TMP Var 8A mirror definitions

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1 Mirror Sag

Mirror Sag is implemented in Zemax as extended polynomials (from a flat surface) of XX or XX terms. From these XX 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 XX elements which define a general order X 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 mm.

	j=0	j=1	j=2	j=3	j=4	j=5
i=0	0.000000	-4.805417	-114.281586	3.971894	-0.096818	0.0
i=1	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
i=2	-138.667041	5.410397	0.118027	0.000000	0.000000	0.0
i=3	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
i=4	0.251763	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 XXmm in the x direction and XXmm in the y direction.

	j=0	j=1	j=2	j=3	j=4	j=5
i=0	0.000000	-16.745827	-221.025344	23.523376	-3.081522	0.0
i=1	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
i=2	-388.257509	56.321201	-0.873452	0.000000	0.000000	0.0
i=3	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
i=4	12.245981	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 2: Secondary mirror definition according to 1. Mirror rim has a semi-width of XXmm in the x direction and XXmm in the y direction.

	j=0	j=1	j=2	j=3	j=4	j=5
i=0	0.000000	-20.943215	-276.110428	16.621889	-5.297765	0.572415
i=1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
i=2	-325.412980	26.350455	-9.501140	1.497224	0.000000	0.000000
i=3	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
i=4	-1.560663	0.598907	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 XX mm in the x direction and XX mm in the y direction.

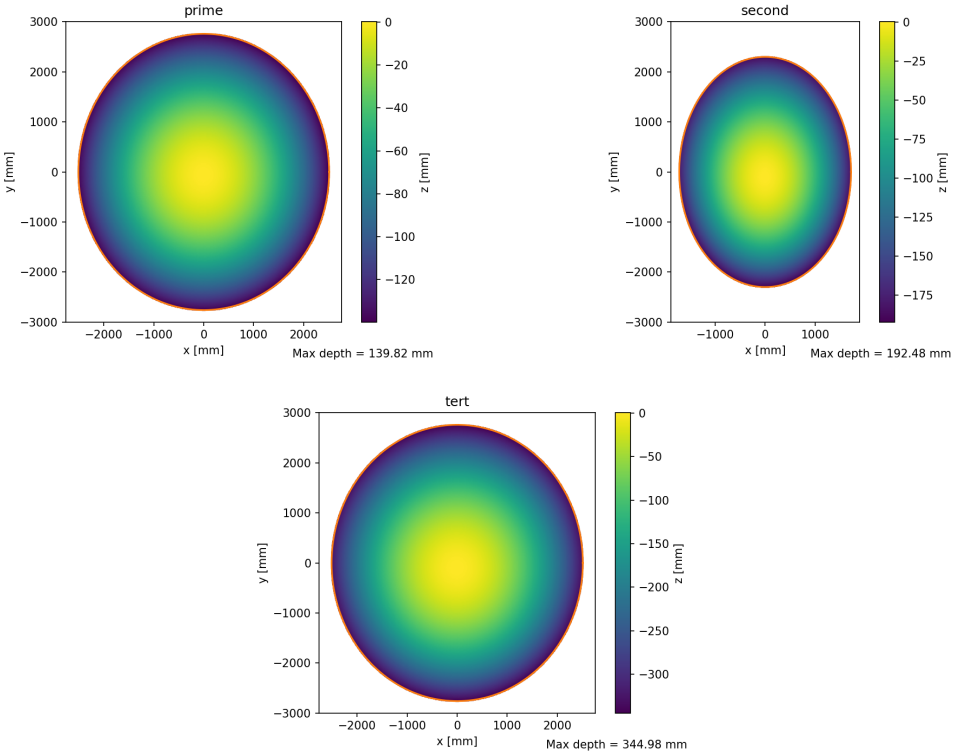

Figure 1: Mirror sag defined with matrix elements accodring to tables 1-3.

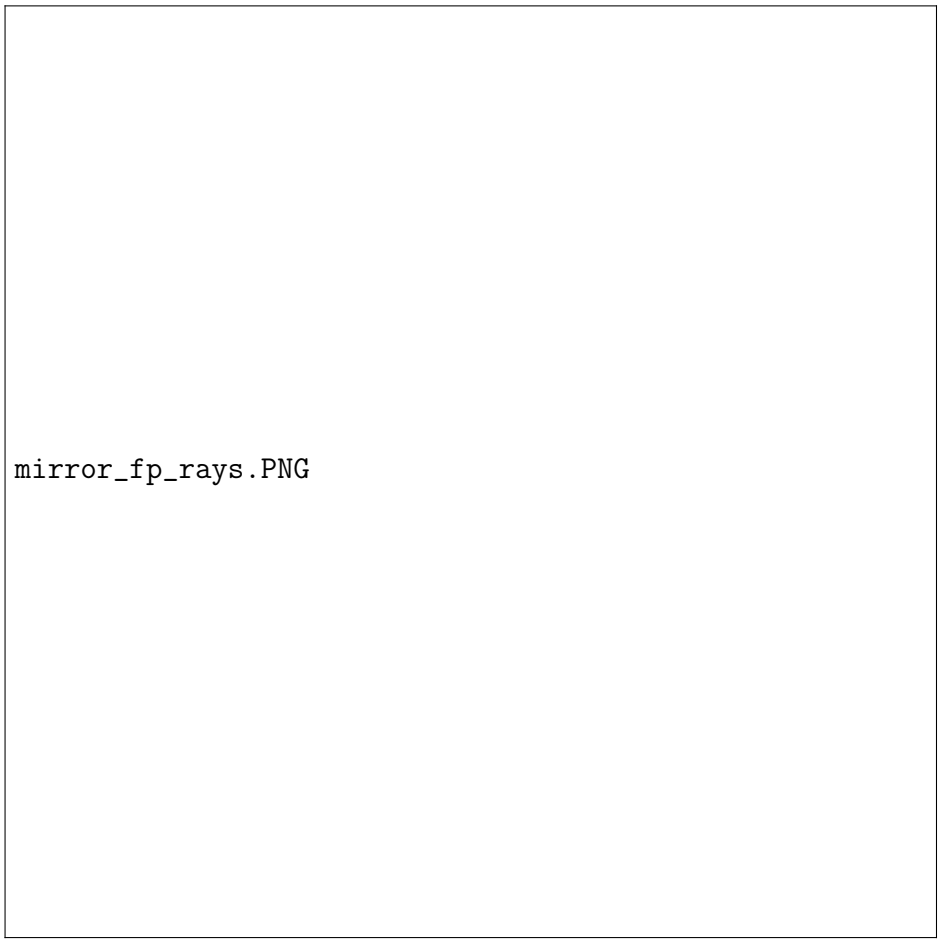

Figure 2: TMP ray trace rendered from a STEP file exported from the Zemax model for the TMP, see `https://github.com/patogallardo/zemax_tools/tree/master/design_analysis/TMAs_202009/TMP_Sm_FixA/step_files`