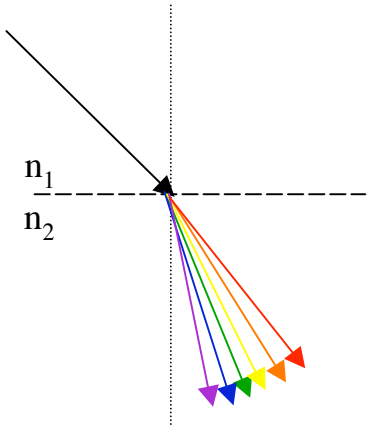
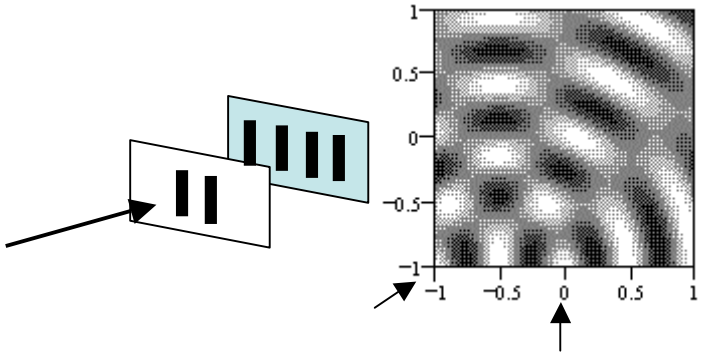
Light-Matter Interactions

3b. Dispersion -

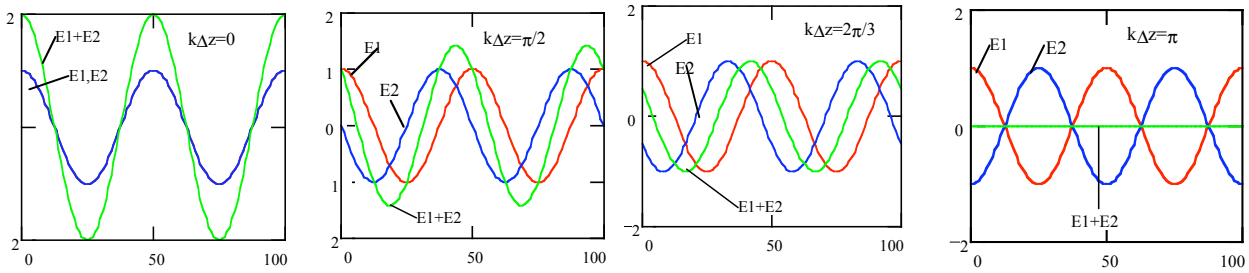


4. Diffraction (=Interference+Scattering)

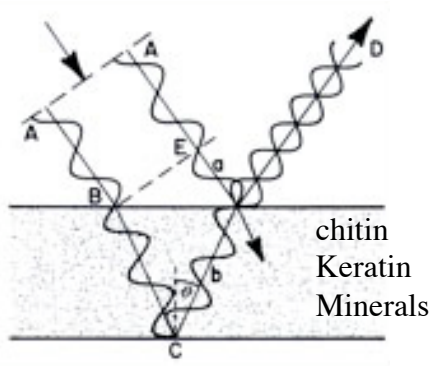


Light-Matter Interactions

Interference



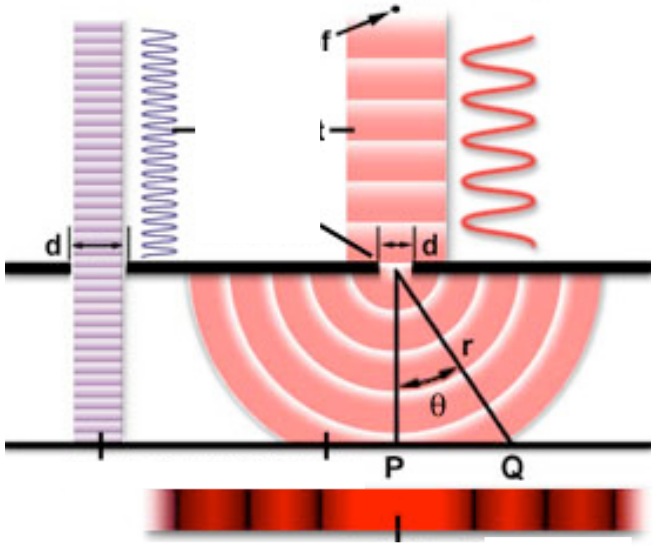
Many interesting optical phenomena are based in interference at thin films:

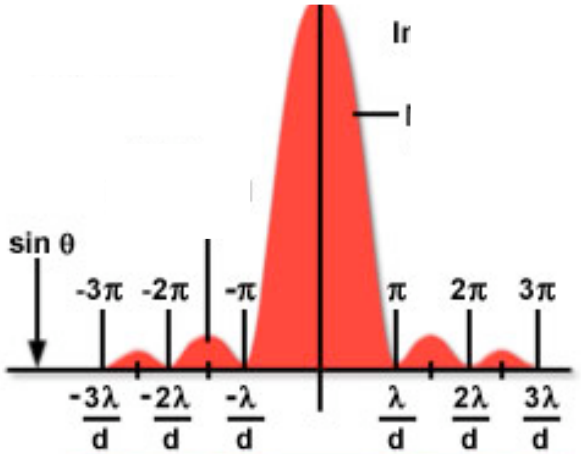


Graphics: *Chi*; http://webexhibits.org/causesofcolor/15F.html

Light-Matter Interactions

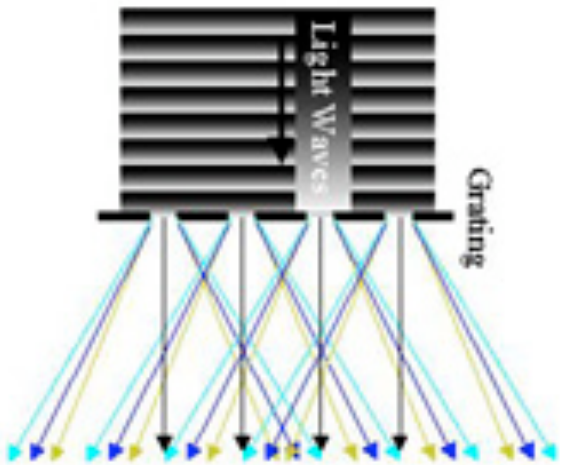
Diffraction of Light Through an Aperture

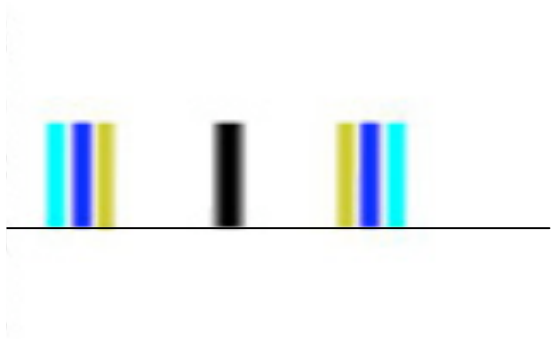




http://micro.magnet.fsu.edu/primer/java/diffraction/basicdiffraction/

Diffraction of Light Through Transmission Grating



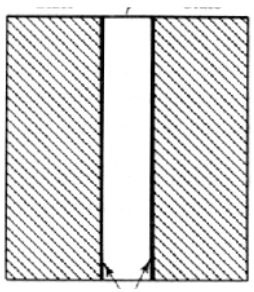


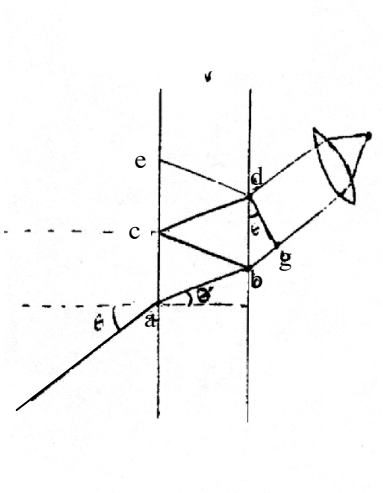
http://www.daviddarling.inføimages/diffraction_grating.jpg

Interference Filter

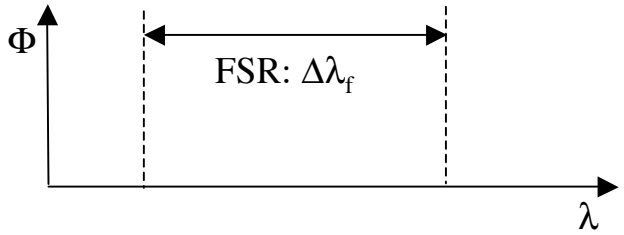
Which EMR λ are passed?

How broad are the lines passed?

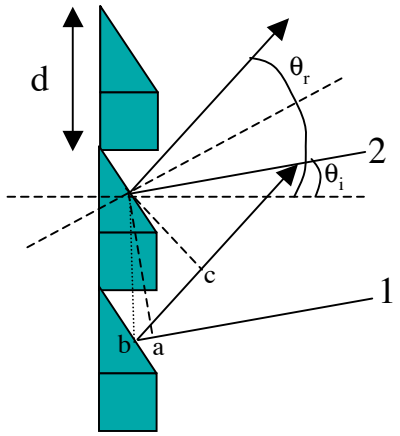




How bright is the EMR passed?



Diffraction Grating



Grating -

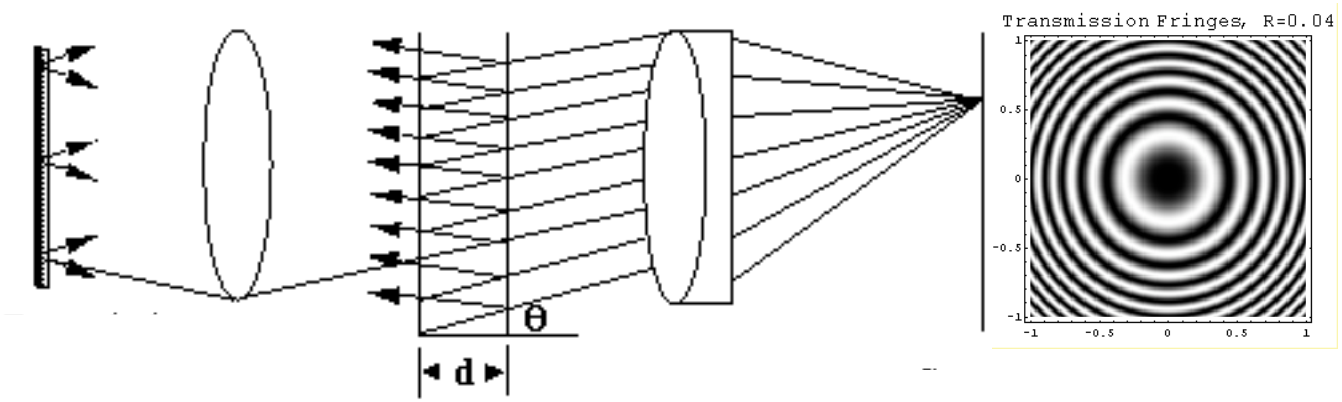
Which EMR λ are passed?

How broad are the lines passed?

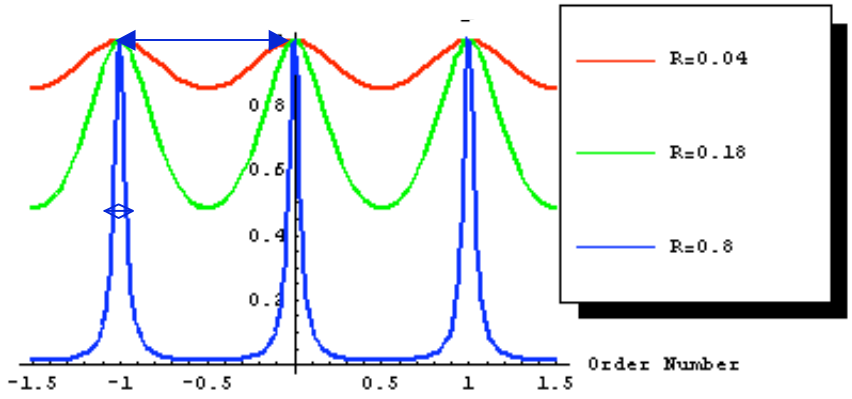
How bright is the EMR passed?

Fabry-Perot Interferometer

Which EMR λ are passed?



How broad are the lines passed?

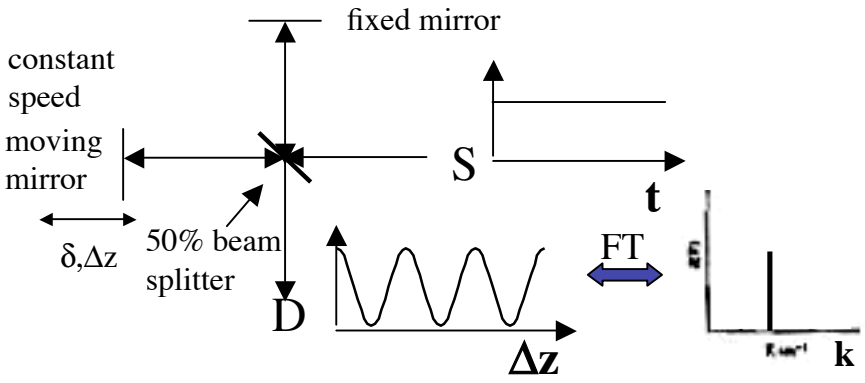


How bright is the EMR passed?

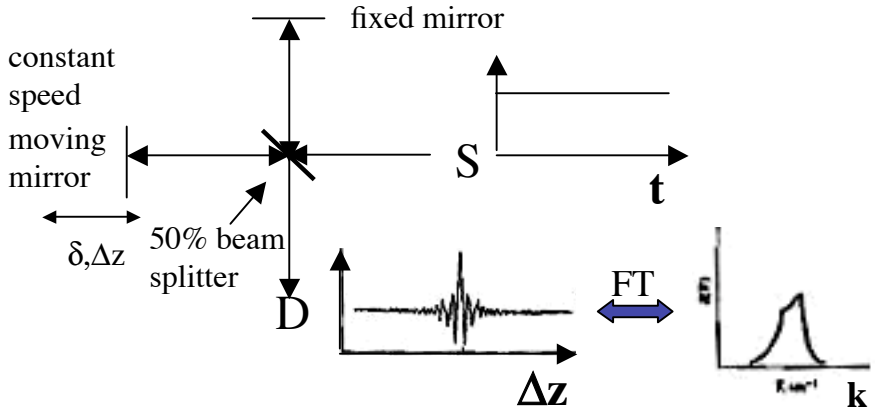
http://wyant.optics.arizona.edu/MultipleBeamInterference/MultipleBeamInterferenceNotes.html

Michelson Interferometer

Interferometer translates high ν of optical radiation (10^{14} Hz) to low ν amplitude oscillations by inducing constructive & destructive interference from the motion of moving mirror.



If S is monochromatic(single λ)source -



If S is polychromatic source, each λ oscillates at a unique frequency, the total is the sum of all λ.