

Optical Interferometry - Pre-lab exercise

You can use the lab report template to prepare the submission of the pre-lab exercises. Feel free to use calculations or graphs in your final report, but you don't need to include prelab with the report.

1. Theoretical graph

Plot the theoretical dependence of the air refractive index on the pressure. Assume that in vacuum $n = 1$, and at one atmosphere $p_0 = 76 \text{ cm Hg}$ it is $n_{STP} = 1.000293$. Calculate the slope of this line dn/dp .

2. Error propagation

Find the expressions for the uncertainty of the wavelength measurements, given by Eq.(4) and for the individual refractive index measurements, given by Eq.(5). Discuss the strategy of reducing these uncertainty (assuming that you cannot upgrade the equipment).