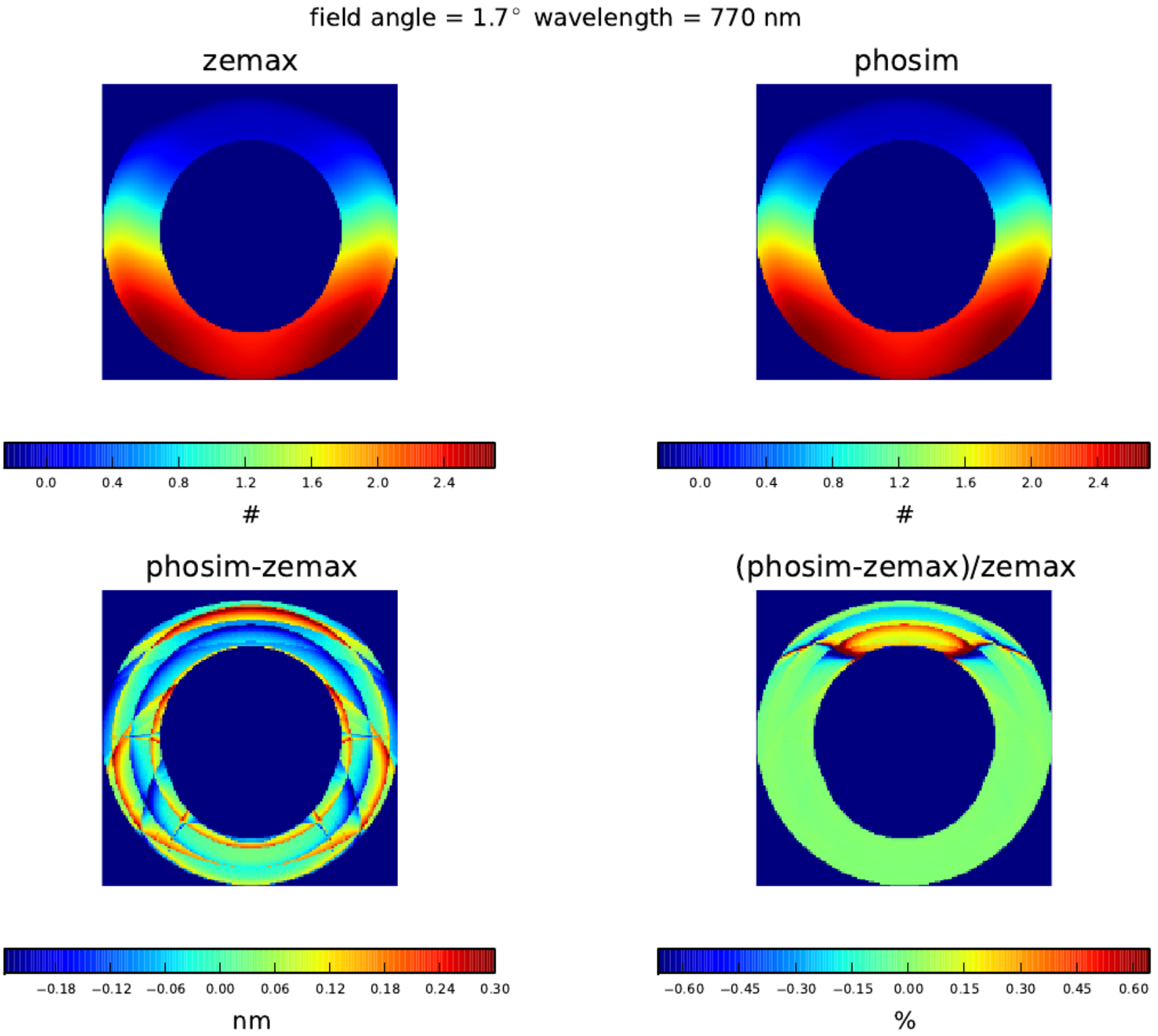
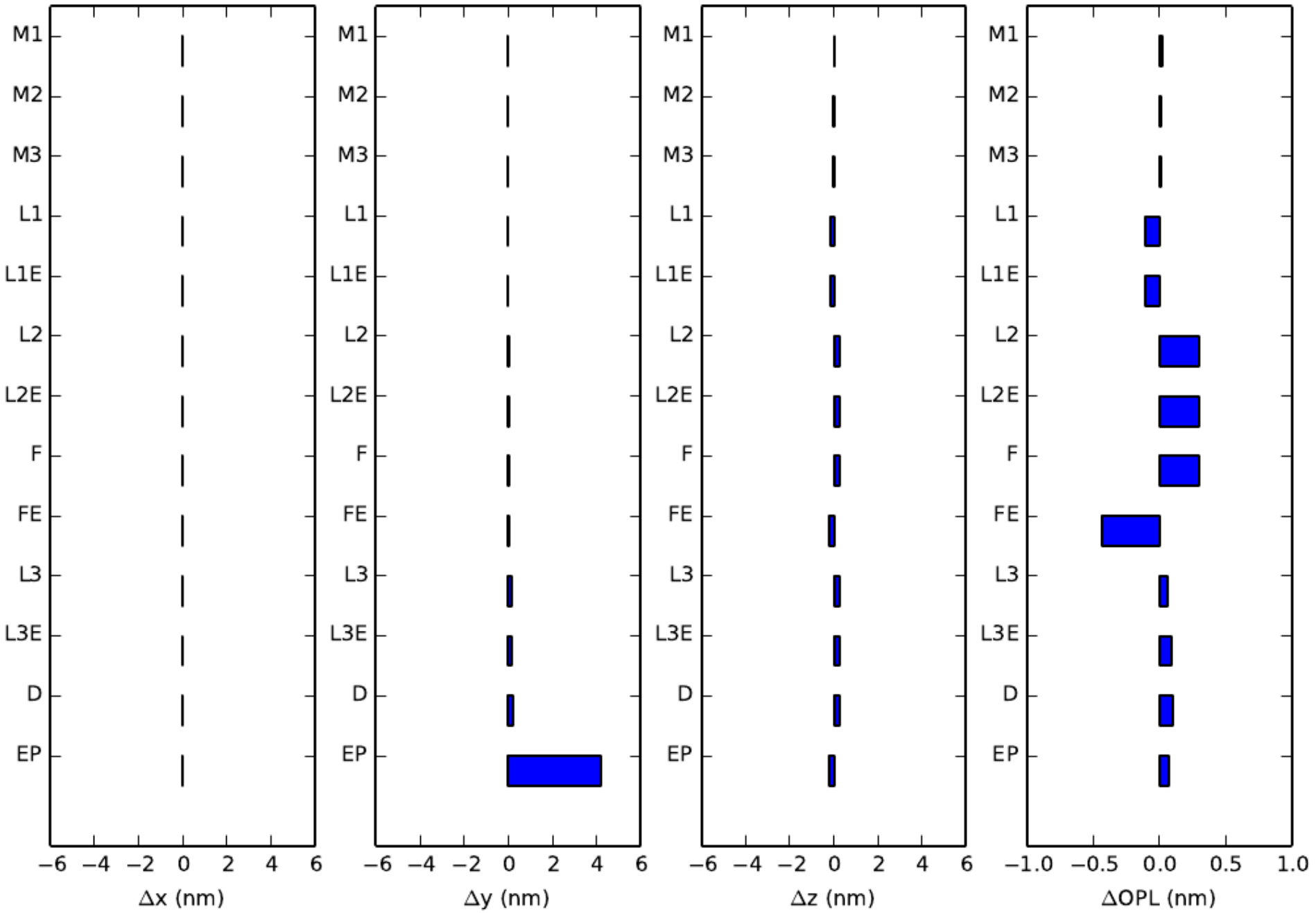
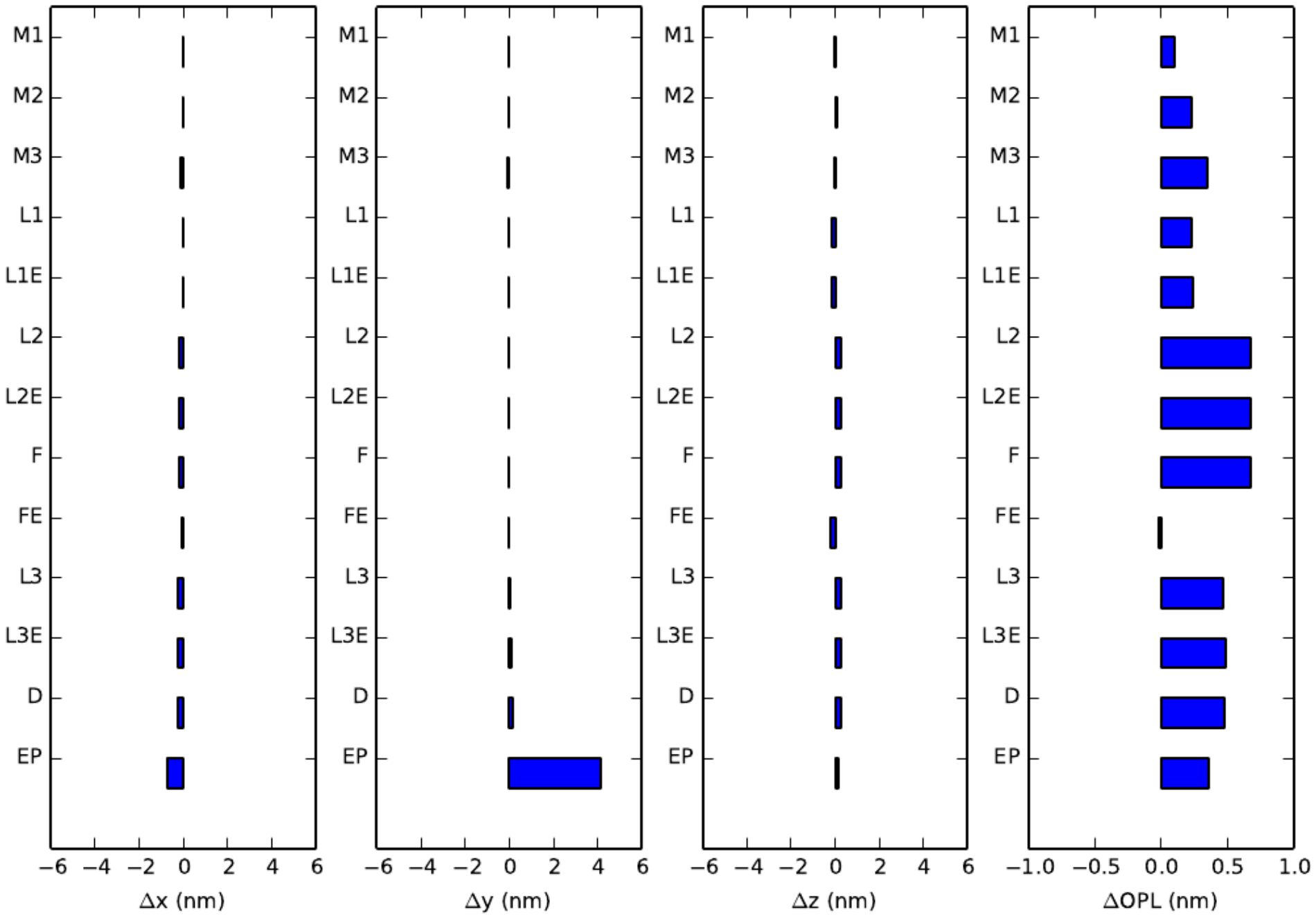
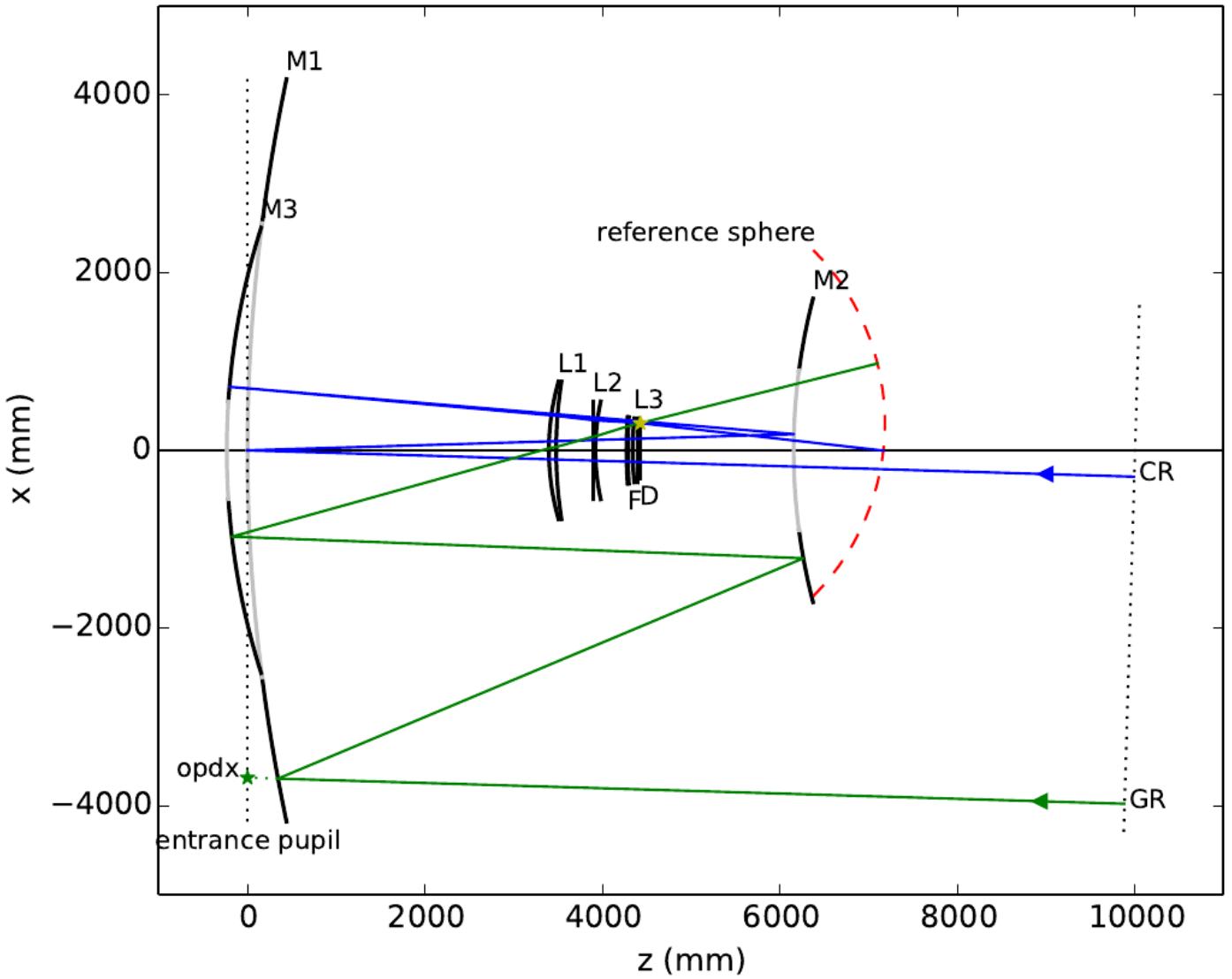

field angle = 1.7° wavelength = 770 nm
zemax
phosim
0.0 0.4 0.8 1.2 1.6 2.0 2.4
#
0.0 0.4 0.8 1.2 1.6 2.0 2.4
#
phosim-zemax
(phosim-zemax)/zemax
−0.18 −0.12 −0.06 0.00 0.06 0.12 0.18 0.24 0.30
nm
−0.60 −0.45 −0.30 −0.15 0.00 0.15 0.30 0.45 0.60
%

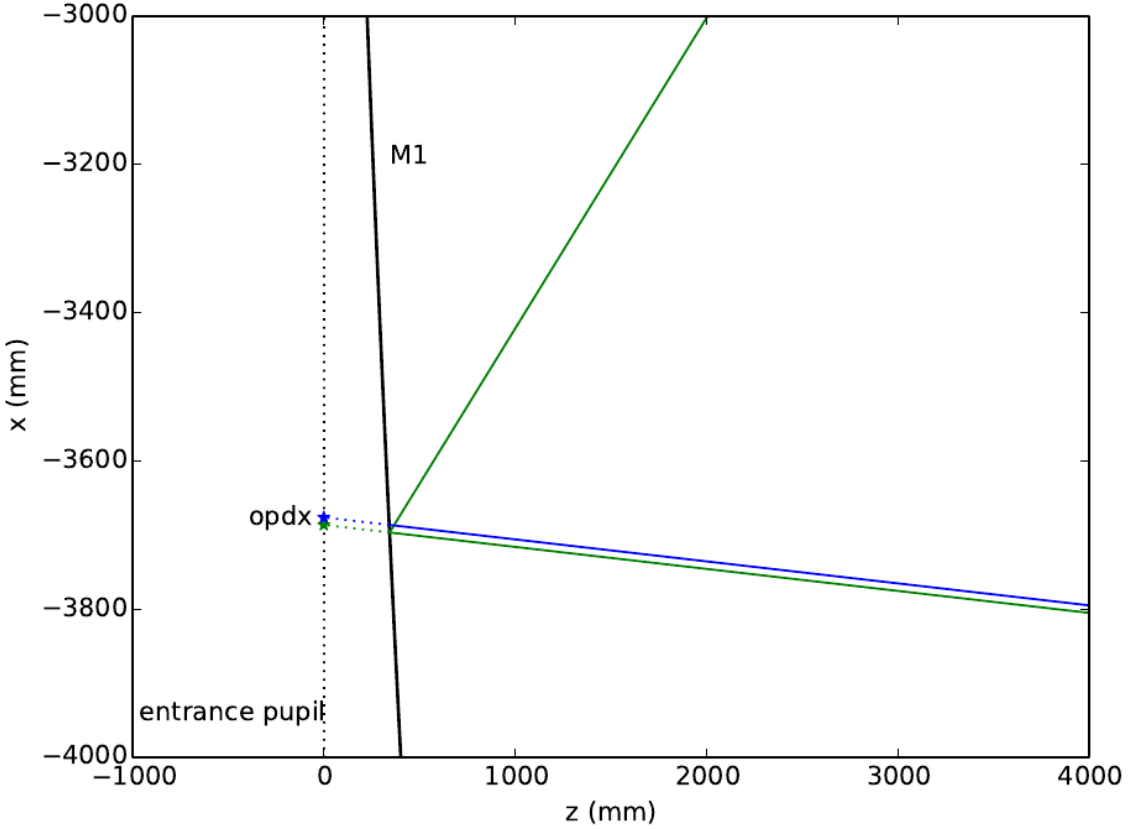

Difference in Ray Position, Chief Ray
M1
M2
M3
L1
L1E
L2
L2E
F
FE
L3
L3E
D
EP
−6 −4 −2 0 2 4 6
Δx (nm)
Δy (nm)
Δz (nm)
−1.0 −0.5 0.0 0.5 1.0
ΔOPL (nm)
$\Delta x = x_{phosim} - x_{zemax}$, OPL = cumulative optical path length


Difference in Ray Position, General Ray
M1
M2
M3
L1
L1E
L2
L2E
F
FE
L3
L3E
D
EP
−6 −4 −2 0 2 4 6
Δx (nm)
Δy (nm)
Δz (nm)
−1.0 −0.5 0.0 0.5 1.0
ΔOPL (nm)
$\Delta x = x_{phosim} - x_{zemax}$, OPL = cumulative optical path length




- Entrance pupil at z=0. Exit pupil 2738.3mm (epR) behind the image plane D (from Zemax).
- Chief ray is the ray entering the center of the entrance pupil.
- Rays come from a tilted plane. Keep tracing them to the image plane and the reference sphere.
- Reference sphere centered on the image point of the chief ray (cx, cy) with radius $\sqrt{epR^2+cx^2+cy^2}$
- OPD map records the difference between the optical path length of each ray and the chief ray using entrance pupil coordinates (opdx, opdy).

Previously




Zemax Ray – **green**
Position on the entrance pupil: (x, 0, 0)

phosim Ray – **blue**
Position on M1: (x, 0, z(x))

Fix: launch ray at z=0 instead of z(x) on M1