

Assignment#6, Fundamentals in BioPhotonics 2013

1) % 50

In the figure below (figure 1), a laser is illuminating a hemisphere like object ($d \gg \lambda$) such that the intensity is increasing along $+y$ and $+x$ directions. Using geometric optics determine the direction of the **gradient force** for $n_1 < n_2$.

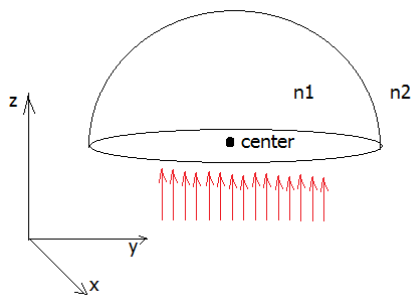


Figure 1

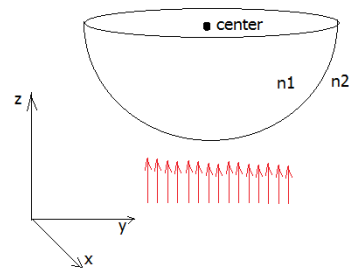


figure 2

2) % 50

Let's reverse the object as seen in figure 2 and put the object inside a lower refractive index environment (still the intensity is increasing along $+y$ and $+x$ directions). Now, find the **scattering force** direction. Would the direction change if we put into an environment with a higher refractive index? [Hint: the scattering force is not in the direction of flow as the illumination is not symmetric]