Which rays are drawn correctly?

A

\[ n_a > n_b \]

B

C
Most light sources emit:

a) un-polarized light

b) polarized light
Total Internal Reflection Fluorescence (TIRF) Microscopy

\[ I(z) = I(0)e^{-\beta} \]

\[ \beta = \frac{\lambda}{4\pi \sqrt{n_1^2 \sin(\alpha)^2 - n_2^2}} \]

\( \lambda \): wavelength of light  
\( \alpha \): incident angle  
\( n_1 \): index of water (1.33)  
\( n_2 \): index of cover slip (1.52)

\[ NA = n \sin(\alpha) = 1.45 \]

\( \beta_{\text{min}} \approx 70 \text{ nm} \)
In what direction is the light polarized after the polarizing filter?

(a) x

(b) y

(c) z

(d) still un-polarized
What is the intensity at the detector?

a) \( I_0 \)
b) \( I_0 \cos(\phi) \)
c) \( I_0 \cos^2(\phi) \)
d) \( I_0 \cos^2(\phi)/2 \)
For right circularly polarized light the projection onto the y-axis is given by:

\[ E_y(x,t) = E_{\text{max}} \cos(kx - \omega t) \]

what is the projection onto the z-axis?

a) \[ E_z(x,t) = E_{\text{max}} \cos(kx - \omega t) \]

b) \[ E_z(x,t) = -E_{\text{max}} \cos(kx - \omega t) \]

c) \[ E_z(x,t) = E_{\text{max}} \sin(kx - \omega t) \]

d) \[ E_z(x,t) = -E_{\text{max}} \sin(kx - \omega t) \]