TFY4195 H2020 - Assignment 4: to be handed in Oct22, 2020

Study lecture VideoLecture 8C and the associated lecture notes. Read also Chapter 10 of PP.

A4-1. Make computer program(s) that calculate(s) the mode dispersion and Ey field component as discussed in the lecture. Use the common communication wavelength 1.55 μm. Take the refractive indices of the layers to be 1.4 and 1.7. Find solutions and plot the Ey-field for at least two situations:

a) A slab thickness giving only one allowed mode (single mode). Find a suitable thickness.
b) A slab waveguide with several modes (say 3 – 5). Find relevant parameters (thickness, N, etc)

A4-2. Find the TM mode dispersion from the Maxwell eqs as for the TE case. Repeat a) and b) for this situation (calculate the Hy-field). Are the effective indices the same for the same thickness?

Challenge: calculate also the Ex and Ez fields for the TM mode. What can we say about the continuity of the calculated Ex field at the interfaces $x = 0$ and $x = b$ for the TM mode?