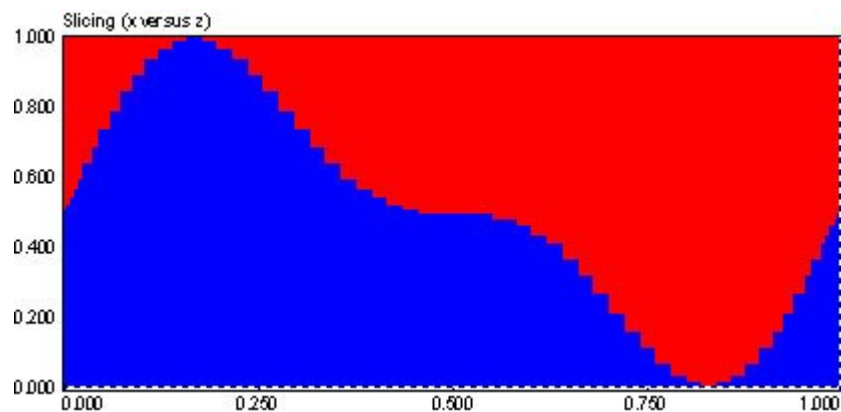


Special Features

UNIGIT is a sophisticated diffraction solver code for gratings with periodicity in one (line gratings) or two dimensions (crossed gratings). It is based on Lifeng Li's RCWA-approach or as he calls it MMFE (modal method with Fourier expansion). The code offers a variety of unique features. It is recommended to check it out just by downloading and running the [Demo](#) code.

Slicing

Due to the underlying algorithm of the RCWA, arbitrary interfaces have to be sliced resulting in thin slices with flat interfaces and normal internal boundaries between the different materials. This results in a stair case approximation of the profile. In order to achieve a sound trade-off between the approximation of the actual boundary conditions of the electromagnetic fields and computation cost, the step size of the slices should be kept constant. This means that the slice thickness depends on the local slope of the profile, i.e., a steep slope results in a thick slice whereas a shallow slope requires thinner slices. UNIGIT offers an universal automated slicing routine. The sliced profile can be immediately visualized.



Dispersion

The dispersion properties of the materials can be fully taken into account. This can be done either by reading an index file that contains n and k values for specified wavelengths along with an interpolation or by means of dispersion formulae such as Sellmeier or Cauchy. A few $n&k$ -files and dispersion coefficients will be provided with the code. The user can easily create his own materials according to his needs.

Substacks

The grating stack can be built from different types of basic layers (see document „Underlying theory“). In order to facilitate the stack edition, parts of a stack can be reused. To this end, the required layers have to be marked and then saved as a sequence. Later, this sequence can be inserted in a new stack in the same way like every other basic layer type such as a RCWA-slice or a homogeneous layer. The period and the thickness are renormalized automatically.