | -990.00         | 17               |
| RmRb                    | -990.00         | 45               | DbRm                    | -990.00         | 35               | DbRm                    | -990.00         | 24               |
| DmDs                    | -990.00         | 29               | DbDs                    | -990.00         | 40               | DbDs                    | -990.00         | 42               |
| DmRs                    | -990.00         | 24               | DsDm                    | -990.00         | 23               | DsDm                    | -990.00         | 23               |
| DsRb                    | -990.00         | 172              | DbDm                    | -990.00         | 25               | DbDm                    | -990.00         | 26               |
| RbRs                    | -990.00         | 105              | RmDm                    | -990.00         | 33               | RmDm                    | -990.00         | 35               |
| RmRs                    | -990.00         | 84               | DsRb                    | -990.00         | 175              | DsRb                    | -990.00         | 202              |
| DmRb                    | -990.00         | 123              | DmDs                    | -990.00         | 23               | DmDs                    | -990.00         | 23               |
| DbRs                    | -990.00         | 38               | DmDm                    | -990.00         | 22               | DmDm                    | -990.00         | 22               |
| RsRb                    | -990.00         | 44               | DmRs                    | -990.00         | 17               | DmRs                    | -990.00         | 12               |

| Contribution patch n.16 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -49.16          | 27               |
| DsDb                    | -61.15          | 55               |
| RbDb                    | -68.26          | 87               |
| RbDm                    | -72.49          | 32               |
| DsDm                    | -72.78          | 24               |
| DbDm                    | -84.15          | 27               |
| RmDm                    | -85.74          | 43               |
| DmDm                    | -87.54          | 24               |
| DmDb                    | -93.67          | 68               |
| DbDb                    | -118.45         | 78               |
| RsRm                    | -990.00         | 94               |
| DbRb                    | -990.00         | 104              |
| RmRs                    | -990.00         | 21               |
| DsRs                    | -990.00         | 10               |
| RbRm                    | -990.00         | 86               |
| RbDs                    | -990.00         | 37               |
| RsDs                    | -990.00         | 22               |
| DsRm                    | -990.00         | 36               |
| DsDs                    | -990.00         | 23               |
| DbRm                    | -990.00         | 34               |
| RmDs                    | -990.00         | 17               |
| RmRb                    | -990.00         | 43               |
| DsRb                    | -990.00         | 170              |
| RsRb                    | -990.00         | 49               |
| DbDs                    | -990.00         | 38               |
| DmDs                    | -990.00         | 21               |
| DmRs                    | -990.00         | 5                |
| RmDb                    | -990.00         | 18               |
| DmRb                    | -990.00         | 67               |
| RsDb                    | -990.00         | 43               |
| RbRs                    | -990.00         | 49               |
| DmRm                    | -990.00         | 20               |
| DbRs                    | -990.00         | 27               |

| Contribution patch n.17 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -40.46          | 27               |
| DbRm                    | -56.69          | 73               |
| DsDb                    | -61.15          | 45               |
| RbDb                    | -62.32          | 78               |
| DbDm                    | -63.00          | 28               |
| DsDm                    | -64.57          | 25               |
| RbDm                    | -71.91          | 33               |
| RmDm                    | -80.06          | 59               |
| DmDm                    | -83.93          | 31               |
| DmDb                    | -86.44          | 55               |
| DbDb                    | -107.60         | 77               |
| RsRm                    | -990.00         | 97               |
| DsRm                    | -990.00         | 58               |
| DbRb                    | -990.00         | 174              |
| DsRs                    | -990.00         | 2                |
| RbRm                    | -990.00         | 86               |
| RmDs                    | -990.00         | 23               |
| RbDs                    | -990.00         | 38               |
| DmRm                    | -990.00         | 16               |
| DsDs                    | -990.00         | 18               |
| RsDs                    | -990.00         | 22               |
| RmRs                    | -990.00         | 17               |
| DsRb                    | -990.00         | 71               |
| RmRb                    | -990.00         | 44               |
| DbDs                    | -990.00         | 22               |
| DmDs                    | -990.00         | 24               |
| DmRs                    | -990.00         | 2                |
| RsRb                    | -990.00         | 63               |
| DmRb                    | -990.00         | 41               |
| RsDb                    | -990.00         | 40               |
| RmRb                    | -990.00         | 18               |
| RbRs                    | -990.00         | 60               |
| DbRs                    | -990.00         | 20               |

| Contribution patch n.18 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 103              |
| RsDm                    | 28.95           | 32               |
| DsDm                    | -10.10          | 30               |
| DsRm                    | -19.66          | 37               |
| DbRm                    | -28.69          | 41               |
| RbDb                    | -45.60          | 57               |
| DsDb                    | -47.05          | 34               |
| DbDm                    | -47.80          | 27               |
| RbDm                    | -53.40          | 37               |
| DmRb                    | -64.80          | 48               |
| DmDb                    | -69.45          | 63               |
| RmDm                    | -69.77          | 64               |
| DmDm                    | -76.04          | 25               |
| DmDs                    | -81.58          | 22               |
| DbRb                    | -85.59          | 88               |
| DbDb                    | -91.40          | 108              |
| DsDs                    | -990.00         | 16               |
| RsRb                    | -990.00         | 76               |
| RmRb                    | -990.00         | 47               |
| RbRs                    | -990.00         | 89               |
| RsDs                    | -990.00         | 31               |
| RmDs                    | -990.00         | 33               |
| DmRm                    | -990.00         | 15               |
| RbDs                    | -990.00         | 57               |
| DbRs                    | -990.00         | 17               |
| RmDb                    | -990.00         | 16               |
| DsRb                    | -990.00         | 40               |
| DmRs                    | -990.00         | 2                |
| DbDs                    | -990.00         | 22               |
| DsRs                    | -990.00         | 2                |
| RbRm                    | -990.00         | 101              |
| RsDb                    | -990.00         | 34               |
| RmRs                    | -990.00         | 17               |

| Contribution patch n.19 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.20 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.21 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 103              | RbDb                    | -11.34          | 150              | RsDm                    | -15.85          | 27               |
| RsDm                    | 28.95           | 33               | RbRm                    | -17.88          | 115              | RsRb                    | -20.12          | 71               |
| DsDm                    | -10.10          | 28               | DmRm                    | -23.35          | 28               | RsDb                    | -26.09          | 68               |
| RbRm                    | -17.88          | 131              | RbDm                    | -23.61          | 42               | RbRs                    | -29.48          | 146              |
| RbDm                    | -25.63          | 44               | RbRs                    | -28.07          | 112              | DsDb                    | -29.52          | 63               |
| DsDb                    | -31.99          | 106              | DmDm                    | -30.10          | 34               | RbDb                    | -30.67          | 163              |
| DsRm                    | -33.54          | 22               | DmRb                    | -31.77          | 82               | DsRb                    | -30.84          | 55               |
| RbDs                    | -38.76          | 65               | RmDb                    | -32.34          | 35               | RmDb                    | -32.34          | 39               |
| RbDb                    | -38.86          | 113              | RmRb                    | -32.61          | 86               | DsDm                    | -33.32          | 24               |
| DsRb                    | -47.36          | 79               | RsDb                    | -35.16          | 107              | RbDm                    | -36.53          | 40               |
| DmRb                    | -56.72          | 85               | RsDm                    | -35.77          | 28               | DmDm                    | -36.88          | 34               |
| RmDm                    | -60.60          | 34               | RmDm                    | -36.39          | 49               | RmDm                    | -39.20          | 59               |
| DmDm                    | -62.94          | 26               | RbDs                    | -36.54          | 50               | RbDs                    | -42.29          | 47               |
| DsDs                    | -67.52          | 17               | DsDm                    | -39.92          | 25               | RbRm                    | -42.75          | 83               |
| DmDb                    | -77.58          | 49               | DsDb                    | -39.97          | 84               | DsRs                    | -49.24          | 24               |
| DbDm                    | -78.66          | 33               | DsRm                    | -40.00          | 21               | DmDb                    | -53.50          | 54               |
| DmDs                    | -81.58          | 22               | DmDb                    | -46.87          | 77               | DmRb                    | -57.94          | 89               |
| DbRb                    | -990.00         | 71               | DsDs                    | -48.14          | 21               | DsDs                    | -61.95          | 20               |
| RsRb                    | -990.00         | 96               | DsRb                    | -72.58          | 67               | DmRs                    | -71.04          | 19               |
| RbRs                    | -990.00         | 93               | DbDm                    | -83.50          | 34               | DmDs                    | -76.99          | 23               |
| RsDs                    | -990.00         | 44               | DmDs                    | -90.48          | 23               | DbDm                    | -78.20          | 35               |
| RmDs                    | -990.00         | 37               | DbDb                    | -91.55          | 135              | DbDb                    | -81.00          | 137              |
| DmRm                    | -990.00         | 16               | RsRm                    | -990.00         | 89               | DbRm                    | -990.00         | 14               |
| DbRm                    | -990.00         | 14               | RmDs                    | -990.00         | 28               | DbDs                    | -990.00         | 17               |
| DbRs                    | -990.00         | 15               | RsDs                    | -990.00         | 64               | RmDs                    | -990.00         | 25               |
| RmDb                    | -990.00         | 17               | DbDs                    | -990.00         | 18               | RsDs                    | -990.00         | 43               |
| DmRs                    | -990.00         | 8                | RsRb                    | -990.00         | 84               | DsRm                    | -990.00         | 16               |
| DbDb                    | -990.00         | 135              | DmRs                    | -990.00         | 12               | RmRb                    | -990.00         | 77               |
| DbDs                    | -990.00         | 19               | DbRs                    | -990.00         | 13               | RmRs                    | -990.00         | 80               |
| DsRs                    | -990.00         | 22               | DbRm                    | -990.00         | 15               | DmRm                    | -990.00         | 27               |
| RmRb                    | -990.00         | 75               | DbRb                    | -990.00         | 47               | DbRs                    | -990.00         | 15               |
| RsDb                    | -990.00         | 32               | RmRs                    | -990.00         | 56               | RsRm                    | -990.00         | 44               |
| RmRs                    | -990.00         | 31               | DsRs                    | -990.00         | 22               | DbRb                    | -990.00         | 74               |

| Contribution patch n.22 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsRb                    | -10.45          | 76               |
| RsDb                    | -16.50          | 61               |
| DsRb                    | -18.22          | 70               |
| RsDm                    | -20.78          | 29               |
| DsDb                    | -21.89          | 49               |
| DsDm                    | -33.32          | 27               |
| RbRs                    | -36.78          | 196              |
| RbDb                    | -37.58          | 119              |
| RbDs                    | -45.00          | 41               |
| DsRs                    | -47.78          | 24               |
| RbDm                    | -52.51          | 45               |
| DbDb                    | -55.94          | 164              |
| DbDm                    | -56.48          | 32               |
| DmDb                    | -64.97          | 40               |
| RmDm                    | -65.89          | 52               |
| DmDm                    | -69.11          | 32               |
| DmRb                    | -71.55          | 96               |
| DmRs                    | -72.02          | 24               |
| DsDs                    | -78.06          | 18               |
| DmDs                    | -100.82         | 22               |
| DmRm                    | -990.00         | 2                |
| DsRm                    | -990.00         | 2                |
| RmRb                    | -990.00         | 70               |
| RsDs                    | -990.00         | 20               |
| RmDs                    | -990.00         | 23               |
| DbRm                    | -990.00         | 16               |
| RmRs                    | -990.00         | 94               |
| RmDb                    | -990.00         | 17               |
| DbRs                    | -990.00         | 34               |
| DbDs                    | -990.00         | 19               |
| RsRm                    | -990.00         | 17               |
| DbRb                    | -990.00         | 80               |
| RbRm                    | -990.00         | 55               |

| Contribution patch n.23 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -33.40          | 28               |
| DsDm                    | -54.05          | 29               |
| RbDm                    | -64.20          | 41               |
| DsDb                    | -69.29          | 50               |
| DbDm                    | -70.33          | 31               |
| RmDm                    | -77.81          | 42               |
| RbDb                    | -78.57          | 117              |
| DmDm                    | -82.47          | 29               |
| DmDb                    | -85.72          | 37               |
| RmRs                    | -990.00         | 95               |
| RsRm                    | -990.00         | 17               |
| RbRm                    | -990.00         | 48               |
| DsRs                    | -990.00         | 28               |
| DbRb                    | -990.00         | 82               |
| RbDs                    | -990.00         | 43               |
| RsDs                    | -990.00         | 18               |
| DsRm                    | -990.00         | 2                |
| DsDs                    | -990.00         | 21               |
| DbRm                    | -990.00         | 21               |
| RmDs                    | -990.00         | 20               |
| RsDb                    | -990.00         | 29               |
| DmRs                    | -990.00         | 27               |
| DsRb                    | -990.00         | 68               |
| RsRb                    | -990.00         | 68               |
| RmRb                    | -990.00         | 72               |
| DbDs                    | -990.00         | 23               |
| DmDs                    | -990.00         | 23               |
| DbRs                    | -990.00         | 42               |
| RmDb                    | -990.00         | 17               |
| DmRb                    | -990.00         | 100              |
| DbDb                    | -990.00         | 130              |
| RbRs                    | -990.00         | 194              |
| DmRm                    | -990.00         | 2                |

| Contribution patch n.24 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -44.18          | 28               |
| RsDb                    | -53.24          | 39               |
| RbDb                    | -55.58          | 83               |
| DsDb                    | -63.05          | 39               |
| RbDm                    | -73.40          | 36               |
| DsDm                    | -77.32          | 27               |
| DbDm                    | -79.51          | 26               |
| DbDb                    | -81.83          | 99               |
| RmDm                    | -82.88          | 54               |
| DmDm                    | -89.74          | 29               |
| DmDb                    | -94.55          | 48               |
| RsRm                    | -990.00         | 17               |
| DbRb                    | -990.00         | 84               |
| DsRs                    | -990.00         | 30               |
| RbRm                    | -990.00         | 43               |
| DsDs                    | -990.00         | 24               |
| RsDs                    | -990.00         | 24               |
| DsRm                    | -990.00         | 2                |
| RbDs                    | -990.00         | 44               |
| DbRm                    | -990.00         | 22               |
| RmDs                    | -990.00         | 17               |
| RmRs                    | -990.00         | 94               |
| DbDs                    | -990.00         | 40               |
| RmRb                    | -990.00         | 63               |
| DsRb                    | -990.00         | 95               |
| DmRs                    | -990.00         | 28               |
| DmDs                    | -990.00         | 24               |
| RsRb                    | -990.00         | 60               |
| DmRb                    | -990.00         | 83               |
| DmRm                    | -990.00         | 2                |
| RmDb                    | -990.00         | 19               |
| RbRs                    | -990.00         | 142              |
| DbRs                    | -990.00         | 42               |

| Contribution patch n.25 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.26 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.27 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsDm                    | -51.18          | 27               | RsDb                    | -60.46          | 32               | RbDb                    | -65.96          | 87               |
| RsDb                    | -52.44          | 51               | RmDb                    | -66.48          | 41               | DmDb                    | -72.93          | 85               |
| DsDb                    | -64.40          | 53               | RbDb                    | -70.42          | 76               | DsDb                    | -73.20          | 54               |
| RmDb                    | -64.63          | 38               | DmDb                    | -71.05          | 59               | RmDb                    | -74.01          | 19               |
| RbDb                    | -65.80          | 98               | DsDb                    | -71.56          | 63               | RbDm                    | -75.29          | 34               |
| DmDb                    | -70.52          | 80               | RbDm                    | -81.20          | 31               | RmDm                    | -82.17          | 57               |
| DsDm                    | -78.45          | 24               | DbDb                    | -91.53          | 73               | DmDm                    | -86.44          | 21               |
| RbDm                    | -81.89          | 32               | DmDm                    | -92.77          | 22               | DbDb                    | -96.96          | 64               |
| DbDb                    | -84.17          | 55               | RmDm                    | -97.07          | 51               | DsDm                    | -103.51         | 23               |
| RmDm                    | -87.04          | 41               | DbDm                    | -109.62         | 30               | DbDm                    | -106.87         | 30               |
| DmDm                    | -91.80          | 24               | RsRm                    | -990.00         | 24               | RsRm                    | -990.00         | 68               |
| DbDm                    | -105.79         | 26               | DbRm                    | -990.00         | 38               | DbRm                    | -990.00         | 25               |
| DmRm                    | -990.00         | 2                | DsRs                    | -990.00         | 26               | DsRs                    | -990.00         | 23               |
| DsDs                    | -990.00         | 23               | RbRm                    | -990.00         | 42               | RbRm                    | -990.00         | 70               |
| RsRm                    | -990.00         | 18               | DbRb                    | -990.00         | 110              | DbRb                    | -990.00         | 101              |
| RbRm                    | -990.00         | 38               | RbDs                    | -990.00         | 37               | RmDs                    | -990.00         | 17               |
| DbRb                    | -990.00         | 106              | RsDs                    | -990.00         | 16               | DsRm                    | -990.00         | 16               |
| RbDs                    | -990.00         | 40               | RsDm                    | -990.00         | 27               | RbDs                    | -990.00         | 36               |
| RsDs                    | -990.00         | 26               | DsDs                    | -990.00         | 23               | RsDm                    | -990.00         | 27               |
| RmDs                    | -990.00         | 17               | RmDs                    | -990.00         | 17               | RsDs                    | -990.00         | 16               |
| DbRm                    | -990.00         | 28               | DsRm                    | -990.00         | 5                | DsDs                    | -990.00         | 23               |
| DsRm                    | -990.00         | 2                | RmRs                    | -990.00         | 67               | RmRs                    | -990.00         | 46               |
| DsRs                    | -990.00         | 23               | DsRb                    | -990.00         | 150              | DmRs                    | -990.00         | 11               |
| DbDs                    | -990.00         | 40               | DsDm                    | -990.00         | 22               | RsRb                    | -990.00         | 44               |
| RmRb                    | -990.00         | 47               | DbDs                    | -990.00         | 34               | DmDs                    | -990.00         | 21               |
| DmDs                    | -990.00         | 27               | DmDs                    | -990.00         | 21               | RmRb                    | -990.00         | 40               |
| DmRs                    | -990.00         | 25               | DmRs                    | -990.00         | 17               | DbDs                    | -990.00         | 32               |
| DsRb                    | -990.00         | 137              | RmRb                    | -990.00         | 38               | DsRb                    | -990.00         | 108              |
| RbRs                    | -990.00         | 115              | DmRb                    | -990.00         | 97               | DmRb                    | -990.00         | 91               |
| RmRs                    | -990.00         | 86               | DmRm                    | -990.00         | 9                | RsDb                    | -990.00         | 36               |
| DmRb                    | -990.00         | 88               | RbRs                    | -990.00         | 71               | DmRm                    | -990.00         | 25               |
| DbRs                    | -990.00         | 42               | RsRb                    | -990.00         | 38               | RbRs                    | -990.00         | 57               |
| RsRb                    | -990.00         | 44               | DbRs                    | -990.00         | 33               | DbRs                    | -990.00         | 25               |

| Contribution patch n.28 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.29 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.30 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsDm                    | -50.82          | 26               | RsRb                    | -32.82          | 95               | RsRm                    | 65.27           | 103              |
| RbDb                    | -54.50          | 99               | DsRb                    | -37.35          | 143              | RsDm                    | 28.95           | 32               |
| DsDb                    | -65.81          | 49               | DbRm                    | -37.56          | 56               | DsDm                    | -10.10          | 30               |
| DsDm                    | -67.04          | 22               | RsDm                    | -43.57          | 26               | DsRm                    | -17.74          | 33               |
| DbRm                    | -71.73          | 51               | RbDb                    | -55.91          | 94               | RbDs                    | -32.45          | 52               |
| RbDm                    | -72.04          | 36               | DsDb                    | -57.13          | 50               | DbRm                    | -36.94          | 36               |
| RmDm                    | -78.16          | 59               | DsDm                    | -59.07          | 25               | RbDb                    | -39.78          | 71               |
| DmRb                    | -81.93          | 66               | RbDm                    | -64.75          | 38               | DsDb                    | -47.05          | 37               |
| DmDm                    | -82.56          | 22               | DbDm                    | -64.78          | 37               | RbDm                    | -54.44          | 37               |
| DmRm                    | -85.14          | 20               | RmDm                    | -74.76          | 82               | DbDm                    | -57.86          | 29               |
| DbDm                    | -85.95          | 31               | DmDm                    | -78.80          | 31               | DmRb                    | -64.55          | 76               |
| DmDb                    | -87.22          | 75               | DbRb                    | -88.47          | 165              | DmDb                    | -68.16          | 69               |
| DbDb                    | -103.05         | 87               | DmRb                    | -90.77          | 61               | RmDm                    | -69.54          | 80               |
| DbRb                    | -990.00         | 146              | DmDb                    | -93.72          | 79               | DmDm                    | -75.64          | 25               |
| RsRm                    | -990.00         | 93               | DbDb                    | -95.86          | 90               | DmDs                    | -77.42          | 21               |
| DsRs                    | -990.00         | 44               | RbRm                    | -990.00         | 86               | DbRb                    | -88.37          | 141              |
| RbRm                    | -990.00         | 84               | RsRm                    | -990.00         | 96               | DbDb                    | -95.01          | 116              |
| DsRm                    | -990.00         | 36               | DsDs                    | -990.00         | 17               | DsDs                    | -990.00         | 16               |
| RbDs                    | -990.00         | 40               | RsDs                    | -990.00         | 18               | DbDs                    | -990.00         | 21               |
| RmDs                    | -990.00         | 17               | DsRm                    | -990.00         | 49               | RmRb                    | -990.00         | 53               |
| DsDs                    | -990.00         | 22               | RbDs                    | -990.00         | 38               | RsRb                    | -990.00         | 86               |
| RsDs                    | -990.00         | 17               | DmRm                    | -990.00         | 15               | RsDs                    | -990.00         | 31               |
| DsRb                    | -990.00         | 72               | RmDs                    | -990.00         | 16               | RmDs                    | -990.00         | 27               |
| RsRb                    | -990.00         | 53               | RmRb                    | -990.00         | 47               | RbRs                    | -990.00         | 85               |
| RmRb                    | -990.00         | 44               | RbRs                    | -990.00         | 51               | DmRm                    | -990.00         | 15               |
| DmDs                    | -990.00         | 21               | DbDs                    | -990.00         | 19               | DbRs                    | -990.00         | 15               |
| DmRs                    | -990.00         | 9                | DmRs                    | -990.00         | 3                | RmDb                    | -990.00         | 16               |
| RbRs                    | -990.00         | 54               | DmDs                    | -990.00         | 21               | DsRb                    | -990.00         | 48               |
| RsDb                    | -990.00         | 43               | RmRs                    | -990.00         | 20               | DmRs                    | -990.00         | 2                |
| RmRs                    | -990.00         | 30               | DsRs                    | -990.00         | 14               | DsRs                    | -990.00         | 2                |
| DbDs                    | -990.00         | 22               | RsDb                    | -990.00         | 45               | RbRm                    | -990.00         | 106              |
| DbRs                    | -990.00         | 20               | DbRs                    | -990.00         | 21               | RsDb                    | -990.00         | 38               |
| RmDb                    | -990.00         | 17               | RmDb                    | -990.00         | 18               | RmRs                    | -990.00         | 17               |

| Contribution patch n.31 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.32 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.33 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 101              | RsRb                    | -21.57          | 107              | RbDb                    | -15.87          | 86               |
| RsDm                    | 28.95           | 32               | DsRb                    | -26.53          | 71               | RsRb                    | -20.28          | 92               |
| DsDm                    | -10.10          | 30               | RsDb                    | -27.34          | 198              | RsDb                    | -23.53          | 40               |
| DsRm                    | -20.56          | 27               | RbRm                    | -28.21          | 123              | DsRb                    | -25.75          | 74               |
| DsDb                    | -31.25          | 91               | DsRm                    | -29.69          | 43               | DsDb                    | -26.81          | 56               |
| RbDs                    | -32.35          | 55               | RbDs                    | -32.23          | 38               | RsDm                    | -31.37          | 29               |
| RbDb                    | -34.57          | 96               | RbDb                    | -36.00          | 81               | RbRm                    | -35.06          | 82               |
| RbDm                    | -34.88          | 40               | RbRs                    | -37.05          | 88               | RbRs                    | -37.18          | 94               |
| DsRb                    | -48.70          | 83               | DsDm                    | -38.74          | 26               | RbDs                    | -37.35          | 36               |
| DmRb                    | -58.68          | 83               | DmRb                    | -41.21          | 63               | DsDm                    | -39.06          | 24               |
| DmDm                    | -65.44          | 29               | RsDm                    | -41.31          | 28               | DsDs                    | -48.15          | 22               |
| RmDm                    | -66.34          | 45               | DsDb                    | -43.24          | 96               | DsRs                    | -49.30          | 23               |
| DsDs                    | -67.50          | 19               | RbDm                    | -43.57          | 41               | DmRb                    | -57.90          | 58               |
| DmDb                    | -68.16          | 56               | DsDs                    | -48.05          | 20               | RmDb                    | -60.54          | 25               |
| DbDm                    | -74.98          | 32               | RmDb                    | -54.69          | 20               | DbRb                    | -64.20          | 42               |
| DmDs                    | -81.58          | 22               | DmDb                    | -56.83          | 59               | RbDm                    | -64.26          | 37               |
| DbRb                    | -990.00         | 106              | DbRb                    | -63.87          | 35               | DmDb                    | -65.76          | 66               |
| RsRb                    | -990.00         | 105              | RmDm                    | -67.92          | 91               | DbDm                    | -66.16          | 28               |
| RbRs                    | -990.00         | 88               | DmDm                    | -70.01          | 33               | DbDb                    | -67.30          | 109              |
| RsDs                    | -990.00         | 40               | DbDb                    | -70.99          | 135              | RmDm                    | -69.58          | 94               |
| RmDs                    | -990.00         | 31               | DbDm                    | -81.28          | 32               | DmRs                    | -72.50          | 15               |
| DmRm                    | -990.00         | 15               | DmRm                    | -82.98          | 22               | DmDm                    | -75.06          | 29               |
| DbRm                    | -990.00         | 15               | DmDs                    | -95.02          | 22               | DbRm                    | -76.08          | 20               |
| RbRm                    | -990.00         | 117              | RmRb                    | -990.00         | 81               | DmDs                    | -79.22          | 21               |
| DbDs                    | -990.00         | 19               | RmDs                    | -990.00         | 21               | DmRm                    | -84.34          | 30               |
| DbRs                    | -990.00         | 16               | RsDs                    | -990.00         | 50               | RsDs                    | -990.00         | 30               |
| DmRs                    | -990.00         | 7                | DbRm                    | -990.00         | 15               | DsRm                    | -990.00         | 20               |
| DbDb                    | -990.00         | 160              | DbDs                    | -990.00         | 17               | RmDs                    | -990.00         | 17               |
| RmDb                    | -990.00         | 17               | DsRs                    | -990.00         | 21               | RmRs                    | -990.00         | 70               |
| RmRs                    | -990.00         | 30               | RmRs                    | -990.00         | 49               | DbRs                    | -990.00         | 14               |
| DsRs                    | -990.00         | 27               | DmRs                    | -990.00         | 11               | RsRm                    | -990.00         | 57               |
| RmRb                    | -990.00         | 74               | RsRm                    | -990.00         | 92               | RmRb                    | -990.00         | 72               |
| RsDb                    | -990.00         | 80               | DbRs                    | -990.00         | 13               | DbDs                    | -990.00         | 20               |

| Contribution patch n.34 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDb                    | -20.25          | 34               |
| RsRb                    | -21.53          | 72               |
| DsDb                    | -26.81          | 55               |
| RsDm                    | -28.36          | 27               |
| RbDb                    | -31.56          | 68               |
| DsRb                    | -33.55          | 110              |
| DsDm                    | -34.32          | 26               |
| RbDs                    | -43.96          | 41               |
| DsRs                    | -48.32          | 26               |
| DbDb                    | -51.96          | 76               |
| DbDm                    | -57.19          | 33               |
| DbRb                    | -65.93          | 68               |
| RmDm                    | -69.04          | 54               |
| RbDm                    | -71.94          | 38               |
| DmDm                    | -74.53          | 26               |
| DmRb                    | -74.53          | 93               |
| DmDb                    | -76.03          | 62               |
| DsDs                    | -76.28          | 22               |
| DbRm                    | -79.59          | 26               |
| DmDs                    | -140.95         | 21               |
| RsRm                    | -990.00         | 21               |
| RsDs                    | -990.00         | 17               |
| RmDs                    | -990.00         | 16               |
| DsRm                    | -990.00         | 5                |
| DmRm                    | -990.00         | 7                |
| DbRs                    | -990.00         | 29               |
| RmDb                    | -990.00         | 22               |
| DmRs                    | -990.00         | 23               |
| DbDs                    | -990.00         | 19               |
| RbRs                    | -990.00         | 129              |
| RbRm                    | -990.00         | 53               |
| RmRb                    | -990.00         | 71               |
| RmRs                    | -990.00         | 87               |

| Contribution patch n.35 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| DsDb                    | -42.38          | 51               |
| RsDb                    | -46.26          | 43               |
| RsDm                    | -48.48          | 27               |
| RbDb                    | -64.27          | 106              |
| BbDb                    | -67.53          | 59               |
| BbDm                    | -73.94          | 35               |
| RbDm                    | -75.04          | 34               |
| DsDm                    | -75.65          | 26               |
| DmDb                    | -82.43          | 56               |
| RmDm                    | -84.60          | 37               |
| DmDm                    | -86.08          | 30               |
| RsRm                    | -990.00         | 17               |
| DmRm                    | -990.00         | 2                |
| DbRb                    | -990.00         | 55               |
| DsRs                    | -990.00         | 25               |
| RbRm                    | -990.00         | 47               |
| DsDs                    | -990.00         | 23               |
| RsDs                    | -990.00         | 20               |
| DsRm                    | -990.00         | 2                |
| DsDs                    | -990.00         | 2                |
| DsRm                    | -990.00         | 41               |
| DbRm                    | -990.00         | 26               |
| RmDs                    | -990.00         | 16               |
| RmRs                    | -990.00         | 24               |
| DsRb                    | -990.00         | 67               |
| RmRb                    | -990.00         | 22               |
| DbDs                    | -990.00         | 27               |
| DmRs                    | -990.00         | 114              |
| DsRb                    | -990.00         | 62               |
| RsRb                    | -990.00         | 145              |
| RbRs                    | -990.00         | 94               |
| RmRs                    | -990.00         | 68               |
| DbRs                    | -990.00         | 38               |
| RmDb                    | -990.00         | 17               |

| Contribution patch n.36 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDb                    | -38.10          | 41               |
| RsDm                    | -48.03          | 28               |
| DsDb                    | -52.76          | 38               |
| RbDb                    | -58.65          | 87               |
| BbDb                    | -74.25          | 69               |
| RbDm                    | -77.48          | 34               |
| DsDm                    | -78.08          | 26               |
| RmDm                    | -84.59          | 49               |
| DmDb                    | -86.37          | 52               |
| DbDm                    | -88.94          | 26               |
| DmDm                    | -91.76          | 26               |
| RsRm                    | -990.00         | 17               |
| DsRs                    | -990.00         | 25               |
| RbRm                    | -990.00         | 40               |
| DbRb                    | -990.00         | 101              |
| RbDs                    | -990.00         | 44               |
| RsDs                    | -990.00         | 20               |
| DsRm                    | -990.00         | 2                |
| DsDs                    | -990.00         | 23               |
| DsRm                    | -990.00         | 23               |
| DbRm                    | -990.00         | 17               |
| RmDs                    | -990.00         | 93               |
| RmRs                    | -990.00         | 113              |
| DsRb                    | -990.00         | 58               |
| RmRb                    | -990.00         | 44               |
| DbDs                    | -990.00         | 26               |
| DmRs                    | -990.00         | 26               |
| RsRb                    | -990.00         | 53               |
| DmRb                    | -990.00         | 61               |
| DmRm                    | -990.00         | 2                |
| RmDb                    | -990.00         | 20               |
| RbRs                    | -990.00         | 139              |
| DbRs                    | -990.00         | 51               |

| Contribution patch n.37 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -51.18          | 44               |
| RsDb                    | -52.64          | 91               |
| DsDb                    | -63.24          | 72               |
| RbDb                    | -65.80          | 115              |
| RmDb                    | -74.88          | 45               |
| DsDm                    | -74.93          | 37               |
| DmDb                    | -76.66          | 123              |
| RbDm                    | -78.71          | 49               |
| DbDb                    | -84.58          | 90               |
| RmDm                    | -87.04          | 92               |
| DbDm                    | -89.39          | 48               |
| DmDm                    | -89.39          | 26               |
| DmRm                    | -990.00         | 2                |
| DsDs                    | -990.00         | 35               |
| RsRm                    | -990.00         | 34               |
| RbRm                    | -990.00         | 65               |
| DbRb                    | -990.00         | 172              |
| RbDs                    | -990.00         | 59               |
| RsDs                    | -990.00         | 41               |
| RmDs                    | -990.00         | 17               |
| DbRm                    | -990.00         | 27               |
| DsRm                    | -990.00         | 2                |
| DsRs                    | -990.00         | 41               |
| DbDs                    | -990.00         | 50               |
| RmRb                    | -990.00         | 54               |
| DmDs                    | -990.00         | 24               |
| DmRs                    | -990.00         | 25               |
| DsRb                    | -990.00         | 190              |
| RbRs                    | -990.00         | 130              |
| RmRs                    | -990.00         | 161              |
| DmRb                    | -990.00         | 118              |
| DbRs                    | -990.00         | 102              |
| RsRb                    | -990.00         | 54               |

| Contribution patch n.38 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RmDb                    | -48.95          | 78               |
| RsDm                    | -55.65          | 41               |
| RbDb                    | -63.83          | 167              |
| DmDb                    | -69.49          | 112              |
| DsDm                    | -73.08          | 45               |
| RbDm                    | -74.53          | 51               |
| DsDb                    | -74.55          | 106              |
| RmDm                    | -80.42          | 112              |
| DmDm                    | -84.89          | 38               |
| DbDb                    | -89.87          | 90               |
| DbDm                    | -106.51         | 47               |
| RsRm                    | -990.00         | 26               |
| DmRm                    | -990.00         | 4                |
| DbRb                    | -990.00         | 115              |
| DsRs                    | -990.00         | 44               |
| RbRm                    | -990.00         | 58               |
| DsDs                    | -990.00         | 34               |
| RmDs                    | -990.00         | 32               |
| RbDs                    | -990.00         | 59               |
| DbRm                    | -990.00         | 61               |
| RsDs                    | -990.00         | 33               |
| DsRm                    | -990.00         | 6                |
| DsRb                    | -990.00         | 246              |
| RmRb                    | -990.00         | 91               |
| DbDs                    | -990.00         | 65               |
| DmDs                    | -990.00         | 31               |
| DmRs                    | -990.00         | 42               |
| RsRb                    | -990.00         | 88               |
| RsDb                    | -990.00         | 65               |
| RmRs                    | -990.00         | 161              |
| DmRb                    | -990.00         | 112              |
| DbRs                    | -990.00         | 64               |
| RbRs                    | -990.00         | 174              |

| Contribution patch n.39 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -52.66          | 50               |
| RbDb                    | -56.02          | 123              |
| RsDb                    | -57.98          | 53               |
| RmDb                    | -65.94          | 65               |
| DsDb                    | -66.68          | 97               |
| DsDm                    | -67.63          | 33               |
| DmDb                    | -69.49          | 77               |
| RbDm                    | -74.10          | 65               |
| RmDm                    | -79.13          | 68               |
| DmDm                    | -83.05          | 46               |
| DmRm                    | -85.82          | 77               |
| DbDb                    | -85.94          | 89               |
| DbDm                    | -107.66         | 45               |
| RsRm                    | -990.00         | 66               |
| DsRm                    | -990.00         | 19               |
| RbRm                    | -990.00         | 67               |
| DbRb                    | -990.00         | 85               |
| DsDs                    | -990.00         | 25               |
| RbDs                    | -990.00         | 61               |
| RmDs                    | -990.00         | 23               |
| DbRm                    | -990.00         | 47               |
| RsDs                    | -990.00         | 22               |
| DsRs                    | -990.00         | 29               |
| DbDs                    | -990.00         | 45               |
| RmRb                    | -990.00         | 104              |
| DsRb                    | -990.00         | 141              |
| DmRs                    | -990.00         | 27               |
| DmDs                    | -990.00         | 41               |
| RbRs                    | -990.00         | 107              |
| RmRs                    | -990.00         | 113              |
| DmRb                    | -990.00         | 138              |
| DbRs                    | -990.00         | 29               |
| RsRb                    | -990.00         | 100              |

| Contribution patch n.40 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RbDs                    | -47.90          | 70               |
| RsDm                    | -50.06          | 43               |
| RbDb                    | -53.64          | 121              |
| RsDb                    | -57.98          | 45               |
| DsDm                    | -63.02          | 36               |
| DmRb                    | -63.19          | 160              |
| DsDb                    | -66.68          | 83               |
| RbDm                    | -67.54          | 72               |
| DmDb                    | -68.87          | 159              |
| RmDb                    | -69.13          | 47               |
| DbRm                    | -69.85          | 98               |
| DbRb                    | -75.24          | 136              |
| RmDm                    | -76.98          | 71               |
| DbDb                    | -80.16          | 108              |
| DmRm                    | -80.56          | 63               |
| DmDm                    | -81.66          | 45               |
| DbDm                    | -86.87          | 51               |
| DsDs                    | -990.00         | 36               |
| RsRm                    | -990.00         | 149              |
| RsRb                    | -990.00         | 105              |
| RbRs                    | -990.00         | 107              |
| RsDs                    | -990.00         | 28               |
| RmDs                    | -990.00         | 21               |
| DsRm                    | -990.00         | 48               |
| RmRb                    | -990.00         | 83               |
| DbRs                    | -990.00         | 24               |
| DmDs                    | -990.00         | 27               |
| DsRb                    | -990.00         | 81               |
| DmRs                    | -990.00         | 15               |
| DsRs                    | -990.00         | 54               |
| RbRm                    | -990.00         | 136              |
| DbDs                    | -990.00         | 31               |
| RmRs                    | -990.00         | 68               |

| Contribution patch n.41 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsRb                    | -30.62          | 125              |
| DsRb                    | -34.15          | 106              |
| RbDs                    | -39.20          | 57               |
| RbDb                    | -42.71          | 84               |
| RsDm                    | -43.44          | 42               |
| DbRm                    | -53.06          | 60               |
| RbDm                    | -53.66          | 66               |
| DsDm                    | -55.93          | 24               |
| DsDb                    | -58.24          | 65               |
| DmRb                    | -59.84          | 72               |
| DbDm                    | -61.14          | 40               |
| RmDm                    | -71.44          | 68               |
| DsDs                    | -74.17          | 23               |
| DbRb                    | -75.75          | 168              |
| DmDm                    | -76.63          | 31               |
| DbDb                    | -77.65          | 104              |
| DmRm                    | -79.99          | 27               |
| DmDb                    | -80.13          | 128              |
| RsRm                    | -990.00         | 144              |
| DsRm                    | -990.00         | 76               |
| RmDs                    | -990.00         | 35               |
| RbRs                    | -990.00         | 62               |
| RsDs                    | -990.00         | 35               |
| RbRm                    | -990.00         | 162              |
| DbDs                    | -990.00         | 21               |
| DbRs                    | -990.00         | 21               |
| DmRs                    | -990.00         | 9                |
| DmDs                    | -990.00         | 21               |
| RmDb                    | -990.00         | 17               |
| RmRs                    | -990.00         | 51               |
| DsRs                    | -990.00         | 83               |
| RmRb                    | -990.00         | 57               |
| RsDb                    | -990.00         | 39               |

| Contribution patch n.42 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 154              |
| RsDm                    | 28.95           | 31               |
| DsDm                    | -10.10          | 48               |
| DsRm                    | -21.51          | 43               |
| RbDb                    | -32.50          | 116              |
| RbDs                    | -33.27          | 56               |
| RbDm                    | -36.88          | 45               |
| DsDb                    | -47.05          | 70               |
| DbRm                    | -53.06          | 36               |
| DbDm                    | -61.14          | 45               |
| DsRb                    | -63.63          | 116              |
| DmRb                    | -64.65          | 124              |
| DmDb                    | -67.80          | 124              |
| RmDm                    | -68.14          | 137              |
| DmDm                    | -72.52          | 37               |
| DsDs                    | -76.44          | 22               |
| DmDs                    | -77.84          | 34               |
| DbDb                    | -105.92         | 205              |
| RsRb                    | -990.00         | 154              |
| DbDs                    | -990.00         | 24               |
| RmRb                    | -990.00         | 89               |
| DmRm                    | -990.00         | 27               |
| RsDs                    | -990.00         | 37               |
| RbRs                    | -990.00         | 108              |
| RmDs                    | -990.00         | 36               |
| RmDb                    | -990.00         | 26               |
| RsDb                    | -990.00         | 59               |
| DmRs                    | -990.00         | 4                |
| DbRs                    | -990.00         | 21               |
| RbRm                    | -990.00         | 172              |
| DbRb                    | -990.00         | 240              |
| RmRs                    | -990.00         | 29               |
| DsRs                    | -990.00         | 13               |

| Contribution patch n.43 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.44 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.45 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 102              | RbRm                    | -28.84          | 99               | RbDb                    | -36.45          | 55               |
| RsDm                    | 28.95           | 33               | DsRb                    | -36.69          | 80               | DsRb                    | -38.57          | 66               |
| DsDm                    | -10.10          | 30               | RsDm                    | -40.38          | 28               | DmDb                    | -49.20          | 61               |
| DsRm                    | -10.31          | 32               | RbDb                    | -47.24          | 80               | RsDm                    | -50.37          | 41               |
| RbRm                    | -28.06          | 126              | DsDm                    | -53.55          | 26               | RsDb                    | -56.44          | 28               |
| RbDm                    | -29.21          | 38               | RsDb                    | -56.37          | 39               | DmRb                    | -63.06          | 81               |
| RbDb                    | -32.08          | 89               | DmRb                    | -57.53          | 66               | DsDb                    | -64.14          | 67               |
| DsDb                    | -43.43          | 71               | RbDm                    | -57.77          | 39               | RmDb                    | -64.88          | 23               |
| DsRb                    | -50.26          | 85               | RbDs                    | -57.80          | 38               | DsDm                    | -67.41          | 24               |
| RbDs                    | -50.81          | 49               | DbRb                    | -63.69          | 68               | DbRm                    | -68.13          | 36               |
| DmRb                    | -64.80          | 86               | DsDs                    | -64.25          | 21               | RbDm                    | -68.26          | 53               |
| DmDb                    | -68.05          | 68               | DsDb                    | -64.29          | 39               | DbRb                    | -69.47          | 77               |
| DbDm                    | -68.47          | 28               | DbRm                    | -66.17          | 23               | DbDb                    | -72.90          | 85               |
| DsDs                    | -69.60          | 17               | DmDb                    | -66.58          | 69               | RmDm                    | -75.62          | 40               |
| RmDm                    | -69.77          | 39               | RmDb                    | -67.06          | 17               | DbDm                    | -79.92          | 28               |
| DmDm                    | -72.67          | 28               | RmDm                    | -67.92          | 57               | DmDm                    | -80.75          | 23               |
| DmDs                    | -81.58          | 22               | DbDm                    | -68.47          | 34               | DmRm                    | -92.90          | 42               |
| DbDb                    | -113.03         | 179              | DbDb                    | -71.73          | 111              | DsDs                    | -990.00         | 36               |
| RbRs                    | -990.00         | 71               | DmDm                    | -72.98          | 27               | RsRm                    | -990.00         | 75               |
| RsRb                    | -990.00         | 110              | DmRm                    | -88.09          | 21               | RbRs                    | -990.00         | 81               |
| RmRb                    | -990.00         | 63               | DmDs                    | -139.05         | 21               | RsDs                    | -990.00         | 25               |
| RsDs                    | -990.00         | 25               | RbRs                    | -990.00         | 62               | DsRm                    | -990.00         | 21               |
| RmDs                    | -990.00         | 28               | RsRb                    | -990.00         | 120              | RmDs                    | -990.00         | 16               |
| DmRm                    | -990.00         | 16               | DsRm                    | -990.00         | 48               | RbDs                    | -990.00         | 51               |
| DbRm                    | -990.00         | 15               | RmDs                    | -990.00         | 16               | RsRb                    | -990.00         | 79               |
| DbDs                    | -990.00         | 18               | RsDs                    | -990.00         | 21               | DmDs                    | -990.00         | 21               |
| DmRs                    | -990.00         | 5                | RmRb                    | -990.00         | 64               | DbDs                    | -990.00         | 20               |
| RmDb                    | -990.00         | 17               | RmRs                    | -990.00         | 38               | DmRs                    | -990.00         | 12               |
| DbRs                    | -990.00         | 17               | DmRs                    | -990.00         | 10               | DbRs                    | -990.00         | 13               |
| RsDb                    | -990.00         | 38               | DbRs                    | -990.00         | 13               | DsRs                    | -990.00         | 24               |
| DbRb                    | -990.00         | 176              | RsRm                    | -990.00         | 98               | RbRm                    | -990.00         | 85               |
| DsRs                    | -990.00         | 32               | DbDs                    | -990.00         | 21               | RmRb                    | -990.00         | 64               |
| RmRs                    | -990.00         | 25               | DsRs                    | -990.00         | 35               | RmRs                    | -990.00         | 56               |

| Contribution patch n.46 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RbDb                    | -50.97          | 90               |
| DbDb                    | -51.96          | 131              |
| RsDb                    | -58.99          | 54               |
| RsDm                    | -62.82          | 40               |
| DsDb                    | -65.97          | 74               |
| RmDb                    | -66.14          | 42               |
| DmDb                    | -71.88          | 120              |
| RbDm                    | -79.17          | 52               |
| DmDm                    | -81.98          | 31               |
| DbDm                    | -82.49          | 53               |
| DbRm                    | -82.69          | 45               |
| RmDm                    | -85.68          | 64               |
| DsDm                    | -103.61         | 46               |
| RbRs                    | -990.00         | 140              |
| DsDs                    | -990.00         | 34               |
| RsRm                    | -990.00         | 53               |
| RbRm                    | -990.00         | 74               |
| DbRb                    | -990.00         | 85               |
| RsDs                    | -990.00         | 26               |
| DsRm                    | -990.00         | 15               |
| RbDs                    | -990.00         | 61               |
| DmRm                    | -990.00         | 44               |
| RmDs                    | -990.00         | 26               |
| DbDs                    | -990.00         | 34               |
| DbRs                    | -990.00         | 41               |
| DmDs                    | -990.00         | 31               |
| DsRb                    | -990.00         | 164              |
| DmRs                    | -990.00         | 26               |
| RmRs                    | -990.00         | 111              |
| DsRs                    | -990.00         | 43               |
| RsRb                    | -990.00         | 81               |
| RmRb                    | -990.00         | 109              |
| DmRb                    | -990.00         | 108              |

| Contribution patch n.47 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| DsDb                    | -42.38          | 90               |
| RsDb                    | -46.26          | 44               |
| RbDb                    | -53.05          | 150              |
| RsDm                    | -54.25          | 37               |
| DbDb                    | -67.53          | 91               |
| RbDm                    | -78.58          | 51               |
| DsDm                    | -83.13          | 36               |
| DmDb                    | -83.48          | 103              |
| RmDm                    | -86.73          | 60               |
| DmDm                    | -88.67          | 36               |
| DbDm                    | -92.38          | 40               |
| RsRm                    | -990.00         | 27               |
| DmRm                    | -990.00         | 3                |
| DbRb                    | -990.00         | 97               |
| DsRs                    | -990.00         | 40               |
| RbRm                    | -990.00         | 62               |
| DsDs                    | -990.00         | 35               |
| RbDs                    | -990.00         | 60               |
| RsDs                    | -990.00         | 31               |
| RmDs                    | -990.00         | 26               |
| DsRm                    | -990.00         | 3                |
| DbRm                    | -990.00         | 52               |
| DbDs                    | -990.00         | 42               |
| RmRb                    | -990.00         | 86               |
| DsRb                    | -990.00         | 257              |
| DmRs                    | -990.00         | 39               |
| DmDs                    | -990.00         | 37               |
| RsRb                    | -990.00         | 79               |
| RbRs                    | -990.00         | 188              |
| RmRs                    | -990.00         | 132              |
| DmRb                    | -990.00         | 82               |
| DbRs                    | -990.00         | 42               |
| RmDb                    | -990.00         | 45               |

| Contribution patch n.48 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDb                    | -35.94          | 96               |
| RsDm                    | -49.81          | 39               |
| DsDb                    | -52.76          | 71               |
| RbDb                    | -55.69          | 91               |
| DbDb                    | -72.29          | 71               |
| DsDm                    | -78.82          | 31               |
| RbDm                    | -81.41          | 54               |
| DmDb                    | -82.77          | 98               |
| RmDm                    | -85.97          | 51               |
| DbDm                    | -91.31          | 35               |
| DmDm                    | -93.16          | 39               |
| RsRm                    | -990.00         | 27               |
| DmRm                    | -990.00         | 3                |
| DbRb                    | -990.00         | 179              |
| DsRs                    | -990.00         | 40               |
| RbRm                    | -990.00         | 55               |
| DsDs                    | -990.00         | 34               |
| RbDs                    | -990.00         | 66               |
| RsDs                    | -990.00         | 27               |
| RmDs                    | -990.00         | 24               |
| DsRm                    | -990.00         | 3                |
| DbRm                    | -990.00         | 34               |
| DbDs                    | -990.00         | 64               |
| RmRb                    | -990.00         | 75               |
| DsRb                    | -990.00         | 111              |
| DmRs                    | -990.00         | 37               |
| DmDs                    | -990.00         | 37               |
| RsRb                    | -990.00         | 83               |
| RbRs                    | -990.00         | 197              |
| RmRs                    | -990.00         | 147              |
| DmRb                    | -990.00         | 91               |
| DbRs                    | -990.00         | 55               |
| RmDb                    | -990.00         | 28               |

| Contribution patch n.49 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.50 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.51 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsDb                    | -33.94          | 56               | RsDb                    | -33.50          | 46               | RsDb                    | -33.50          | 37               |
| RsDm                    | -51.18          | 32               | RsDm                    | -51.14          | 44               | DsRb                    | -43.69          | 167              |
| DsDb                    | -54.38          | 54               | RbDb                    | -53.39          | 145              | DsDb                    | -44.80          | 87               |
| RbDb                    | -57.06          | 209              | DsDb                    | -53.61          | 93               | RbDs                    | -53.41          | 57               |
| DsDm                    | -72.57          | 48               | DsDm                    | -67.39          | 32               | RbDb                    | -54.26          | 108              |
| DbDb                    | -75.79          | 97               | RbDm                    | -70.85          | 50               | DbRb                    | -58.06          | 84               |
| RbDm                    | -77.19          | 33               | DbDb                    | -74.12          | 83               | DbDb                    | -59.29          | 115              |
| RmDm                    | -87.04          | 62               | RmDm                    | -77.21          | 99               | RmDb                    | -64.01          | 35               |
| DmDb                    | -87.67          | 71               | DmDm                    | -77.90          | 41               | DbDm                    | -66.32          | 43               |
| DbDm                    | -87.88          | 43               | DmDb                    | -83.18          | 91               | RbDm                    | -67.86          | 63               |
| DmDm                    | -89.09          | 42               | DbDm                    | -84.56          | 45               | DmDb                    | -71.80          | 114              |
| RsRm                    | -990.00         | 17               | RsRm                    | -990.00         | 34               | DmRb                    | -73.57          | 144              |
| DsRs                    | -990.00         | 25               | DsRs                    | -990.00         | 45               | RmDm                    | -74.16          | 53               |
| RbRm                    | -990.00         | 39               | RbRm                    | -990.00         | 64               | DmDm                    | -75.12          | 37               |
| DbRb                    | -990.00         | 122              | DbRb                    | -990.00         | 92               | DbRm                    | -77.75          | 44               |
| RbDs                    | -990.00         | 40               | RbDs                    | -990.00         | 55               | DsDm                    | -94.12          | 34               |
| RsDs                    | -990.00         | 25               | RsDs                    | -990.00         | 23               | DsDs                    | -990.00         | 32               |
| DsRm                    | -990.00         | 3                | DsRm                    | -990.00         | 3                | DmRm                    | -990.00         | 107              |
| DsDs                    | -990.00         | 24               | DsDs                    | -990.00         | 35               | RbRs                    | -990.00         | 226              |
| DbRm                    | -990.00         | 35               | DbRm                    | -990.00         | 34               | RsRm                    | -990.00         | 51               |
| RmDs                    | -990.00         | 24               | RmDs                    | -990.00         | 17               | RsDs                    | -990.00         | 28               |
| RmRs                    | -990.00         | 94               | RmRs                    | -990.00         | 141              | RsDm                    | -990.00         | 42               |
| DsRb                    | -990.00         | 289              | DsRb                    | -990.00         | 251              | RmDs                    | -990.00         | 26               |
| RmRb                    | -990.00         | 84               | RmRb                    | -990.00         | 96               | DsRm                    | -990.00         | 15               |
| DbDs                    | -990.00         | 63               | DbDs                    | -990.00         | 41               | DbRs                    | -990.00         | 34               |
| DmDs                    | -990.00         | 34               | DmDs                    | -990.00         | 34               | DbDs                    | -990.00         | 30               |
| DmRs                    | -990.00         | 41               | DmRs                    | -990.00         | 38               | DmRs                    | -990.00         | 32               |
| RsRb                    | -990.00         | 77               | RsRb                    | -990.00         | 89               | DmDs                    | -990.00         | 32               |
| DmRb                    | -990.00         | 65               | DmRb                    | -990.00         | 90               | RmRb                    | -990.00         | 104              |
| DmRm                    | -990.00         | 3                | DmRm                    | -990.00         | 2                | DsRs                    | -990.00         | 37               |
| RmDb                    | -990.00         | 20               | RmDb                    | -990.00         | 27               | RbRm                    | -990.00         | 75               |
| RbRs                    | -990.00         | 218              | RbRs                    | -990.00         | 197              | RsRb                    | -990.00         | 98               |
| DbRs                    | -990.00         | 69               | DbRs                    | -990.00         | 51               | RmRs                    | -990.00         | 119              |

| Contribution patch n.52 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.53 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.54 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| DsRb                    | -19.82          | 77               | DsRb                    | -23.87          | 81               | RsRm                    | 65.27           | 101              |
| RbDs                    | -21.76          | 33               | RbRm                    | -24.26          | 117              | RsDm                    | 28.95           | 32               |
| RbRs                    | -24.81          | 149              | RbDs                    | -29.02          | 38               | DsDm                    | -10.10          | 26               |
| RbDb                    | -27.57          | 72               | RsDb                    | -40.80          | 129              | RbDm                    | -24.38          | 41               |
| RbRm                    | -34.43          | 81               | RsDm                    | -41.22          | 27               | RbRm                    | -25.43          | 111              |
| RsDb                    | -41.55          | 30               | DsDb                    | -41.64          | 76               | DsRm                    | -29.48          | 25               |
| DsDb                    | -44.66          | 43               | RbDb                    | -42.71          | 97               | DsDb                    | -33.54          | 61               |
| RsDm                    | -48.90          | 29               | RbDm                    | -44.16          | 46               | RbDb                    | -34.94          | 89               |
| DsDs                    | -49.80          | 21               | DsRm                    | -44.65          | 50               | RbDs                    | -38.73          | 55               |
| DmRb                    | -56.99          | 71               | DsDm                    | -48.39          | 23               | DsRb                    | -48.99          | 70               |
| DbRb                    | -59.91          | 48               | DmRb                    | -51.01          | 76               | DmRb                    | -59.13          | 76               |
| DsDm                    | -62.08          | 21               | DsDs                    | -51.71          | 17               | RmDm                    | -60.83          | 85               |
| RmDb                    | -62.75          | 35               | DbRb                    | -59.70          | 47               | DmDm                    | -66.16          | 27               |
| RbDm                    | -63.49          | 39               | RmDb                    | -59.95          | 22               | DmDb                    | -68.41          | 61               |
| DmDb                    | -64.22          | 68               | DmDb                    | -60.48          | 65               | DbDm                    | -71.89          | 37               |
| DbDb                    | -65.63          | 94               | RmDm                    | -60.83          | 46               | DsDs                    | -73.77          | 16               |
| RmDm                    | -67.24          | 31               | DbDb                    | -65.44          | 105              | DmDs                    | -81.03          | 23               |
| DbRm                    | -70.00          | 37               | DbRm                    | -68.32          | 16               | DbDb                    | -119.80         | 146              |
| DmDm                    | -75.46          | 35               | DmDm                    | -69.23          | 32               | RbRs                    | -990.00         | 82               |
| DbDm                    | -78.15          | 30               | DmRm                    | -75.93          | 20               | RsRb                    | -990.00         | 102              |
| DmRm                    | -79.49          | 97               | DbDm                    | -76.46          | 36               | RsDs                    | -990.00         | 37               |
| DmDs                    | -140.11         | 29               | DmDs                    | -94.76          | 22               | RmDs                    | -990.00         | 26               |
| RsRb                    | -990.00         | 127              | RbRs                    | -990.00         | 77               | DmRm                    | -990.00         | 15               |
| DsRm                    | -990.00         | 34               | RsRb                    | -990.00         | 116              | DbRm                    | -990.00         | 15               |
| RsDs                    | -990.00         | 19               | RmDs                    | -990.00         | 17               | DbRb                    | -990.00         | 100              |
| RmDs                    | -990.00         | 26               | RsDs                    | -990.00         | 34               | RmDb                    | -990.00         | 17               |
| RmRb                    | -990.00         | 106              | RmRb                    | -990.00         | 76               | DbDs                    | -990.00         | 19               |
| RmRs                    | -990.00         | 60               | RmRs                    | -990.00         | 43               | DmRs                    | -990.00         | 7                |
| DmRs                    | -990.00         | 13               | DmRs                    | -990.00         | 11               | DbRs                    | -990.00         | 13               |
| DbRs                    | -990.00         | 13               | DbRs                    | -990.00         | 13               | DsRs                    | -990.00         | 36               |
| RsRm                    | -990.00         | 72               | RsRm                    | -990.00         | 97               | RmRb                    | -990.00         | 67               |
| DbDs                    | -990.00         | 32               | DbDs                    | -990.00         | 20               | RsDb                    | -990.00         | 63               |
| DsRs                    | -990.00         | 23               | DsRs                    | -990.00         | 24               | RmRs                    | -990.00         | 26               |

| Contribution patch n.55 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.56 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.57 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 102              | RsRb                    | -27.42          | 111              | RsDm                    | -50.95          | 26               |
| RsDm                    | 28.95           | 32               | DsRb                    | -39.63          | 112              | RbDb                    | -64.40          | 82               |
| DsDm                    | -10.10          | 29               | RsDm                    | -43.10          | 27               | DbRm                    | -68.52          | 59               |
| DsRm                    | -11.94          | 35               | RbDb                    | -52.22          | 82               | RbDm                    | -73.30          | 34               |
| RbDb                    | -32.13          | 75               | DbRm                    | -58.37          | 44               | DsDm                    | -75.37          | 24               |
| DsDb                    | -44.94          | 50               | RbDm                    | -62.05          | 36               | DbRb                    | -75.83          | 88               |
| RbDm                    | -48.60          | 42               | DbDm                    | -62.81          | 38               | DsDb                    | -81.00          | 48               |
| DbRm                    | -52.55          | 28               | DsDm                    | -66.08          | 25               | DmRb                    | -84.87          | 81               |
| DbDm                    | -64.25          | 30               | DsDb                    | -66.21          | 45               | DmDm                    | -86.80          | 23               |
| DmRb                    | -64.80          | 85               | DmRb                    | -73.10          | 55               | DmDb                    | -87.37          | 83               |
| DmDb                    | -69.23          | 84               | DmDm                    | -82.70          | 28               | RmDm                    | -88.14          | 33               |
| RmDm                    | -69.77          | 36               | RmDm                    | -83.25          | 36               | DbDm                    | -90.28          | 28               |
| DmDm                    | -76.04          | 26               | DbRb                    | -87.95          | 145              | DmRm                    | -92.94          | 25               |
| DmDs                    | -81.58          | 22               | DmDb                    | -88.14          | 69               | DbDb                    | -95.21          | 89               |
| DbRb                    | -88.19          | 184              | DmRm                    | -92.70          | 16               | RbRs                    | -990.00         | 57               |
| DbDb                    | -94.14          | 174              | DbDb                    | -93.65          | 90               | RbRm                    | -990.00         | 82               |
| DsDs                    | -990.00         | 18               | RsRm                    | -990.00         | 96               | RsRm                    | -990.00         | 88               |
| RsRb                    | -990.00         | 95               | RbRm                    | -990.00         | 88               | RsRb                    | -990.00         | 57               |
| RmRb                    | -990.00         | 55               | DsRm                    | -990.00         | 52               | DsDs                    | -990.00         | 23               |
| RbRs                    | -990.00         | 65               | RsDs                    | -990.00         | 16               | RsDs                    | -990.00         | 18               |
| RsDs                    | -990.00         | 22               | RbDs                    | -990.00         | 39               | DsRm                    | -990.00         | 30               |
| RmDs                    | -990.00         | 28               | RmDs                    | -990.00         | 16               | RmDs                    | -990.00         | 16               |
| DmRm                    | -990.00         | 15               | DsDs                    | -990.00         | 20               | RbDs                    | -990.00         | 43               |
| RbDs                    | -990.00         | 46               | RmRb                    | -990.00         | 50               | DbDs                    | -990.00         | 19               |
| DbRs                    | -990.00         | 18               | DbRs                    | -990.00         | 18               | DbRs                    | -990.00         | 16               |
| RmDb                    | -990.00         | 18               | DbDs                    | -990.00         | 19               | DmDs                    | -990.00         | 22               |
| DsRb                    | -990.00         | 84               | DmRs                    | -990.00         | 7                | DmRs                    | -990.00         | 10               |
| DmRs                    | -990.00         | 2                | DmDs                    | -990.00         | 21               | DsRb                    | -990.00         | 48               |
| DbDs                    | -990.00         | 18               | RmRs                    | -990.00         | 25               | RmRs                    | -990.00         | 38               |
| DsRs                    | -990.00         | 6                | DsRs                    | -990.00         | 48               | DsRs                    | -990.00         | 31               |
| RbRm                    | -990.00         | 114              | RsDb                    | -990.00         | 46               | RsDb                    | -990.00         | 37               |
| RsDb                    | -990.00         | 36               | RmDb                    | -990.00         | 17               | RmDb                    | -990.00         | 17               |
| RmRs                    | -990.00         | 19               | RbRs                    | -990.00         | 51               | RmRb                    | -990.00         | 47               |

| Contribution patch n.58 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.59 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.60 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RbDb                    | -53.05          | 66               | DmDb                    | -43.81          | 59               | RsDm                    | -50.47          | 27               |
| RmDb                    | -66.14          | 21               | RbDb                    | -49.96          | 70               | RsDb                    | -51.79          | 52               |
| DmDb                    | -77.10          | 52               | RsDm                    | -57.27          | 26               | RbDb                    | -55.18          | 78               |
| DsDb                    | -77.56          | 59               | RsDb                    | -66.21          | 37               | DsDb                    | -64.50          | 52               |
| RbDm                    | -80.23          | 32               | RmDb                    | -70.10          | 32               | RbDm                    | -78.00          | 32               |
| DmDm                    | -89.75          | 21               | DsDb                    | -74.04          | 63               | DsDm                    | -81.99          | 25               |
| RmDm                    | -91.87          | 35               | DsDm                    | -74.73          | 23               | DbDb                    | -83.04          | 65               |
| DbDb                    | -96.38          | 63               | RbDm                    | -83.27          | 31               | DmDb                    | -83.56          | 72               |
| DbDm                    | -103.02         | 27               | RmDm                    | -87.62          | 40               | RmDm                    | -86.56          | 48               |
| DsDm                    | -107.42         | 22               | DbDb                    | -88.58          | 79               | DbDm                    | -91.62          | 27               |
| RsRm                    | -990.00         | 53               | DbDm                    | -93.08          | 26               | DmDm                    | -93.31          | 23               |
| DbRm                    | -990.00         | 27               | DmDm                    | -94.71          | 22               | RsRm                    | -990.00         | 17               |
| DbRb                    | -990.00         | 63               | DmRm                    | -990.00         | 6                | DmRm                    | -990.00         | 2                |
| DsRs                    | -990.00         | 23               | DsDs                    | -990.00         | 23               | DbRb                    | -990.00         | 124              |
| RbRm                    | -990.00         | 60               | RbRm                    | -990.00         | 41               | DsRs                    | -990.00         | 24               |
| RsDm                    | -990.00         | 26               | DbRb                    | -990.00         | 102              | RbRm                    | -990.00         | 38               |
| RmDs                    | -990.00         | 17               | RsRm                    | -990.00         | 19               | DsDs                    | -990.00         | 23               |
| DsRm                    | -990.00         | 13               | RbDs                    | -990.00         | 44               | RbDs                    | -990.00         | 43               |
| DsDs                    | -990.00         | 22               | RsDs                    | -990.00         | 18               | RsDs                    | -990.00         | 20               |
| RsDs                    | -990.00         | 17               | RmDs                    | -990.00         | 17               | RmDs                    | -990.00         | 17               |
| RbDs                    | -990.00         | 39               | DbRm                    | -990.00         | 38               | DsRm                    | -990.00         | 2                |
| RmRs                    | -990.00         | 55               | DsRm                    | -990.00         | 3                | DbRm                    | -990.00         | 26               |
| DmRs                    | -990.00         | 13               | DsRs                    | -990.00         | 27               | DbDs                    | -990.00         | 40               |
| RsRb                    | -990.00         | 44               | DbDs                    | -990.00         | 29               | RmRb                    | -990.00         | 50               |
| RmRb                    | -990.00         | 42               | RmRb                    | -990.00         | 44               | DsRb                    | -990.00         | 113              |
| DbDs                    | -990.00         | 20               | DsRb                    | -990.00         | 108              | DmRs                    | -990.00         | 26               |
| DmDs                    | -990.00         | 21               | DmRs                    | -990.00         | 19               | DmDs                    | -990.00         | 26               |
| DsRb                    | -990.00         | 77               | DmDs                    | -990.00         | 21               | RsRb                    | -990.00         | 48               |
| DmRb                    | -990.00         | 93               | RbRs                    | -990.00         | 83               | RbRs                    | -990.00         | 127              |
| RsDb                    | -990.00         | 32               | RmRs                    | -990.00         | 73               | RmRs                    | -990.00         | 89               |
| DmRm                    | -990.00         | 31               | DmRb                    | -990.00         | 65               | DmRb                    | -990.00         | 74               |
| RbRs                    | -990.00         | 63               | DbRs                    | -990.00         | 31               | DbRs                    | -990.00         | 33               |
| DbRs                    | -990.00         | 22               | RsRb                    | -990.00         | 41               | RmDb                    | -990.00         | 34               |

| Contribution patch n.61 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RbDb                    | -45.91          | 95               |
| RsDm                    | -51.16          | 27               |
| RsDb                    | -51.16          | 48               |
| DsDb                    | -63.11          | 40               |
| DsDm                    | -72.08          | 25               |
| RbDm                    | -74.42          | 33               |
| DbDb                    | -84.42          | 55               |
| DbDm                    | -85.69          | 25               |
| RmDm                    | -86.71          | 53               |
| DmDm                    | -88.97          | 28               |
| DmDb                    | -93.01          | 55               |
| RsRm                    | -990.00         | 17               |
| DbRb                    | -990.00         | 115              |
| DsRs                    | -990.00         | 25               |
| RbRm                    | -990.00         | 43               |
| DsDs                    | -990.00         | 24               |
| RsDs                    | -990.00         | 27               |
| DsRm                    | -990.00         | 2                |
| RbDs                    | -990.00         | 38               |
| DbRm                    | -990.00         | 23               |
| RmDs                    | -990.00         | 17               |
| RmRs                    | -990.00         | 97               |
| DbDs                    | -990.00         | 42               |
| RmRb                    | -990.00         | 60               |
| DsRb                    | -990.00         | 124              |
| DmRs                    | -990.00         | 26               |
| DmDs                    | -990.00         | 24               |
| RsRb                    | -990.00         | 55               |
| DmRb                    | -990.00         | 66               |
| DmRm                    | -990.00         | 2                |
| RmDb                    | -990.00         | 19               |
| RbRs                    | -990.00         | 140              |
| DbRs                    | -990.00         | 85               |

| Contribution patch n.62 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDm                    | -46.80          | 26               |
| RsDb                    | -49.01          | 39               |
| RbDb                    | -55.54          | 94               |
| DsDm                    | -62.39          | 25               |
| RbDm                    | -64.30          | 43               |
| DsDb                    | -68.62          | 51               |
| RmDm                    | -73.56          | 85               |
| DbDm                    | -74.32          | 39               |
| DbDb                    | -75.37          | 81               |
| DmDm                    | -78.78          | 33               |
| DmDb                    | -88.82          | 58               |
| RsRm                    | -990.00         | 17               |
| DsRs                    | -990.00         | 24               |
| RbRm                    | -990.00         | 48               |
| DbRb                    | -990.00         | 69               |
| RbDs                    | -990.00         | 38               |
| RsDs                    | -990.00         | 18               |
| DsRm                    | -990.00         | 2                |
| DsDs                    | -990.00         | 19               |
| DbRm                    | -990.00         | 23               |
| RmDs                    | -990.00         | 16               |
| RmRs                    | -990.00         | 94               |
| RmRb                    | -990.00         | 69               |
| DsRb                    | -990.00         | 85               |
| DmRs                    | -990.00         | 26               |
| DbDs                    | -990.00         | 25               |
| DmDs                    | -990.00         | 22               |
| RsRb                    | -990.00         | 64               |
| DmRb                    | -990.00         | 87               |
| DmRm                    | -990.00         | 2                |
| RmDb                    | -990.00         | 18               |
| RbRs                    | -990.00         | 159              |
| DbRs                    | -990.00         | 35               |

| Contribution patch n.63 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RsDb                    | -20.15          | 32               |
| DsRb                    | -20.44          | 83               |
| RsDm                    | -20.91          | 27               |
| RbDb                    | -21.55          | 82               |
| DsDb                    | -28.92          | 59               |
| RbRs                    | -31.72          | 138              |
| DsDm                    | -44.16          | 23               |
| RbDs                    | -52.64          | 38               |
| DsRs                    | -54.84          | 28               |
| RbDm                    | -55.77          | 46               |
| DbDm                    | -57.37          | 38               |
| DbDb                    | -59.22          | 102              |
| DbRb                    | -60.97          | 69               |
| RmDm                    | -64.01          | 56               |
| DmDm                    | -71.54          | 33               |
| DmRb                    | -72.02          | 102              |
| DmRs                    | -73.93          | 22               |
| DmDb                    | -76.01          | 58               |
| DsDs                    | -76.77          | 18               |
| DbRm                    | -77.21          | 20               |
| DmDs                    | -102.71         | 21               |
| DmRm                    | -990.00         | 11               |
| DsRm                    | -990.00         | 4                |
| RsDs                    | -990.00         | 22               |
| RmDs                    | -990.00         | 17               |
| RsRm                    | -990.00         | 20               |
| DbDs                    | -990.00         | 21               |
| RmDb                    | -990.00         | 18               |
| DbRs                    | -990.00         | 29               |
| RmRs                    | -990.00         | 92               |
| RsRb                    | -990.00         | 67               |
| RbRm                    | -990.00         | 54               |
| RmRb                    | -990.00         | 68               |

| Contribution patch n.64 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.65 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.66 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsRb                    | -13.66          | 78               | DmRm                    | -7.38           | 25               | RsRm                    | 65.27           | 109              |
| RbDb                    | -18.09          | 146              | RsRb                    | -20.02          | 97               | RsDm                    | 28.95           | 34               |
| RsDb                    | -21.77          | 65               | RbRm                    | -22.16          | 114              | DsDm                    | -10.10          | 37               |
| DsRb                    | -23.93          | 68               | RsDb                    | -26.93          | 183              | RbRm                    | -20.58          | 127              |
| RsDm                    | -24.03          | 28               | RsDm                    | -28.18          | 27               | RbDm                    | -27.18          | 42               |
| RbRm                    | -26.73          | 88               | RbRs                    | -30.16          | 113              | DsRm                    | -36.89          | 23               |
| DsDb                    | -28.92          | 81               | RbDm                    | -30.20          | 38               | DsDb                    | -37.49          | 64               |
| RbRs                    | -29.29          | 118              | DsRb                    | -31.30          | 57               | RbDb                    | -38.13          | 90               |
| DmDm                    | -37.36          | 36               | DmDm                    | -35.77          | 37               | RbDs                    | -41.11          | 62               |
| RmDm                    | -39.88          | 42               | RmDm                    | -36.53          | 50               | DsRb                    | -47.32          | 62               |
| DmDb                    | -40.57          | 70               | RbDb                    | -38.13          | 164              | RmDm                    | -57.19          | 54               |
| RbDs                    | -43.21          | 40               | DsDb                    | -39.03          | 80               | DmRb                    | -58.71          | 81               |
| RbDm                    | -43.57          | 40               | RbDs                    | -39.03          | 45               | DmDm                    | -59.14          | 25               |
| DsDm                    | -45.81          | 22               | RmDb                    | -39.78          | 26               | DsDs                    | -71.87          | 19               |
| RmDb                    | -50.32          | 22               | DmDb                    | -40.57          | 80               | DbDm                    | -74.40          | 42               |
| DsDs                    | -51.71          | 18               | DmRb                    | -40.84          | 70               | DmDb                    | -79.62          | 54               |
| DmRb                    | -54.39          | 73               | DsRm                    | -42.37          | 27               | DmDs                    | -81.58          | 21               |
| DsRs                    | -54.71          | 25               | DsDm                    | -48.63          | 24               | DbRb                    | -990.00         | 55               |
| DbDm                    | -68.64          | 35               | DsDs                    | -51.46          | 17               | RsRb                    | -990.00         | 97               |
| DmRs                    | -73.06          | 16               | DbDm                    | -79.65          | 35               | RsDs                    | -990.00         | 42               |
| DmRm                    | -76.21          | 63               | DbDb                    | -84.65          | 135              | RmDs                    | -990.00         | 33               |
| DbRm                    | -76.51          | 15               | DmDs                    | -92.39          | 23               | DbRm                    | -990.00         | 15               |
| DbDb                    | -76.59          | 92               | RsRm                    | -990.00         | 92               | RbRs                    | -990.00         | 92               |
| DmDs                    | -78.69          | 22               | RsDs                    | -990.00         | 36               | DmRm                    | -990.00         | 15               |
| RsDs                    | -990.00         | 36               | RmDs                    | -990.00         | 18               | DbDs                    | -990.00         | 24               |
| DsRm                    | -990.00         | 20               | DbRs                    | -990.00         | 13               | DbRs                    | -990.00         | 13               |
| RmDs                    | -990.00         | 17               | RmRb                    | -990.00         | 83               | DmRs                    | -990.00         | 8                |
| DbRs                    | -990.00         | 14               | DmRs                    | -990.00         | 11               | DbDb                    | -990.00         | 133              |
| RmRb                    | -990.00         | 71               | DbDs                    | -990.00         | 19               | RmDb                    | -990.00         | 18               |
| DbDs                    | -990.00         | 20               | DbRm                    | -990.00         | 16               | DsRs                    | -990.00         | 24               |
| RsRm                    | -990.00         | 52               | DbRb                    | -990.00         | 45               | RmRb                    | -990.00         | 75               |
| DbRb                    | -990.00         | 51               | RmRs                    | -990.00         | 52               | RsDb                    | -990.00         | 45               |
| RmRs                    | -990.00         | 75               | DsRs                    | -990.00         | 22               | RmRs                    | -990.00         | 32               |

| Contribution patch n.67 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.68 | Max Power (dBi) | CT (1 cut) (sec) | Contribution patch n.69 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|-------------------------|-----------------|------------------|
| RsRm                    | 65.27           | 102              | RsDm                    | -35.87          | 27               | RsDm                    | -47.25          | 26               |
| RsDm                    | 28.95           | 32               | DsDm                    | -47.33          | 26               | RbDb                    | -57.34          | 88               |
| DsDm                    | -10.10          | 31               | DbRm                    | -52.67          | 52               | DsDb                    | -66.01          | 57               |
| DsRm                    | -14.57          | 37               | DsDb                    | -56.79          | 62               | DsDm                    | -75.22          | 24               |
| DbRm                    | -26.52          | 37               | DbDm                    | -59.24          | 30               | RbDm                    | -76.19          | 31               |
| RbDb                    | -34.48          | 71               | RbDb                    | -61.79          | 71               | DbDm                    | -83.19          | 26               |
| DsDb                    | -37.31          | 46               | RmDm                    | -70.22          | 32               | RmDm                    | -85.19          | 43               |
| RbDm                    | -41.82          | 37               | DmDm                    | -80.45          | 40               | DmDm                    | -91.06          | 23               |
| DbDm                    | -58.86          | 29               | DbRb                    | -85.63          | 30               | DmDb                    | -96.69          | 66               |
| DmRb                    | -64.80          | 77               | DmDb                    | -90.06          | 136              | DbDb                    | -113.69         | 102              |
| RmDm                    | -69.77          | 41               | DbDb                    | -95.55          | 58               | RsRm                    | -990.00         | 94               |
| DmDb                    | -70.30          | 62               | DsRm                    | -100.77         | 98               | DbRb                    | -990.00         | 122              |
| DmDm                    | -76.04          | 26               | RsRm                    | -990.00         | 46               | RmRs                    | -990.00         | 26               |
| DmDs                    | -81.58          | 22               | DsRs                    | -990.00         | 96               | DsRs                    | -990.00         | 19               |
| DbRb                    | -88.50          | 159              | RbRm                    | -990.00         | 3                | RbRm                    | -990.00         | 86               |
| DbDb                    | -92.76          | 154              | RsDs                    | -990.00         | 86               | RbDs                    | -990.00         | 42               |
| DsDs                    | -990.00         | 16               | RmRs                    | -990.00         | 19               | RsDs                    | -990.00         | 20               |
| RsRb                    | -990.00         | 89               | DmRm                    | -990.00         | 19               | DsRm                    | -990.00         | 30               |
| RbRs                    | -990.00         | 77               | RmDs                    | -990.00         | 16               | DsDs                    | -990.00         | 24               |
| RsDs                    | -990.00         | 24               | DsDs                    | -990.00         | 16               | DbRm                    | -990.00         | 29               |
| RmDs                    | -990.00         | 35               | RbDs                    | -990.00         | 19               | RmDs                    | -990.00         | 17               |
| DmRm                    | -990.00         | 20               | RmRs                    | -990.00         | 42               | RmRb                    | -990.00         | 45               |
| RbDs                    | -990.00         | 49               | DsRb                    | -990.00         | 18               | DsRb                    | -990.00         | 133              |
| RbRm                    | -990.00         | 105              | RmRb                    | -990.00         | 107              | RsRb                    | -990.00         | 53               |
| DbDs                    | -990.00         | 20               | DbDs                    | -990.00         | 45               | DbDs                    | -990.00         | 28               |
| DbRs                    | -990.00         | 17               | DmDs                    | -990.00         | 20               | DmDs                    | -990.00         | 22               |
| DmRs                    | -990.00         | 2                | DmRs                    | -990.00         | 22               | DmRs                    | -990.00         | 7                |
| DsRb                    | -990.00         | 50               | RsRb                    | -990.00         | 2                | RmDb                    | -990.00         | 17               |
| RmDb                    | -990.00         | 16               | DmRb                    | -990.00         | 63               | DmRb                    | -990.00         | 81               |
| RmRs                    | -990.00         | 17               | RsDb                    | -990.00         | 54               | RsDb                    | -990.00         | 43               |
| DsRs                    | -990.00         | 2                | RmDb                    | -990.00         | 39               | RbRs                    | -990.00         | 43               |
| RmRb                    | -990.00         | 55               | RbRs                    | -990.00         | 17               | DmRm                    | -990.00         | 50               |
| RsDb                    | -990.00         | 55               | DbRs                    | -990.00         | 53               | DbRs                    | -990.00         | 20               |
|                         |                 |                  |                         |                 | 26               |                         |                 | 25               |

| Contribution patch n.70 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| RbDb                    | -63.72          | 72               |
| DsDb                    | -85.27          | 59               |
| DbDb                    | -95.88          | 68               |
| DmDb                    | -99.20          | 64               |
| DbDm                    | -106.50         | 28               |
| DmDm                    | -116.11         | 22               |
| DmRb                    | -990.00         | 113              |
| DsRs                    | -990.00         | 19               |
| RsDb                    | -990.00         | 46               |
| RmRs                    | -990.00         | 42               |
| RbRm                    | -990.00         | 72               |
| RbDs                    | -990.00         | 42               |
| RsDs                    | -990.00         | 17               |
| RsDm                    | -990.00         | 26               |
| RbDm                    | -990.00         | 30               |
| DbRb                    | -990.00         | 100              |
| RsRm                    | -990.00         | 73               |
| DsDs                    | -990.00         | 23               |
| RmDb                    | -990.00         | 17               |
| RbRs                    | -990.00         | 52               |
| RsRb                    | -990.00         | 45               |
| RmRb                    | -990.00         | 41               |
| DmRm                    | -990.00         | 24               |
| DsRm                    | -990.00         | 16               |
| RmDs                    | -990.00         | 17               |
| DbRm                    | -990.00         | 25               |
| DsDm                    | -990.00         | 23               |
| RmDm                    | -990.00         | 43               |
| DbRs                    | -990.00         | 30               |
| DsRb                    | -990.00         | 173              |
| DbDs                    | -990.00         | 30               |
| DmDs                    | -990.00         | 21               |
| DmRs                    | -990.00         | 11               |

| Contribution patch n.71 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| DmDb                    | -71.16          | 62               |
| RmDb                    | -74.15          | 21               |
| RbDb                    | -80.43          | 64               |
| DsDb                    | -92.05          | 58               |
| DbDb                    | -97.99          | 60               |
| DmRb                    | -990.00         | 112              |
| DsRs                    | -990.00         | 24               |
| RmRs                    | -990.00         | 64               |
| RsDb                    | -990.00         | 46               |
| RbRm                    | -990.00         | 43               |
| RbDs                    | -990.00         | 42               |
| RsDs                    | -990.00         | 17               |
| RsDm                    | -990.00         | 28               |
| RbDm                    | -990.00         | 30               |
| DbRb                    | -990.00         | 79               |
| RsRm                    | -990.00         | 26               |
| DsDs                    | -990.00         | 23               |
| DbRs                    | -990.00         | 26               |
| RbRs                    | -990.00         | 71               |
| RsRb                    | -990.00         | 38               |
| RmRb                    | -990.00         | 38               |
| DmRm                    | -990.00         | 13               |
| DsRm                    | -990.00         | 6                |
| RmDs                    | -990.00         | 17               |
| DbRm                    | -990.00         | 36               |
| DbDs                    | -990.00         | 34               |
| DsDm                    | -990.00         | 23               |
| DbDm                    | -990.00         | 27               |
| RmDm                    | -990.00         | 45               |
| DsRb                    | -990.00         | 194              |
| DmDs                    | -990.00         | 23               |
| DmDm                    | -990.00         | 22               |
| DmRs                    | -990.00         | 18               |

| Contribution patch n.72 | Max Power (dBi) | CT (1 cut) (sec) |
|-------------------------|-----------------|------------------|
| DmDb                    | -44.92          | 60               |
| RsDm                    | -50.91          | 27               |
| RsDb                    | -52.33          | 45               |
| DsDb                    | -64.87          | 53               |
| RbDb                    | -72.17          | 64               |
| RmDb                    | -74.15          | 40               |
| RbDs                    | -77.72          | 34               |
| DsDm                    | -81.99          | 23               |
| DbDb                    | -84.71          | 81               |
| RmDm                    | -86.95          | 48               |
| DmDm                    | -93.31          | 23               |
| DbDm                    | -101.29         | 28               |
| DmRm                    | -990.00         | 2                |
| DsDs                    | -990.00         | 23               |
| RsRm                    | -990.00         | 17               |
| RbRm                    | -990.00         | 38               |
| DbRb                    | -990.00         | 95               |
| RbDs                    | -990.00         | 45               |
| RsDs                    | -990.00         | 22               |
| RmDs                    | -990.00         | 17               |
| DbRm                    | -990.00         | 27               |
| DsRm                    | -990.00         | 2                |
| DsRs                    | -990.00         | 26               |
| DbDs                    | -990.00         | 39               |
| RmRb                    | -990.00         | 47               |
| DmDs                    | -990.00         | 29               |
| DmRs                    | -990.00         | 24               |
| DsRb                    | -990.00         | 160              |
| RbRs                    | -990.00         | 108              |
| RmRs                    | -990.00         | 85               |
| DmRb                    | -990.00         | 103              |
| DbRs                    | -990.00         | 27               |
| RsRb                    | -990.00         | 44               |