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EECS 118: Optical Communication Systems

Problem Set No. 2 : Propagation of Signals in Optical Fibers (Chapter 2 of Text)

Problem 1) Multimode Dispersion Estimate

Problem 2.2 of the text.

Problem 2) Cut-off Wavelength For a Single Mode Fiber

Problem 2.4 of the text.

Problem 3) The Chirped Gaussian Pulse

a) For $\kappa = 0$ in Eq.(2.27) [an initially unchirped Gaussian], deduce equation Eq.(2.28) [for $\kappa = 0$ of course] using the approach discussed in class.

b) Thus demonstrate that the first equation on page 51 is in fact correct [when $\kappa = 0$] and that the equation in the middle of page 54 immediately follows for the band-limited pulse situation. (In problem set 1 you used this to calculate the broadening of a 1 ps pulse (Problem 3)).

Problem 4) Optimal Initial Pulse Width For a Single Mode Fiber With Chromatic Dispersion

Problem 2.13 of the text.