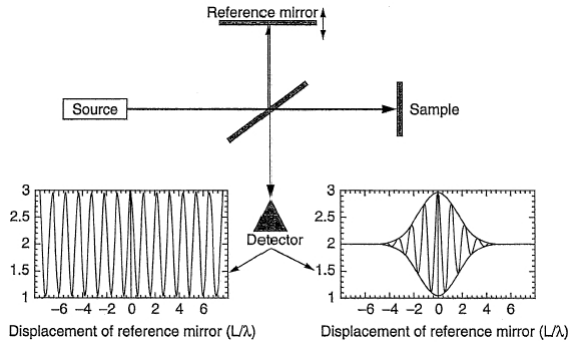
Introduction to Biomedical Engineering

Homework on optical imaging and biomedical optics. Due 12/25

1. In class we showed the principle of optical coherence tomography based on a Michelson interferometer. Use a computer program to simulate the intensity of interference between two equally strong electric fields from the sample and from the reference mirror. First plot intensity versus mirror displacement for a single wavelength at 500nm (similar to the left curve below). Next, assume the light source has a spectrum with a Gaussian distribution and the same center wavelength, plot the intensity versus mirror displacement (similar to the right curve below). Attach your program codes. What is the effect of changing the width of your light source spectrum?



2. Find out how to use absorption spectroscopy to quantify concentration of proteins in suspension and explain how it works. Limit your answer to no more than an A4 page.