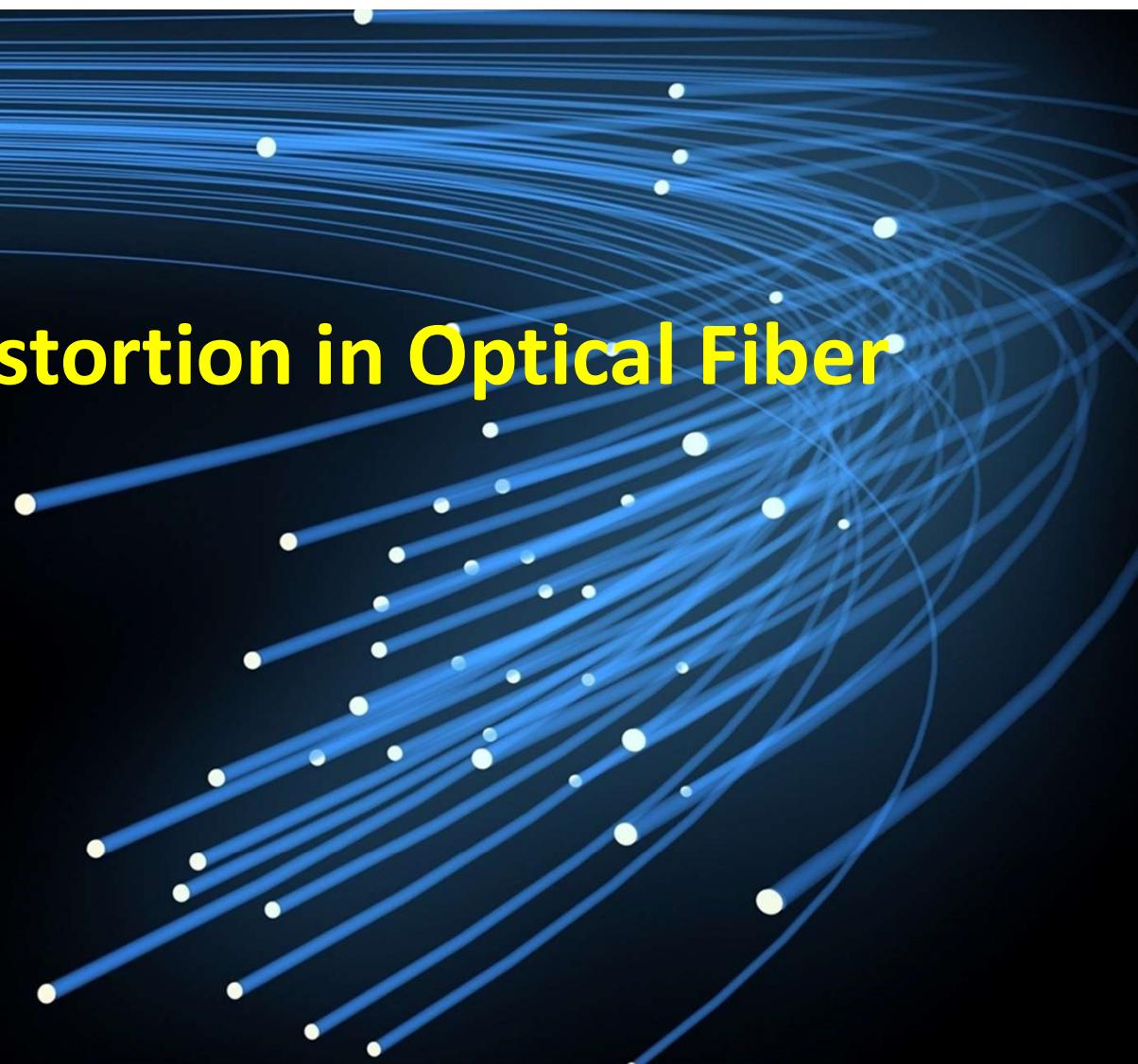


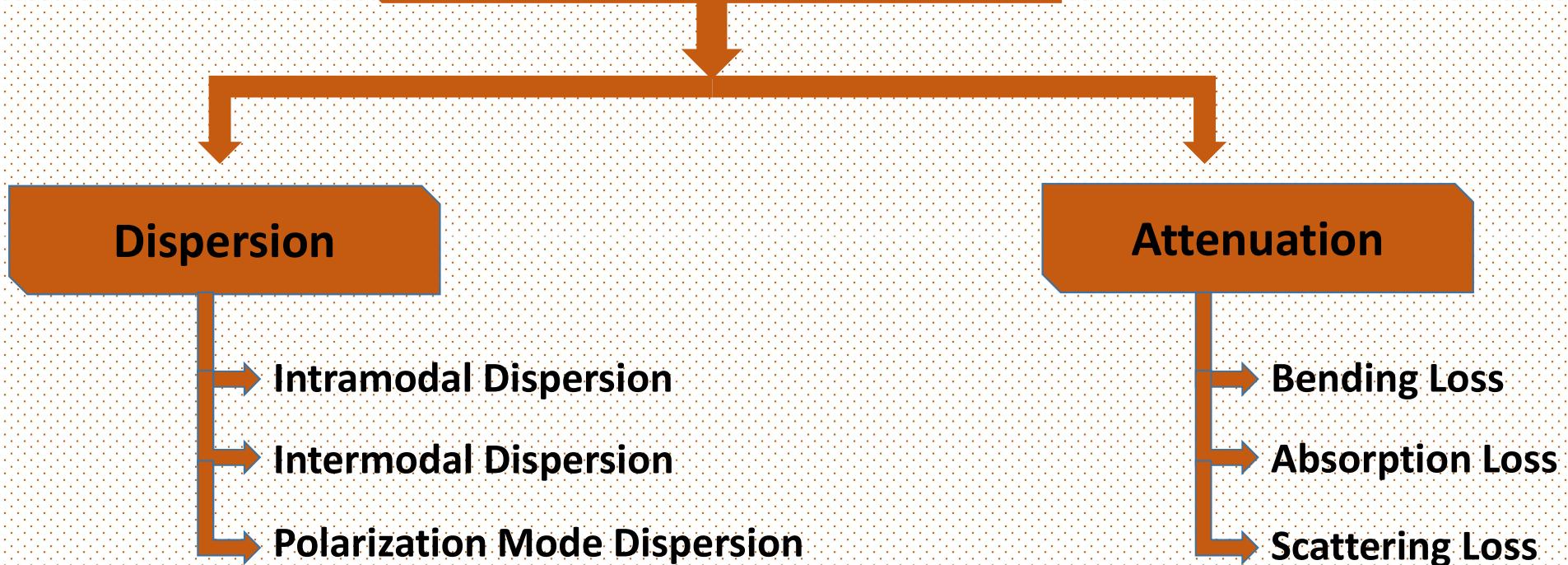
Presentation On

Different Types Of Distortion in Optical Fiber Communication

#Group 3



Distortion in Optical Fiber



Attenuation

- ❖ Loss of Energy when traveling from one point to another
- ❖ Measured in attenuation constant in dB/Wm

$$\alpha \propto L$$

$$\alpha = 10 \log \frac{P_i}{P_o}$$

where,

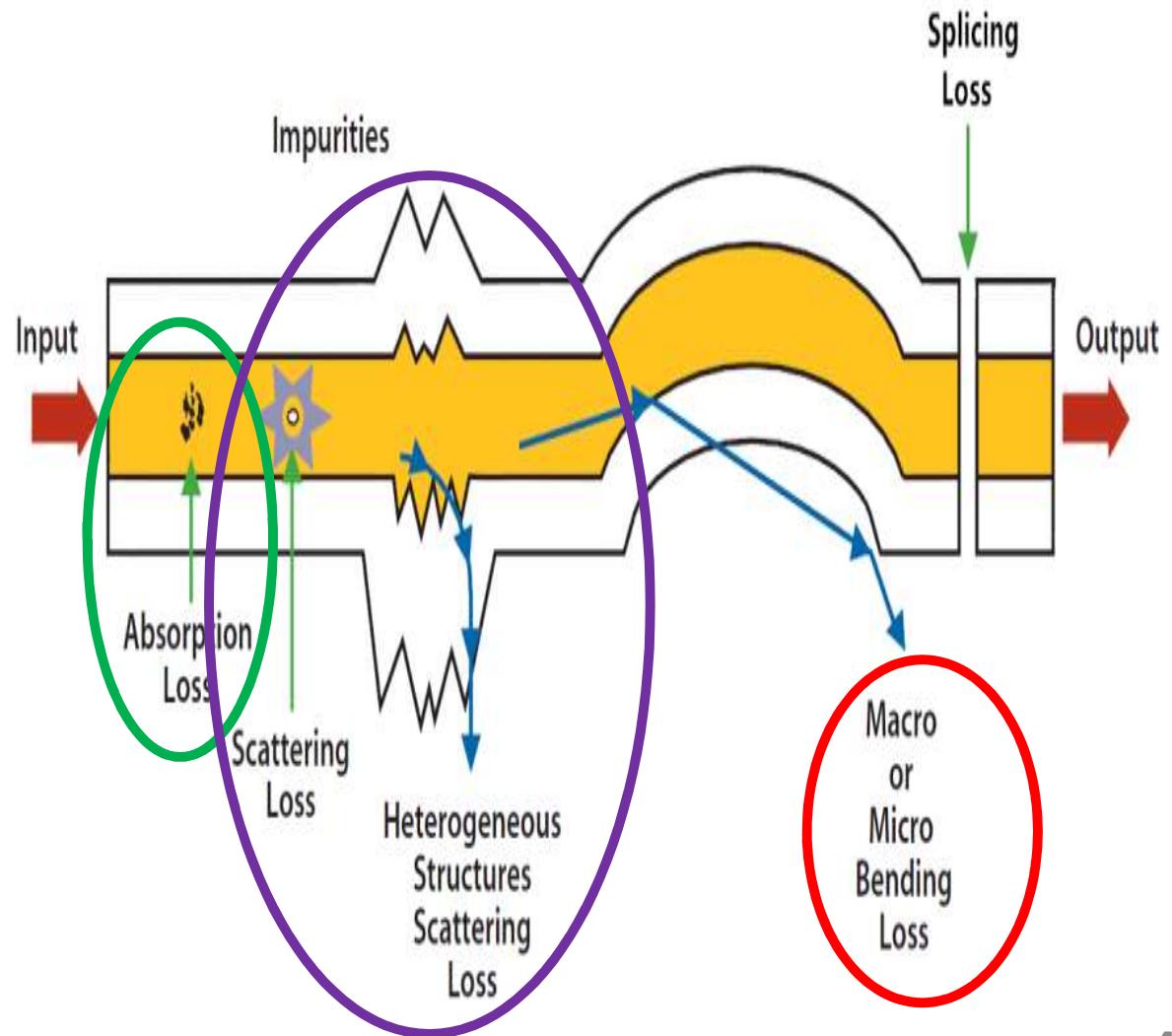
α = Attenuation Constant

P_i = input Power

P_o = output Power

Attenuation

- ❖ Loss Happens due to
 - Bending Loss
 - Absorption Loss
 - Scattering Loss

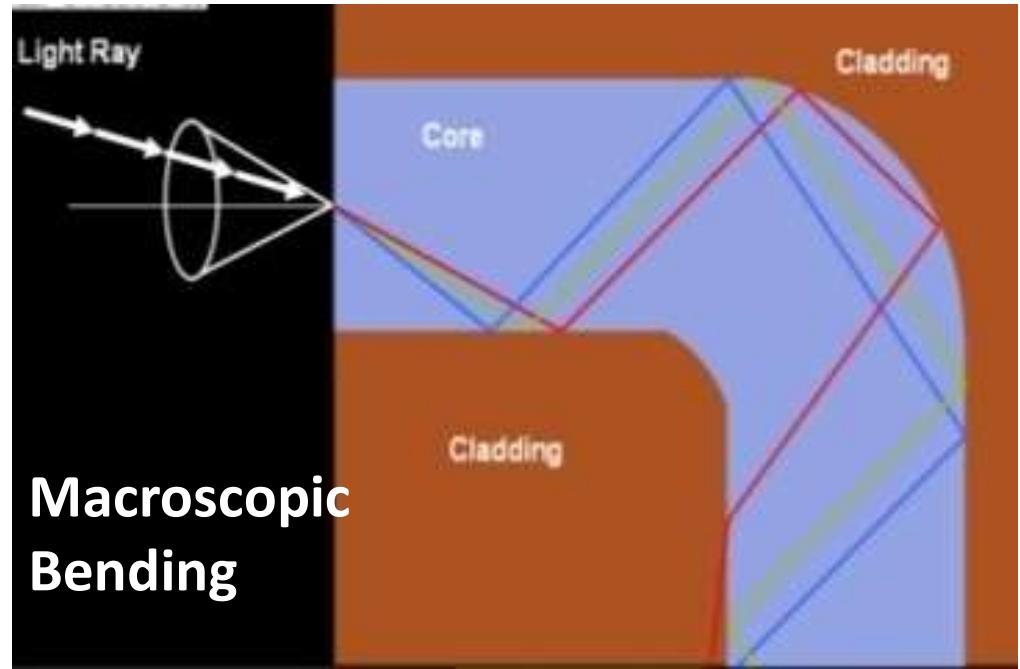


Bending Loss

- ❖ Loss of light energy due to Bending
- ❖ Types Of Bending Loss

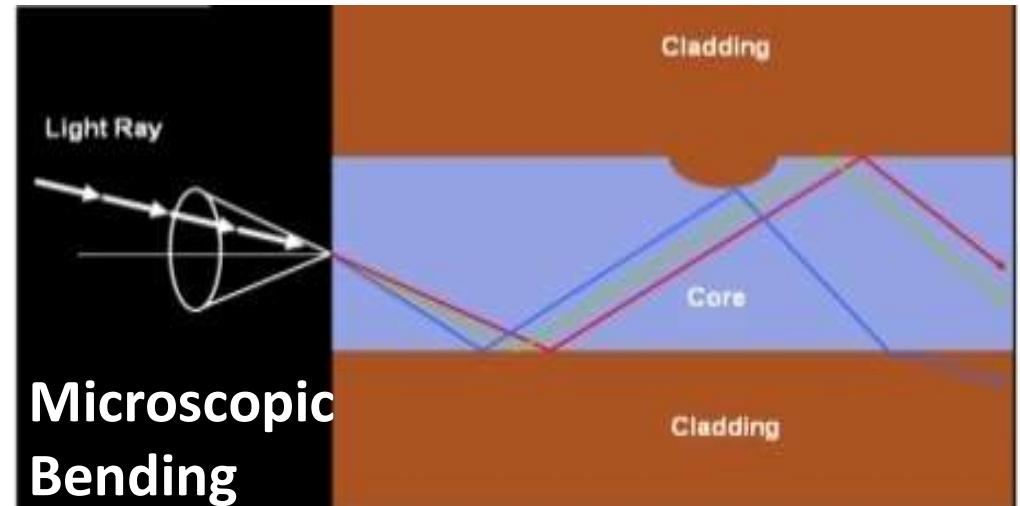
1. Macroscopic Bending

- Completely Bends the fiber



2. Microscopic Bending

- Slightly Bends the core and cladding



Absorption Loss

- ❖ Light is absorbed and loss energy
- ❖ Types Of absorption Loss

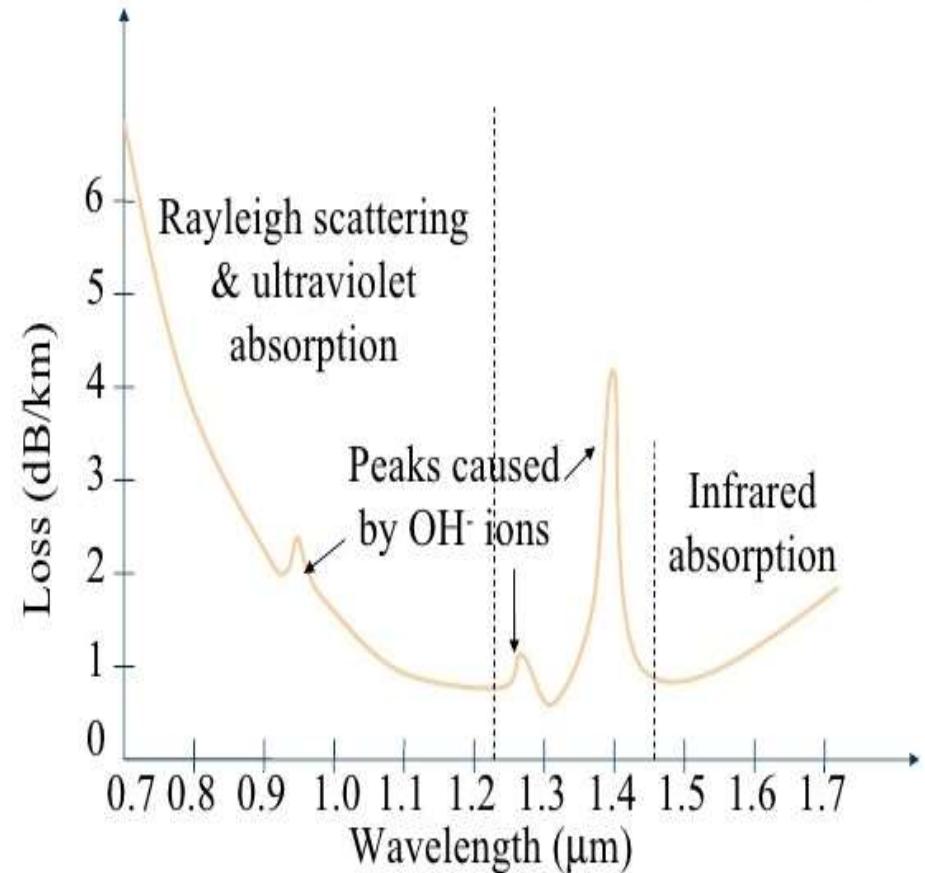
1. Intrinsic Absorption

- Interacts within glass particles and absorb required energy from signal

2.Extrinsic Absorption

- Energy absorbed by external impurities i.e iron,chromium, OH^-

ABSORPTION LOSSES IN OPTICAL FIBER

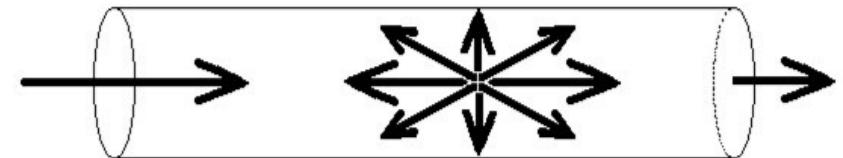


Scattering Loss

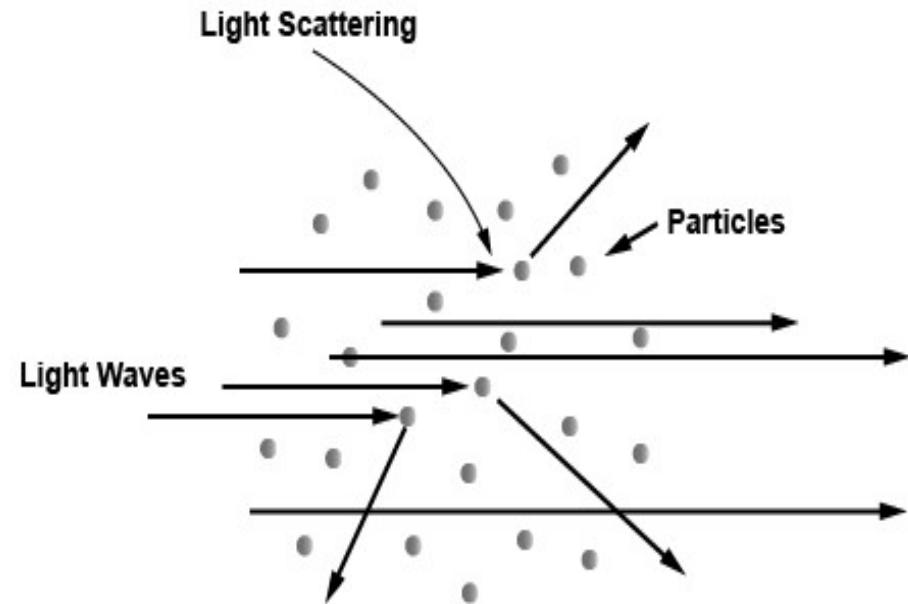
- ❖ Light is hindered and deviates from the path

- ❖ Reasons Behind Scattering Losss

- Microscopic variations in material density
- Compositional Fluctuations
- Manufacturing Defects
- Structural Homogenities



Scattering in Fiber Optic



Reduction Of Losses

- ❑ To Reduce Scattering, The refractive index of core must be increased and perfect manufacturing
- ❑ To Reduce Absorption, Perfect doping is needed
- ❑ Using Multi-mode fiber and perfect fabrication Bending loss can be reduced.
- ❑ High suitable heat Shrinkable tube
- ❑ Insertion loss should be lower than 0.3 dB



Have any Question?

THANK YOU ALL