

8.28 A 3 km long optical fiber uses a fiber core with $n_f = 1.51$ and a cladding with $n_c = 1.48$. Compute the maximum data rate and confirm your result using Module 8.2. The operating frequency is 300 THz.

Solution: From Eq. (8.45),

$$f_p = \frac{cn_c}{2ln_f(n_f - n_c)}$$

$$= \frac{3 \times 10^8 \times 1.48}{2 \times 3 \times 10^3 \times 1.51(1.51 - 1.48)} = 1.634 \text{ (Mbits/s)}.$$

The same result is obtained using Module 8.2.

