TMP mirror definitions

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1 Mirror Sag

Mirror Sag is implemented in Zemax as extended polynomials (from a flat surface) of 14 or 20 terms. From these 20 terms most of them are zero. The sag of the mirror is defined following

$$z(x,y) = \sum_{i=0}^{5}\sum_{j=0}^{5} p_{i,j}\left(\frac{x}{R_{max}}\right)^i\left(\frac{y}{R_{max}}\right)^j \text{[mm]}. \tag{1}$$

Here the sum covers 36 elements which define a general order 5 polynomial. This polynomial expansion can be evaluated using the terms shown in tables 1, 2 and 3. The term R_{max} is a normalization length-scale which equals 2500mm.

	j=0	j=1	j=2	j=3	j=4	j=5
i=0	0.000000	0.000000	-98.825141	3.933724	-0.090729	0.0
i=1	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
i=2	-133.127656	5.928934	0.141501	0.000000	0.000000	0.0
i=3	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
i=4	0.298935	0.000000	0.000000	0.000000	0.000000	0.0
i=5	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

Table 1: Primary mirror definition according to 1. Mirror rim has a semi-width of 2520mm in the x direction and 2850mm in the y direction with a decenter of 65mm in the y direction.

	j=0	j=1	j=2	j=3	j=4	j=5
i=0	0.000000	0.000000	-142.89385	16.542098	-1.748626	0.0
i=1	0.000000	0.000000	0.00000	0.000000	0.000000	0.0
i=2	-302.813618	45.268179	-0.90499	0.000000	0.000000	0.0
i=3	0.000000	0.000000	0.00000	0.000000	0.000000	0.0
i=4	8.222494	0.000000	0.00000	0.000000	0.000000	0.0
i=5	0.000000	0.000000	0.00000	0.000000	0.000000	0.0

Table 2: Secondary mirror definition according to 1. Mirror rim has a semi-width of 1780mm in the x direction and 2430mm in the y direction with a decenter of 150mm in the y direction.

	j=0	j=1	j=2	j=3	j=4	j=5
i=0	0.000000	0.000000	-231.128486	12.146513	-2.839845	0.112007
i=1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
i=2	-271.041611	20.701028	-4.823984	0.402409	0.000000	0.000000
i=3	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
i=4	-0.195065	0.179484	0.000000	0.000000	0.000000	0.000000
i=5	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table 3: Tertiary mirror definition according to 1. Mirror rim has a semi-width of 2690 mm in the x direction and 2780 mm in the y direction with a decenter of 110 mm in the y direction.

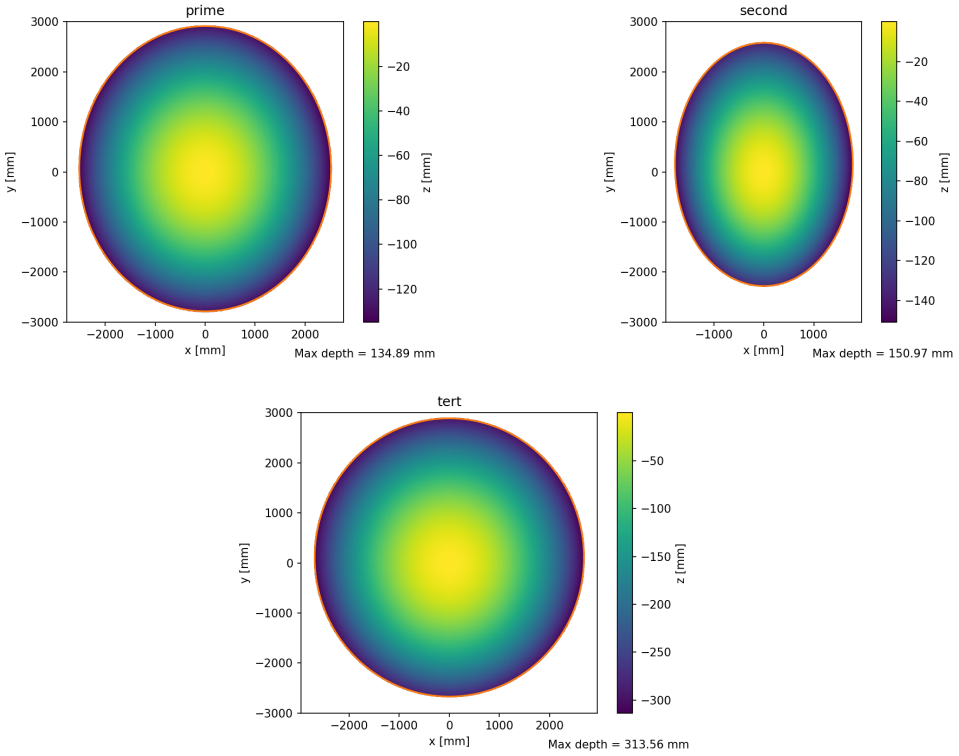

Figure 1: Mirror sag defined with matrix elements accodring to tables 1-3.

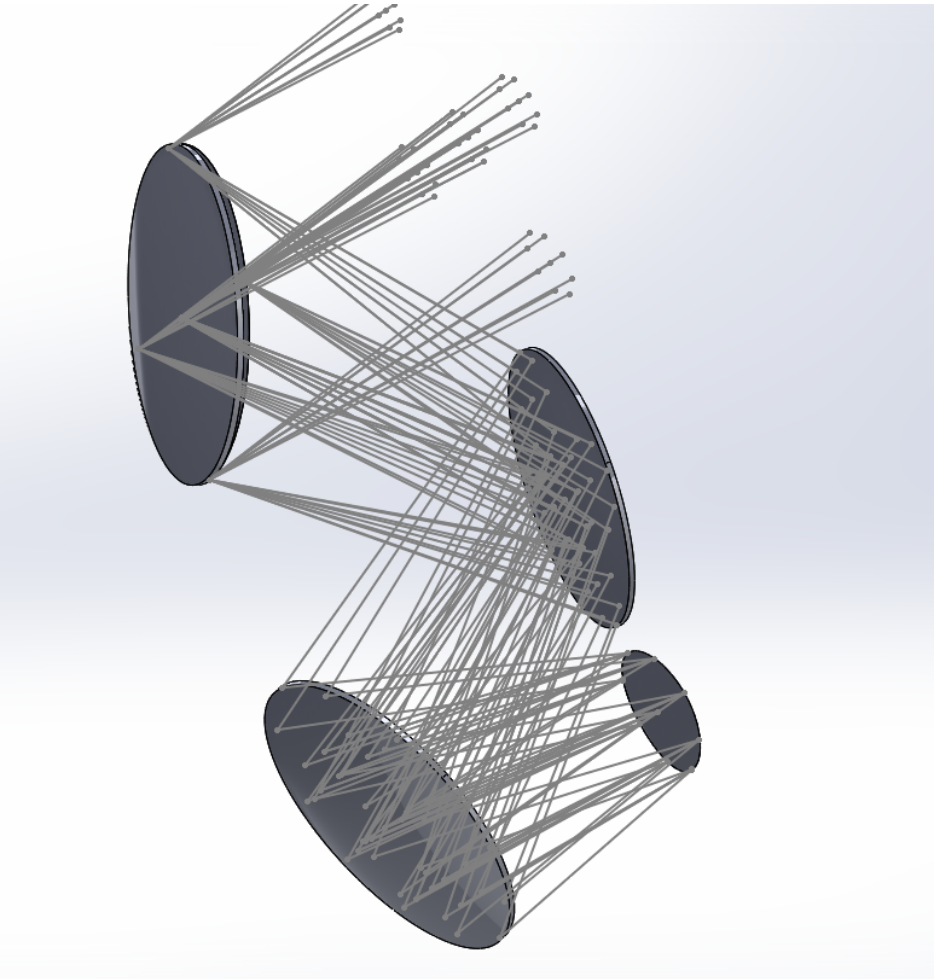

Figure 2: TMP ray trace