Homework 2   due 28 Sept. 2007
PH507 Electrodynamics   posted: 21 September 2007

Reading: Guenther handout, posted notes

1) Calculate an expression for the direction of power flow $\mathbf{S} = \dfrac{c}{4\pi}\mathbf{E}\times\mathbf{H}$ for a wave propagating in a uniaxial crystal with a wave vector $\mathbf{k}$. Calculate the walkoff angle between k and S (or alternatively E and D).

2) As an application, calculate the walkoff angle in a quartz plate with a thickness d. Its optic axis makes an angle of 45° to its faces. A ray of unpolarized light enters normal to the plate and leaves as two separate polarized rays. Given that $n_o = 1.544$ and $n_e = 1.533$ for quartz, find the separation between the two exiting rays.