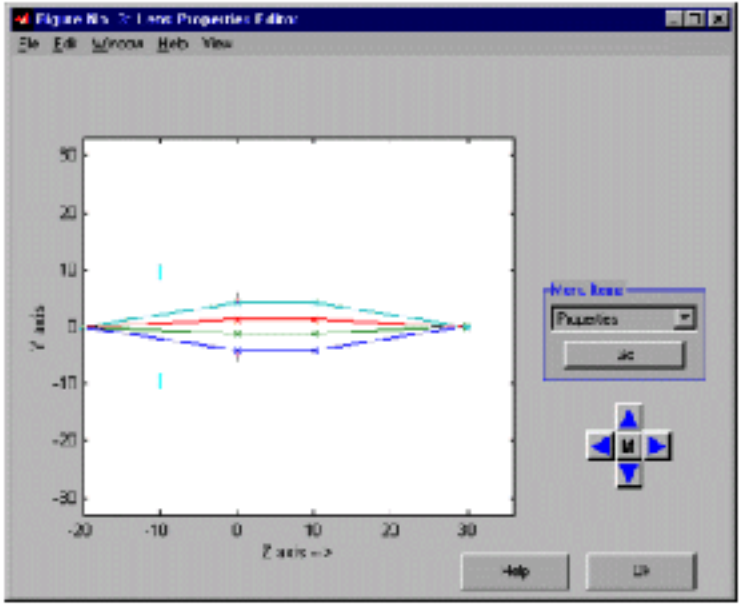
Command Window Functions for the LENS Editor



- When you edit an OPTICS object, the LENS Properties Editor (left) will be displayed. Immediately after this window is displayed, several functions can be entered in the MATLAB Command Window in order to query the properties of the displayed lens.
- If changes are made to the lens in the LENS Editor, the new lens can be querried if the user returns to the view window as shown on the left.

LENS functions:

- pupil
- fir
- sur
- field
- Seidel

The following pages describe each function in more detail. The user can also type "help *function name*" in the command window.

pupil

This function displays first-order pupil information.

```
» pupil

---------- Aperture Information ----------
STON=2   STOD=8.16497;
ENPD=8.16497   EXPD=16.3299;
ENPZ(fr obj)=20  or  ENP THI(fr first elemet)=0;
EXPZ(fr img)=-40.005  or  EXP THI(fr last element)=-40;
FNO(at used)=2.5   NA(img, at used)=0.2;
FNO(Inf)=1.63299
```

- STON - stop number
- STOD - stop diameter
- ENPD - entrance pupil diameter
- EXPD - exit pupil diameter
- ENPZ - ENP distance from object
- EXPZ - EXP distance from image
- ENP THI - ENP distance from first element
- EXP THI - EXP distance from last element
- NOTE: all distances are in lens units (usually millimeters)

fir

This function displays first-order lens information.

```
» fir

---------- First order optics ----------
EFL=13.3333,  BFL=6.66667,  FFL=-6.66667
MAG=-1,  IMD=20,  OAL=10,  TT=50.005
```

- EFL - efective focal length
- BFL - back focal length
- FFL - front focal length
- MAG - system transverse magnification
- IMD - image distance

- OAL - overall length (of lens elements)
- TT - total track (from object to image)
- NOTE: all distances are in lens units (usually millimeters)

sur

This function displays surface information.

```
» sur;
 No.    Radius   Thickness     Index
Sur. 1:  Inf    20   1
Sur. 2:  Inf    0    1
Sur. 3:  20     10   1
Sur. 4:  20     20.005   1
Sur. 5:  Inf    0    1
```

- NOTE: all distances are in lens units (usually millimeters)

field

This function displays field information.

```
» field;

---------- Field Information -----------
YOB=0  YAN=0  YIM=0
```

- YOB - object height along y axis
- YAN - chief-ray angle in y z plane
- YIM - image height along y axis

- NOTE: all distances are in lens units (usually millimeters)

Seidel

This function displays the Seidel aberrations.

```
» Seidel;

---------- Seidel Coef. etc. -------------
 LARG_INV = 0   check:IMD=  20
  SI = 3.472222e-002 ;   W040 =  4.340278e-003;  SA=-8.505173e-002
 SII = 0.000000e+000 ;   W131 =  0.000000e+000; TCO=0.000000e+000
SIII = 0.000000e+000 ;   W222 =  0.000000e+000
 SIV = 0.000000e+000 ;  W220p =  0.000000e+000
  SV = 0.000000e+000 ;   W311 =  0.000000e+000
  CL = 0.000000e+000 ;  W020C =  0.000000e+000
  CT = 0.000000e+000 ;  W111C =  0.000000e+000
```

- LARG_INV - Lagrange invariant
- SI-SV - Seidel coefficients
- W's - wavefront aberration coefficients
- CL&CT - longitudinal and transverse color
- NOTE: all distances are in lens units (usually millimeters)