Project 2. Solving the wave equation

Consider the wave equation in 2D [8, 10]:

$$\begin{cases} \dfrac{\partial^2 u}{\partial t^2} - \Delta u = f & \text{in } \Omega\,, \\ u = g & \text{on } \partial\Omega\,, \\ u(t=0) = u_0 & \text{in } \Omega\,, \\ \dfrac{\partial u}{\partial t} = u_1 & \text{in } \Omega\,. \end{cases} \tag{3}$$

Implement a finite element solver for problem (3). Discuss the choice of the time and space discretization methods, the properties of the chosen method (especially in terms of numerical dissipation and dispersion, see [8, 10]) and the computational and algorithmic aspects of the solver.

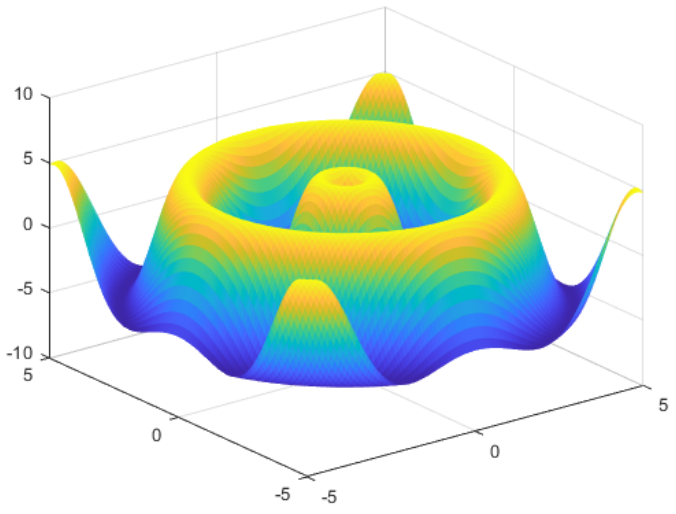

Figure 1: Example solution to the wave equation.