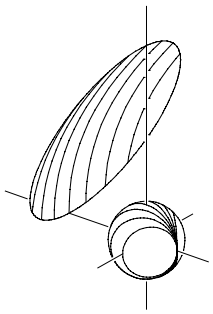

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2000, February 10

Dansk Rumforskningsinstitut
Juliane Maries Vej 30
2100 København Ø

att.: Hans Ulrik Nørgaard-Nielsen

subject: PLANCK project

Dear Hans Ulrik,

New Design Specifications

The new design specifications in Table 5.2.1-1 in the report ”Telescope Design Specification, PT-DS-07024, Draft-01, 07-02-2000” does not change the geometry of the system. The only change is the definition of the feed coordinate system, TFP, which now is in the direction of the bisection of the secondary mirror illumination cone. Due to all horns are defined in the Primary mirror coordinate system, M1, this does not change the system, see Figure 1.

Ka.

Ka is in the report ”Telescope Wave Front Error budget, PL A TN 028, Issue 02, 21/12/99” described as an ”average apodization coefficient”. By this means obviously that the mirror illumination function is used as a weight in the calculation of *Ka.* Normally we calculate the constant, *K*, as the relation between the WFE, δ, and the surface error, ε, in the centre of the mirror illumination and without any weight function:

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$\delta = 2K\varepsilon$.

K is then for

Primary mirror: $K = 0.84$

Secondary mirror: $K = 0.95$

Notice that in these calculations the surface error, ε, is measured in the direction of the surface normal.

Weight functions

The illumination functions in the symmetry plane at 217 GHz are shown in Figure 2 and Figure 3 for both the secondary and primary mirrors, respectively. For the secondary mirror the abscissa is along the mirror rim plane, x_{sk} in Figure 1, and for the primary mirror it is in the z_{M1} direction.

Foci points for primary and secondary mirror

The foci points for the 2 mirrors are shown in Figure 4 and Figure 5.

Aperture dimension for secondary mirror

The aperture dimensions given in Table 5.2.1-1 is defined in the new coordinate system of the secondary mirror M2 in the new Figure 4.3-3. The dimensions are shown in Figure 6. Figure 7 shows the size of the secondary mirror in the rim plane.

With regards

Per Nielsen

Enclosures:

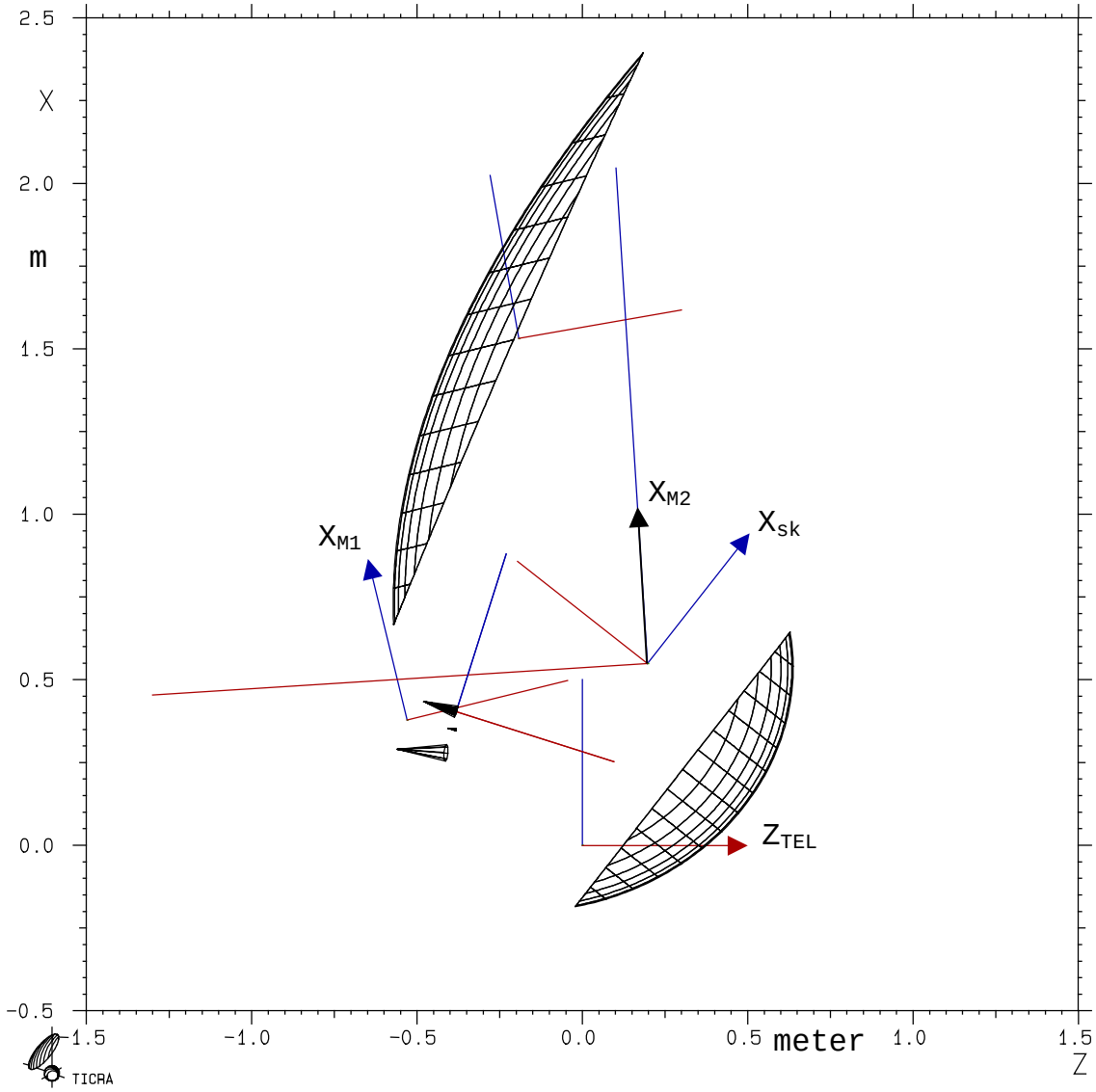

Figure 1 Telescope system.

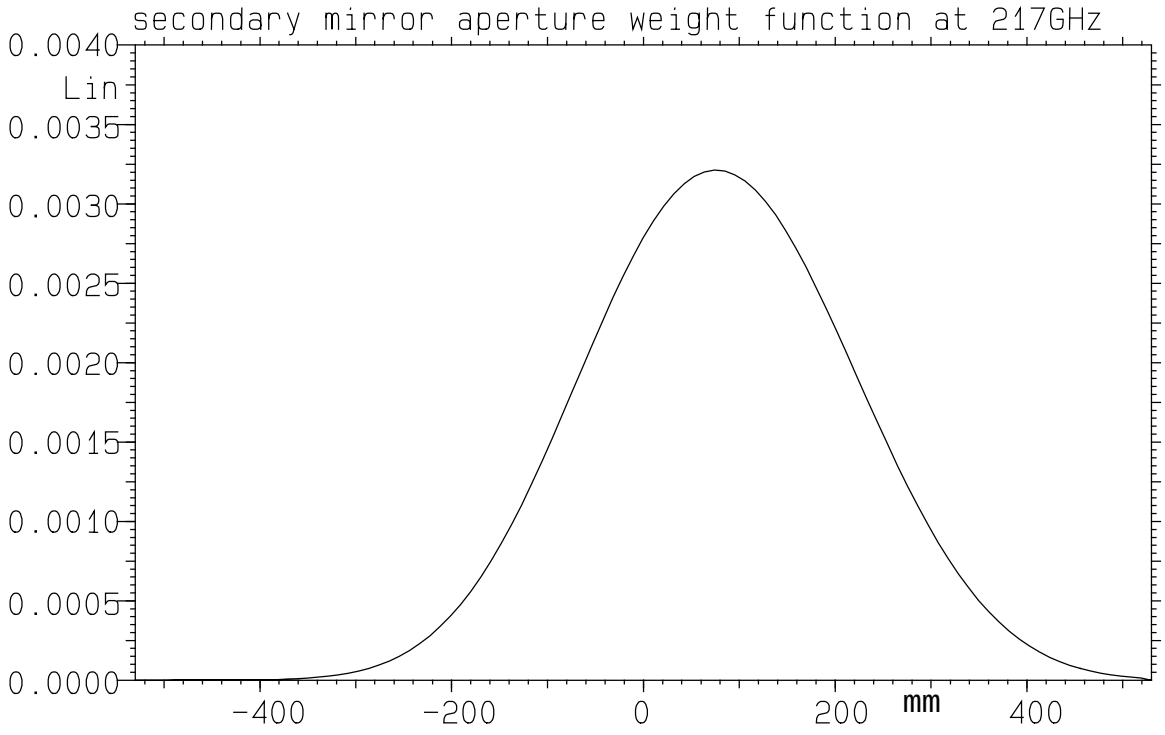

Figure 2 Illumination function of secondary mirror at 217 GHz

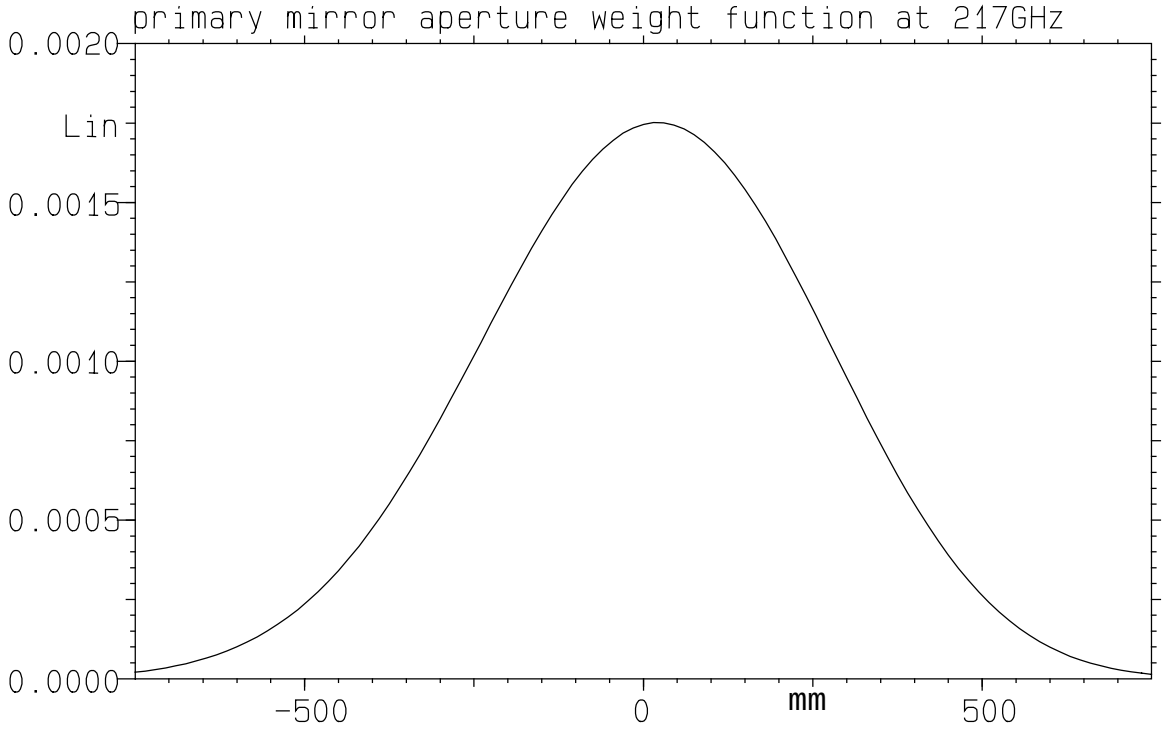

Figure 3 Illumination function of primary mirror at 217 GHz

Figure 4 Primary mirror foci points

Foci distance: 20564.58 mm

Vertex distance: 22054.94 mm

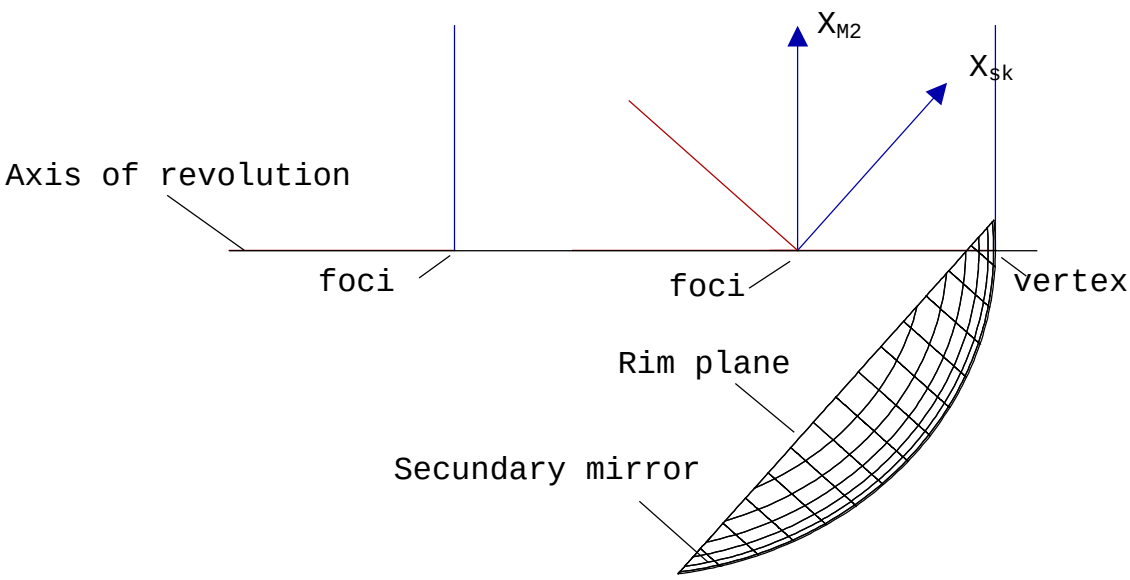

Figure 5 Secondary mirror foci points

foci distance : 761.9193 mm

vertex distance : 1641.58 mm

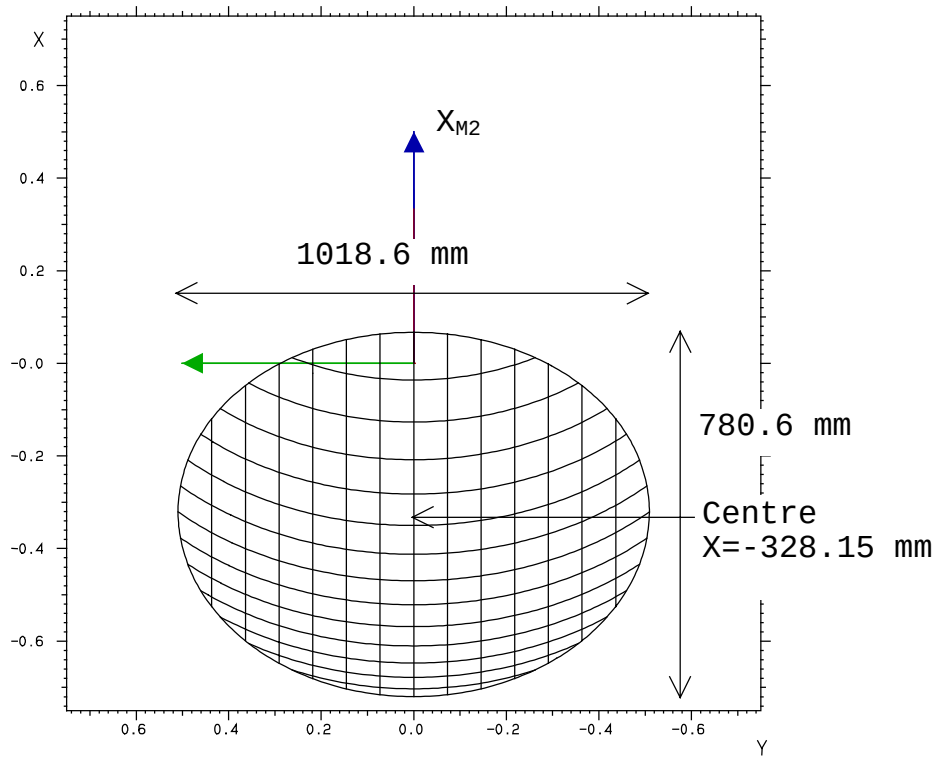

Figure 6 Secondary mirror aperture in direction of axis of revolution

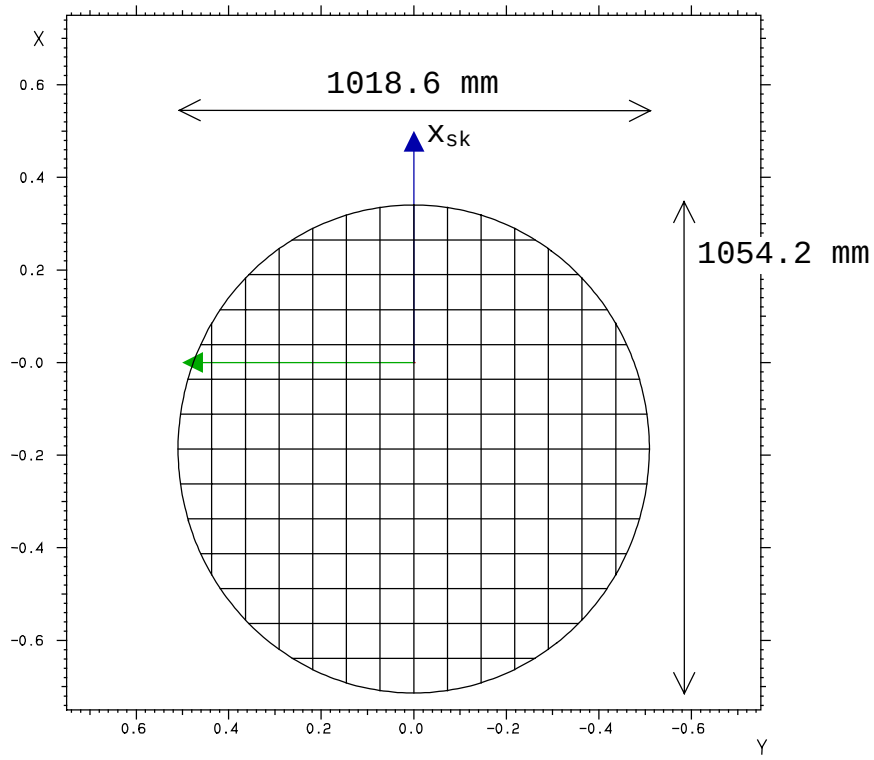

Figure 7 Secondary mirror aperture in rim plane