3.1 Waveguides

Matlab program

A rectangular waveguide R100 (dimensions 22.86 mm x 10.16 mm) is analyzed by the Matlab program `waveguide.m`. This program (plus all the necessary additional m-files) is available here. We run Matlab and set the path to the folder **Waveguide**. Writing `waveguide` to the command window of Matlab, the program is started. Handling program can be subdivided to following steps:

1. Number of rectangular bi-elements, sampling the waveguide cross section in the direction x, is written to the input line number of elements in x, and number of bi-elements in y is written to the input line number of elements in y. If transversally electric modes are going to be computed, the button Modes TE has to be pressed. If transversally magnetic modes are going to be computed, the button Modes TM has to be pressed.
2. If the elected analysis is finished, a dialog containing the input line **Mode number** appears. The lowest mode is denoted as "1", higher modes are numbered by rising integer index (modes are sorted according to the value of the critical frequency). Pressing the button Draw, three graphical windows are opened: the first one displays distribution of the longitudinal component, the second one and the third one display transversal components of field intensities.
3. Program is finished by pressing the button End.

Program `waveguide` analyzes EM field distribution in a waveguide by the finite-element method. A brief description of this method is given in the layer D.