Plasmonic Solar Cell Simulation

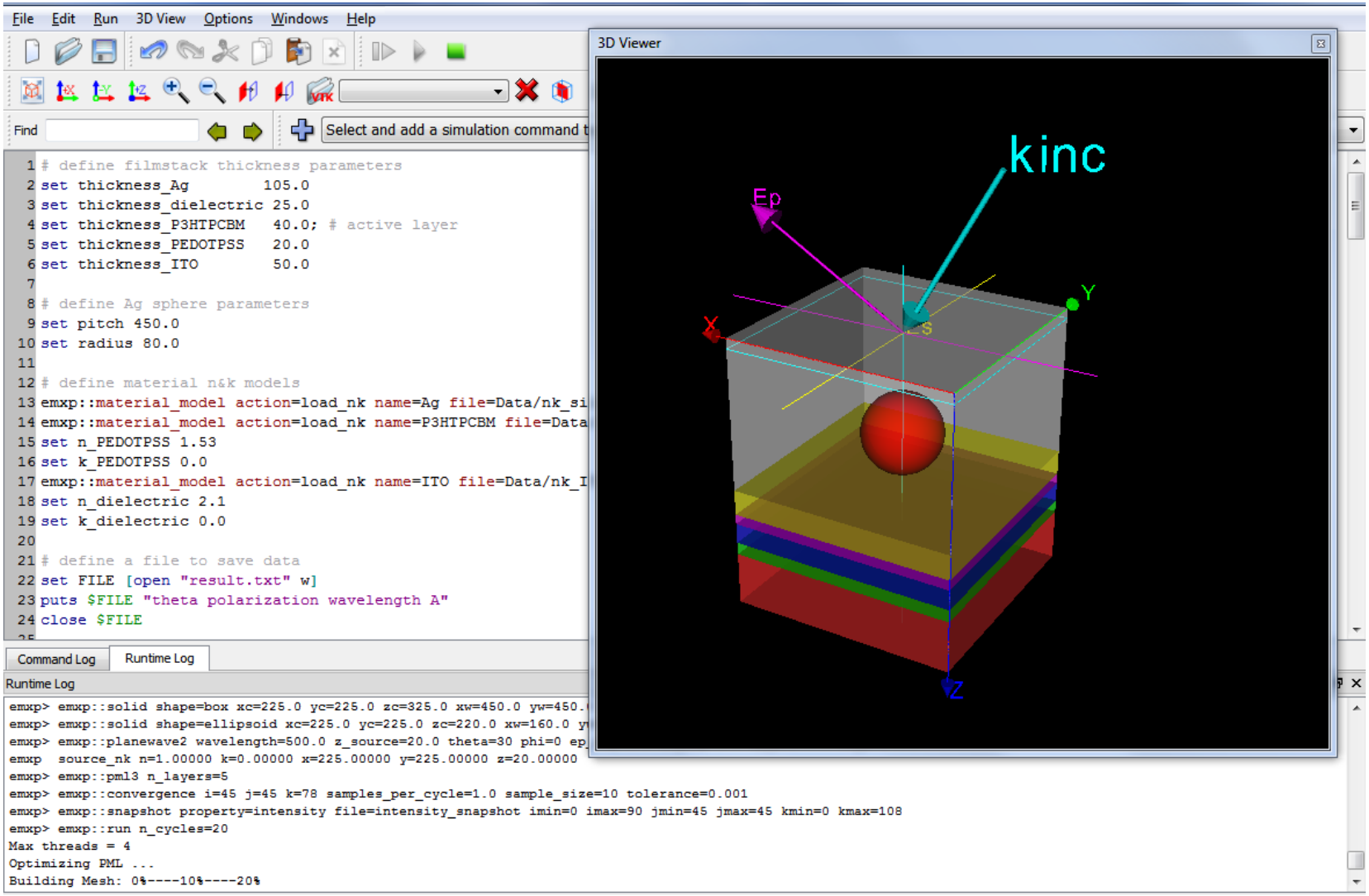
Overview

- This simulation example is based on reference [1]
  - Oblique incidence effect is also investigated in this work in addition to the normal incidence studied in the reference
- It demonstrates the use of the following new EM Explorer commands [2]
  - “poynting_flux” for source power calculation
  - “loss” for calculation of active layer absorption

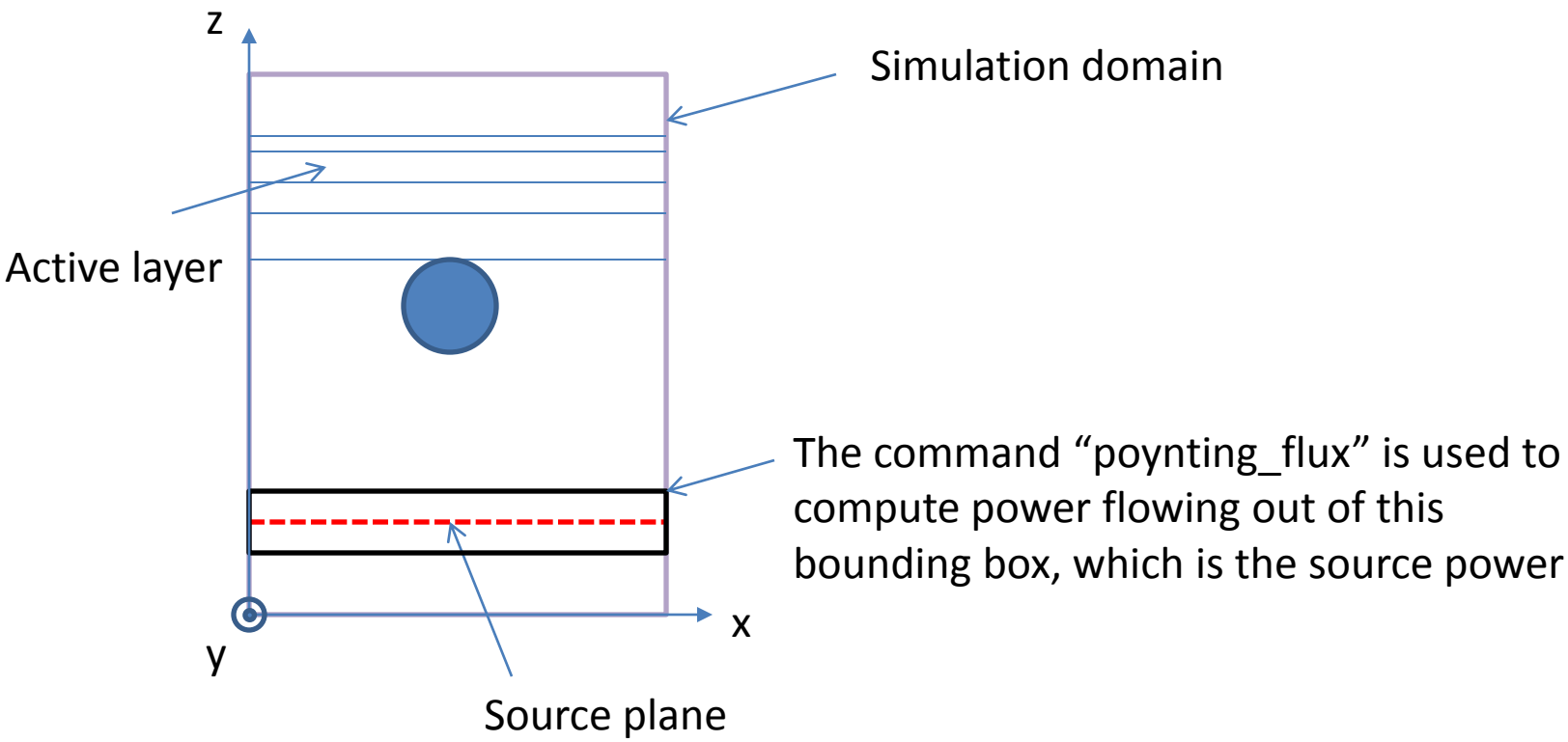
[1] Wenzhen Ren et al, “Broadband absorption enhancement achieved by optical layer mediated plasmonic solar cell,” 19 December 2011/Vol. 19, No. 27/Optics Express 26536

[2] “EM Explorer User Guide,” January 2012, www.emexplorer.net

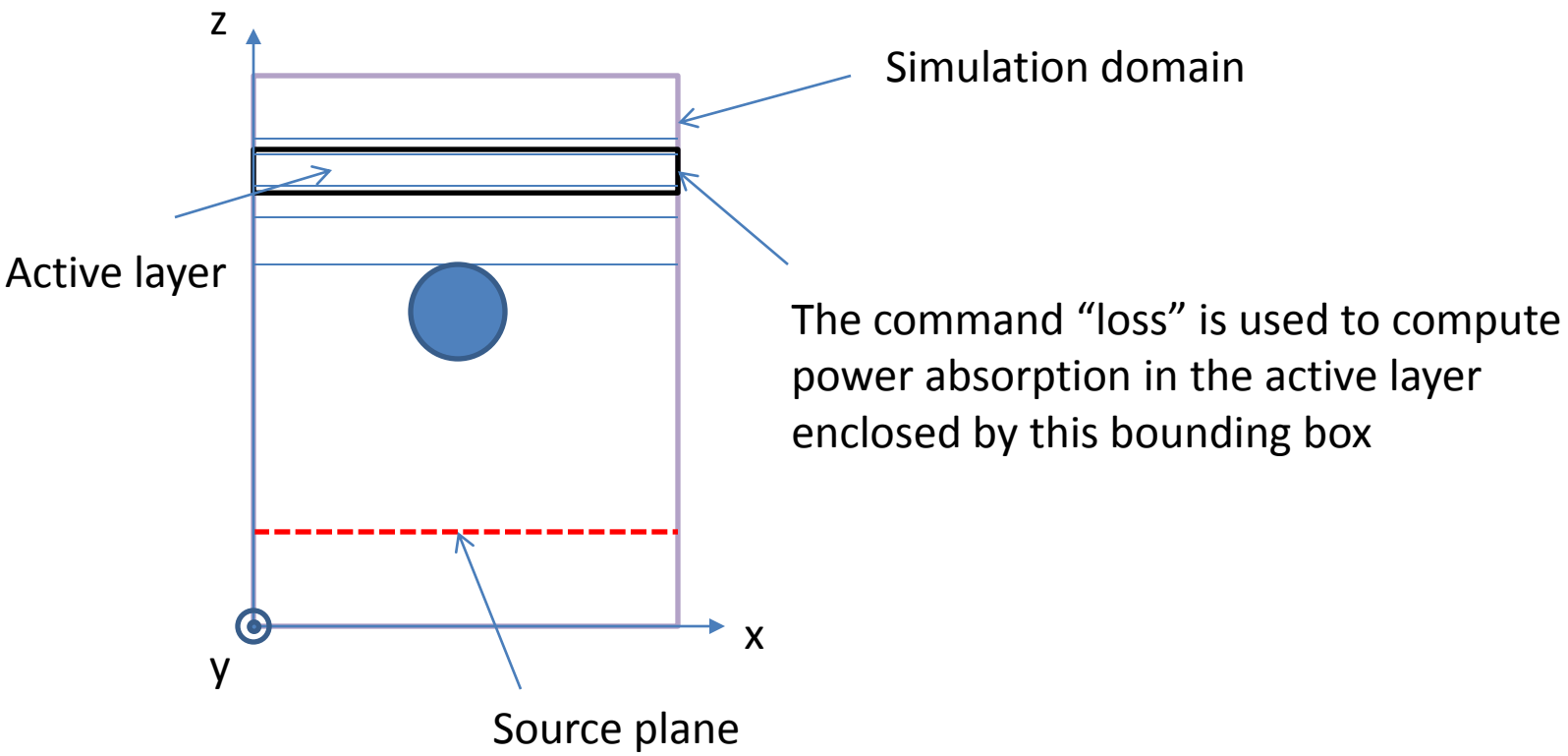
Simulation Setup Screenshot



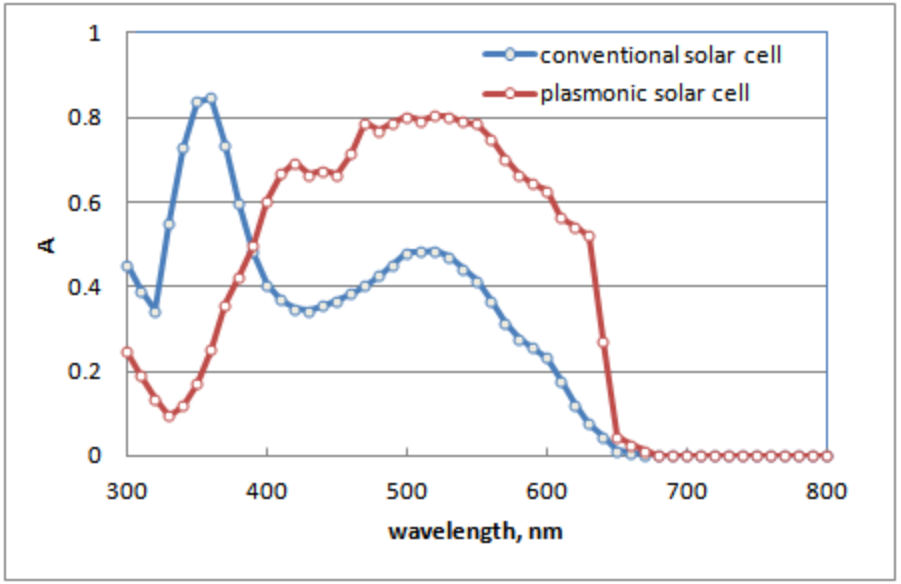
POYNTING_FLUX Command



LOSS Command

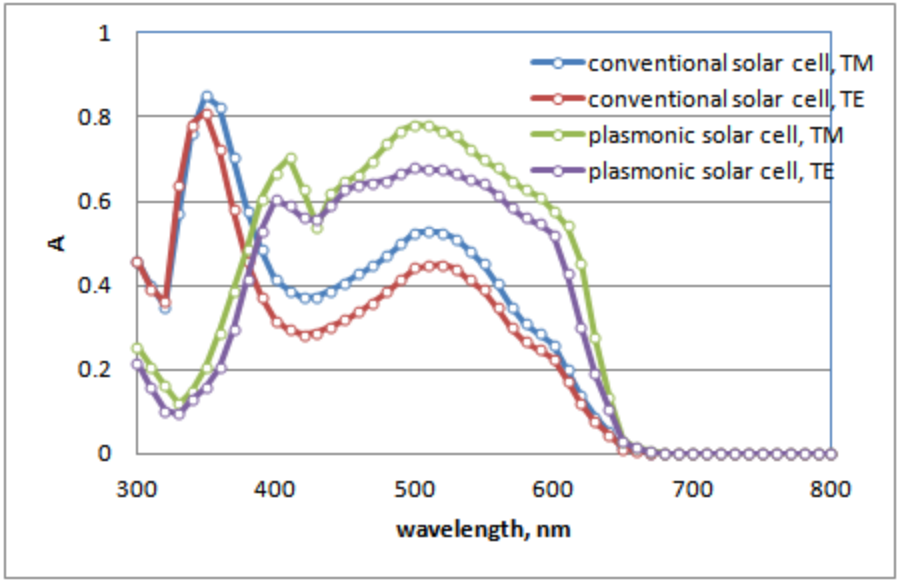


Absorption at Normal Incidence



$$A = \frac{P_{loss}}{P_{source}}$$

Absorption at 30° Oblique Incidence



$$A = \frac{P_{loss}}{P_{source}}$$