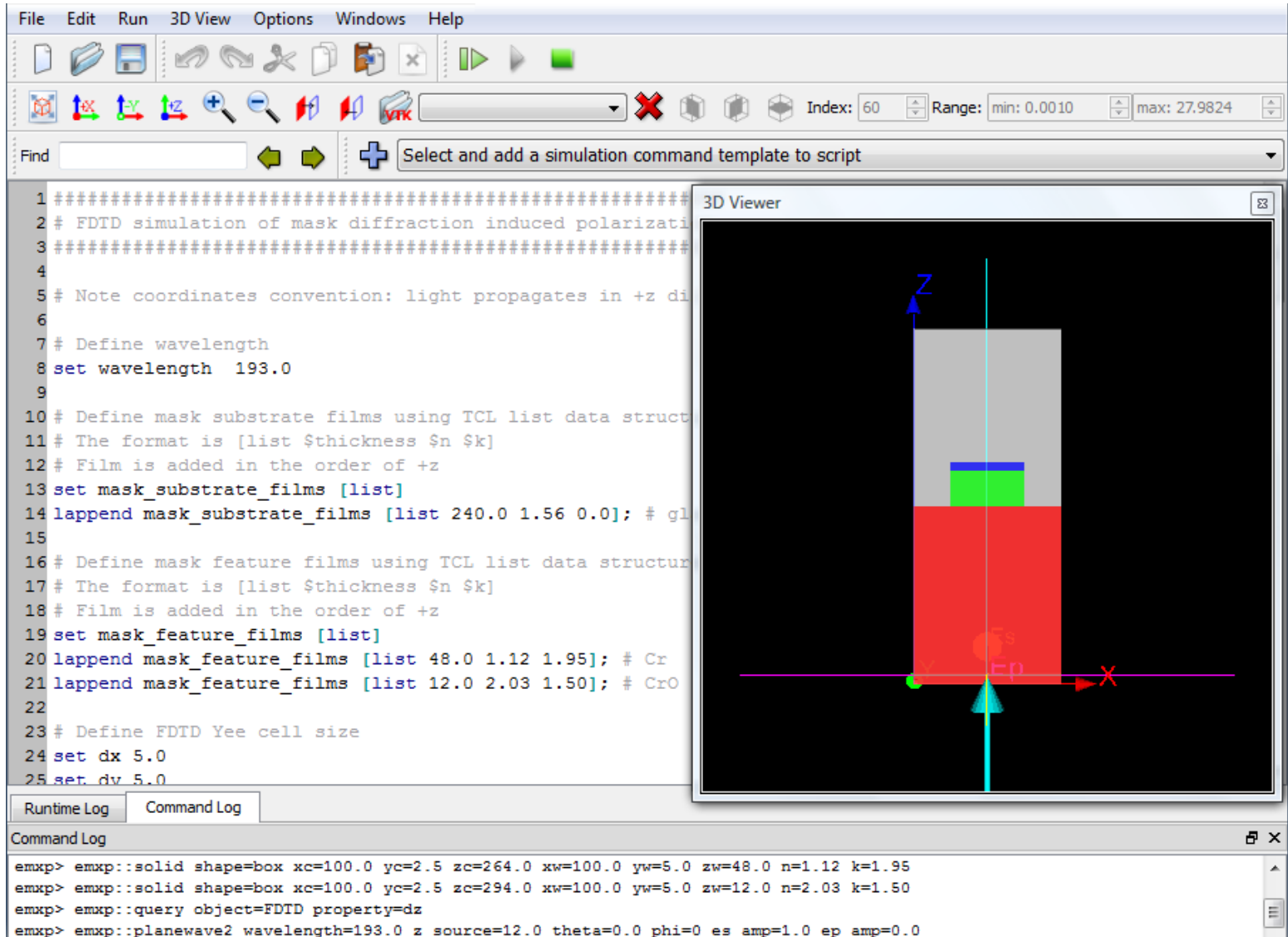


3D Mask Scattering Induced Polarization

Simulation Setup

(Based on Karsten Bubke et al., "Investigation of Polarization Effects on new Mask Materials," Optical Microlithography XVIII, Proceedings of SPIE Vol.5754, 2005)



File Edit Run 3D View Options Windows Help

Index: 60 Range: min: 0.0010 max: 27.9824

Find Select and add a simulation command template to script

```
1 #####
2 # FDTD simulation of mask diffraction induced polarizati
3 #####
4
5 # Note coordinates convention: light propagates in +z di
6
7 # Define wavelength
8 set wavelength 193.0
9
10 # Define mask substrate films using TCL list data struct
11 # The format is [list $thickness $n $k]
12 # Film is added in the order of +z
13 set mask_substrate_films [list]
14 lappend mask_substrate_films [list 240.0 1.56 0.0]; # gl
15
16 # Define mask feature films using TCL list data structur
17 # The format is [list $thickness $n $k]
18 # Film is added in the order of +z
19 set mask_feature_films [list]
20 lappend mask_feature_films [list 48.0 1.12 1.95]; # Cr
21 lappend mask_feature_films [list 12.0 2.03 1.50]; # CrO
22
23 # Define FDTD Yee cell size
24 set dx 5.0
25 set dy 5.0
```

3D Viewer

Runtime Log Command Log

Command Log

```
emxp> emxp::solid shape=box xc=100.0 yc=2.5 zc=264.0 xw=100.0 yw=5.0 zw=48.0 n=1.12 k=1.95
emxp> emxp::solid shape=box xc=100.0 yc=2.5 zc=294.0 xw=100.0 yw=5.0 zw=12.0 n=2.03 k=1.50
emxp> emxp::query object=FDTD property=dz
emxp> emxp::planewave2 wavelength=193.0 z_source=12.0 theta=0.0 phi=0 es_amp=1.0 ep_amp=0.0
```

Degree of Polarization

$$DOP = \frac{\eta_{TE} - \eta_{TM}}{\eta_{TE} + \eta_{TM}}$$

where η = diffraction efficiency

