

Opti 380A – Intermediate Optics Lab I – Fall 2009

Post-Lab Questions for Lab 2: Semiconductor Light Sources II

Post-lab questions are due at the beginning of lecture on the Monday following your lab.

1.) In the laser diode wavelength measurement experiment using the spectrum analyzer, the average wavelength should have changed as the supply current increased. Does the average (mean) wavelength increase or decrease as the supply current increases? Why?

2.) What is the angle of incidence θ required on a single-prism beam expander with refractive index $n=1.6$ to achieve an expansion ratio of 2.5? (Hint: see presentation slides.)

3.) Design a lens system to collimate a $\lambda = 405\text{nm}$ laser diode beam with a circular FWHM divergence angle of 25° . State your design criteria. State the lens diameter and focal length. Search commercial lens catalogs (like: <http://www.edmundoptics.com/>, <http://www.newport.com/>, or <http://www.thorlabs.us/>) to find a lens that matches your design criteria. If you can't find a close enough match, either redesign or state what tradeoffs are necessary for your choice.