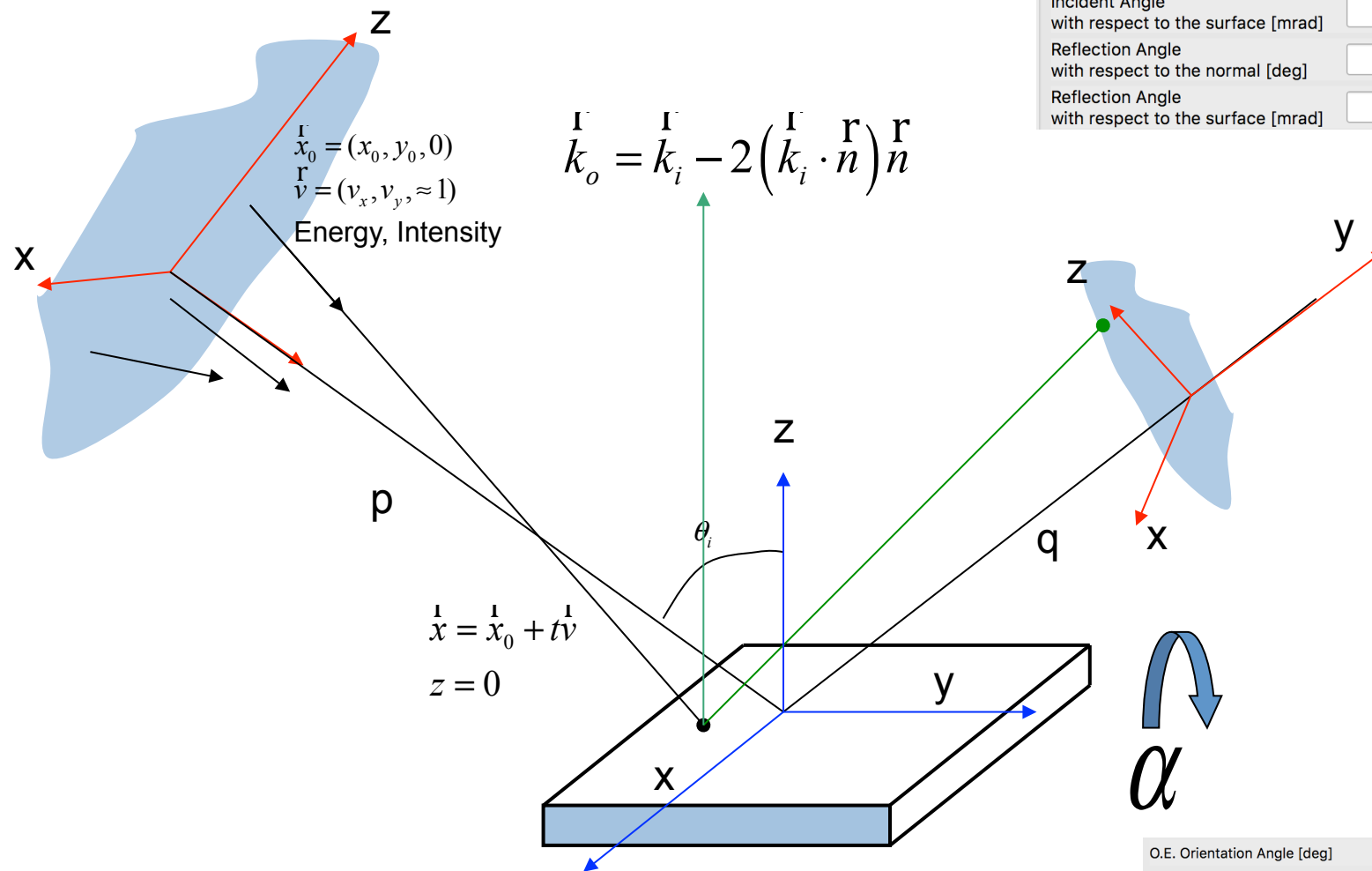


SHADOW

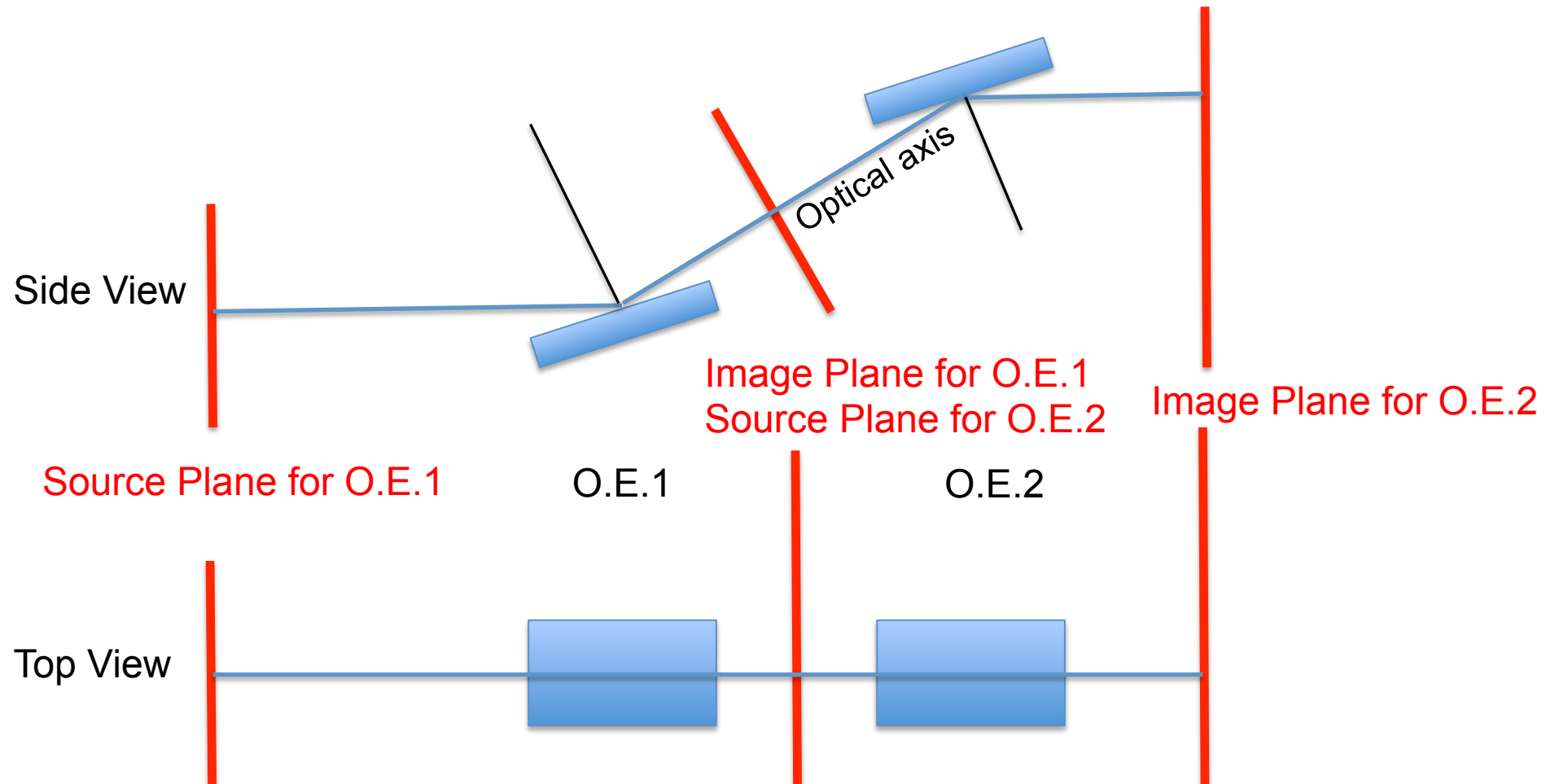
Trace (the beamline)

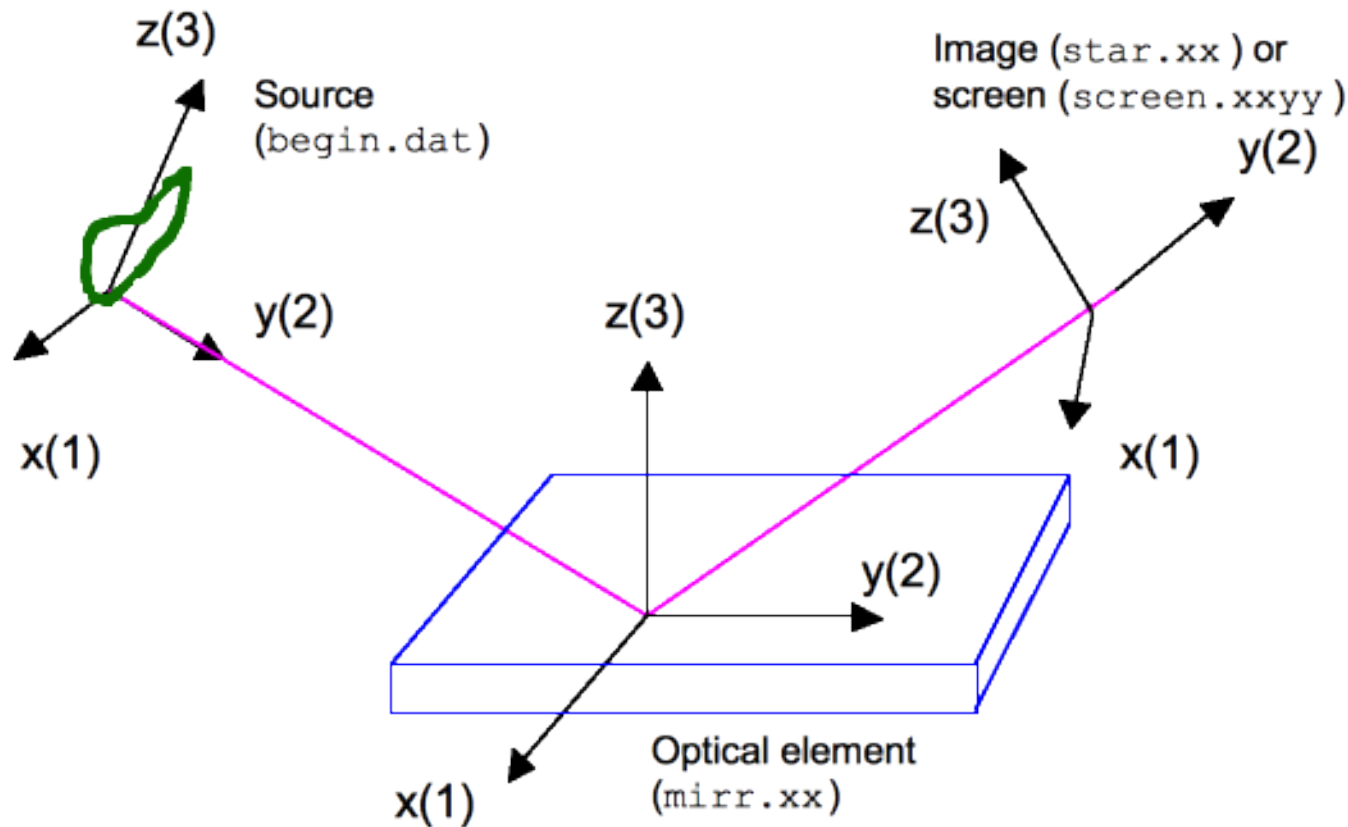


Angles in [deg] with respect to the		Normal
Incident Angle	with respect to the normal [deg]	88.0
Incident Angle	with respect to the surface [mrad]	34.906585
Reflection Angle	with respect to the normal [deg]	88.0
Reflection Angle	with respect to the surface [mrad]	34.906585

O.E. Orientation Angle [deg]
0
90
180
270

Continuation planes





Note that (**VERY IMPORTANT!**):

- The $y(2)$ coordinate is along the beam direction
- The position (Source Plane Distance), orientation (O.E. Orientation Angle) of any o.e. is always referred to the previous one
- Source Plane and Image Plane for each optical element are the "Continuation Planes"
- The frame is rotated if one o.e. is rotated

SHADOW ray's variables (*columns*)

Stored:

1: X
2: Y
3: Z
4: X' *
5: Y'
6: Z'
7: $E\sigma$ X
8: $E\sigma$ Y
9: $E\sigma$ Z
10: Ray Flag
11: Energy **
12: Ray Index
13: Optical Path
14: Phase σ
15: Phase π
16: $E\pi$ X
17: $E\pi$ Y
18: $E\pi$ Z

Computed:

19: Wavelength
20: $R = \sqrt{X^2 + Y^2 + Z^2}$
21: Theta (angle from Y axis)
22: Magnitude = $|E\sigma| + |E\pi|$
23: Total Intensity = $|E\sigma|^2 + |E\pi|^2$
24: Σ Intensity = $|E\sigma|^2$
25: Π Intensity = $|E\pi|^2$
26: $|K|$
27: K X
28: K Y
29: K Z
30: S0-stokes = $|E\pi|^2 + |E\sigma|^2$
31: S1-stokes = $|E\pi|^2 - |E\sigma|^2$
32: S2-stokes = $2|E\sigma||E\pi|\cos(\text{Phase } \sigma - \text{Phase } \pi)$
33: S3-stokes = $2|E\sigma||E\pi|\sin(\text{Phase } \sigma - \text{Phase } \pi)$
34: Power = Intensity * Energy

* X', Y', Z' is the direction vector (unitary), for small angles (always in SR) $Y' < \sim 1$, and X' and Z' can be considered “divergences”

** Column 11 is energy in eV. Internally SHADOW stores the wavenumber $2\pi/\lambda$ in cm^{-1}