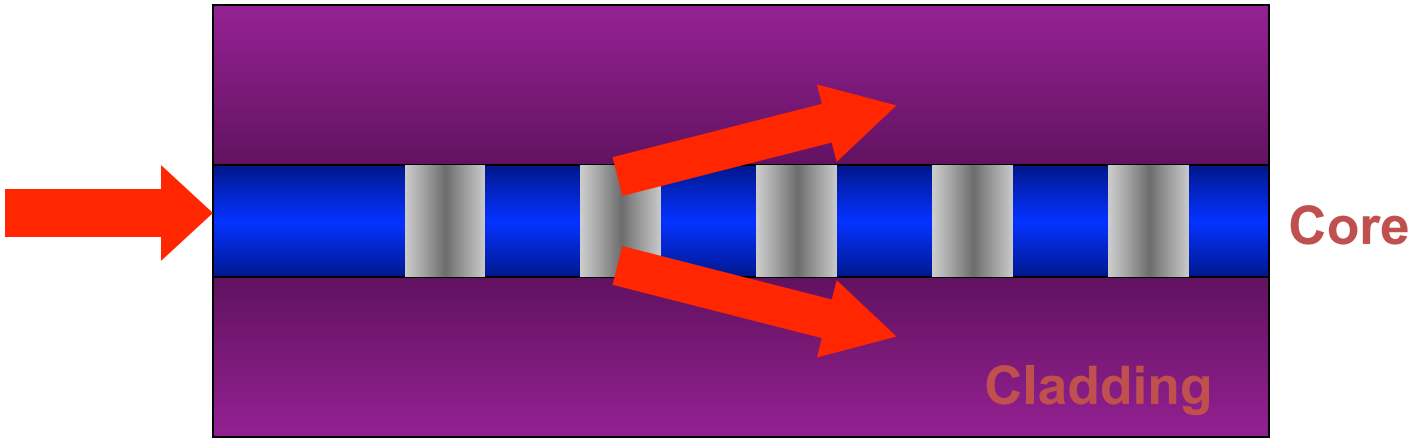
QUIZ: Fibre Gratings

Raman KashyapPolytechnique
Montreal

Long Period Grating QUIZ 1



$\beta_{core} - \beta_{clad} = 2\pi/\Lambda_{grating}$

$= 2\pi(n_{core} - n_{clad})/\lambda$

Weak Disturbance: Long Period Grating

Calculate the approximate period of a LP grating for a fibre with a core-cladding index difference is 4×10^{-3}

Fibre Bragg Grating QUIZ 2

Show that the bandwidth to the first zeroes of a weak refractive index modulation grating is:

$$\Delta f \approx \frac{c}{2 n_{eff} L_g}$$

FBG QUIZ 3

An FBG in SMF28 (Standard) fibre has a 3dB reflectivity at a Bragg wavelength of 1550nm. Assuming that the overlap of the mode with the grating is 80%, calculate kL and the length of the grating if the bandwidth to the first zeroes is 0.2nm. What is the refractive index modulation amplitude?

Additional definition:

$$\kappa_{ac}L = 2\Delta n \pi n_{eff} \eta L/\lambda_B$$

η = overlap factor

n_{eff} = mode index

$2\Delta n$ = ac peak-peak refractive index modulation

L = length of grating

Diffraction: QUIZ 4

Calculate the depth, d, of a grating made in silica glass for the zero-order diffraction to be zero at a UV wavelength of 213nm. Assume the refractive index of silica at the UV wavelength is 1.5. Calculate the diffraction angle, θ, of the +/- 1 diffraction orders if the period, Λ of the grating is 0.5 microns.