

2.2 General Theory of diffraction

Matlab program

The [program](#) serves for computing and displaying the secondary (diffraction) field and the total field in the surrounding of the circular conducting cylinder, which is illuminated by a plane wave.

First, a path of matlab has to be directed to the folder **Gen_diffraction**. The program runs using the m-file [valec](#). After the introductory window disappears, the program asks for the input of data for computation. We have to give the relative cylinder radius a/λ and the distance of the observation point d/λ . Then, the computation is started (the computation takes longer time, and therefore, an indicator of the computation progress is used). When the computation is over, distribution of the primary field and the secondary one in the surrounding of the cylinder is displayed in the plane, which is perpendicular to the cylinder axis.

Then, buttons for finishing the program and for starting a new run of the program with new input data appear. In five directions, dependency of the secondary wave and the total one on the distance from the cylinder axis are shown. Field intensity $E=f(r)$ is displayed for a direction, which is opposite to the direction of the incident wave propagation, and then by steps 45° until the direction of the propagation of the incident wave is met.