

Modern Optics: Homework 20

Due: 30 October 2015

1 Bennett, *Principles of Physical Optics*, 5.37, page 247.

2 Fabry-Perot maxima

Consider a Fabry-Perot interferometer with two mirrors separated by 1.0 mm with air in the gap between the mirrors. Assume that the reflection phase shifts cancel. Laser light with wavelength 632.5 nm is incident on this interferometer. Determine the four smallest angles at which maxima appear (and the value of m for each angle).

3 Fabry-Perot linewidths and resolution

Consider a Fabry-Perot interferometer, with light incident at small angles. One measure of the resolution is the FWHM in terms of δ , i.e. the range of δ values such that the transmitted intensity is half the maximum.

- a) Determine the FWHM when the reflectance is 50%.
- b) Determine the FWHM when the reflectance is 90%.
- c) Determine the FWHM when the reflectance is 95%.