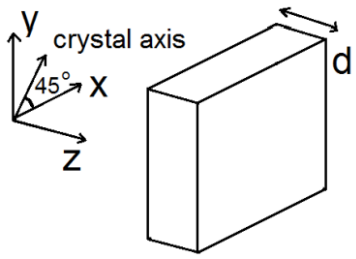
Quiz 13: Anisotropic media II

Consider the following sequence of elements along the z-direction: First an x-polarizer, then a wave-plate, and finally a y-polarizer. We have a circularly polarized plane-wave of wavelength λ=1 μm, propagating along the z-direction, with total electric field amplitude E_0, incident on this system. We look for the electric field vector (direction and amplitude) after each of these elements. The extra total phase-factors in the solution do not matter.

1) What is the electric field vector after the x-polarizer? [2 points]
2) For the wave-plate consider the system shown in the figure:
   A uniaxial crystal of thickness $d = 2.5\ \mu m$, the extraordinary crystal axis is in the x-y plane and makes a 45 degrees angle with the x and y axis. The ordinary refractive index is $n_o = 2.2$ and the extraordinary refractive index is $n_e = 2.1$. What is the electric field vector after this wave-plate? Simplify your result by multiplying it by the phase-factor $\frac{1+i}{\sqrt{2}}$. [6 points]



3) What is the electric field vector after the y-polarizer? [2 points]

You have 10 minutes!

Make sure that you indicate your name and seminar group on your answer sheet.