

BENDING LOSS

Objective: The objective of this experiment is to study bending loss.

Theory:

When ever the condition for angle of incidence of the incident light is violated the losses are introduced due to refraction of light. This occurs when fiber is subjected to bending. Lower the radius of curvature more is the loss.



Procedure:

1. Connect power supply to board
2. Make the following connections (as shown in fig)
 - a. Function generator 1 KHz sinewave output to input 1 socket of emitter 1 circuit via 4 mm lead.
 - b. Connect 0.5 m optic fiber between emitter 1 output and detector 1's input.
 - c. Connect detector 1 output to amplifier 1 input socket via 4 mm lead.
3. Switch ON the power supply.
4. Set the oscilloscope channel 1 to 0.5V/Div and adjust 4-6 div amplitude by using X 1 probe with the help of variable pot in function generator block at input 1 of emitter1.
5. Adjust the amplitude of the received signal as those of transmitted one with the help of gain adjust pot in AC amplifier block. Note this amplitude and name it V_1 .
6. Now replace the previous F.O. cable with 1 m cable without disturbing any previous setting.
7. Wind the F.O. cable on the mandrel and observe the corresponding AC amplifier output on CRO. It will be gradually reducing showing loss due to bends.

Discussions:

1. Explain through sketch how bending loss occur?
2. How is micro bending losses reduced?

References:

1. Gerd Keiser, Optical Fiber Communications, Tata McGraw Hill, 2008.

