

# Interaction of compressible flow with an airfoil

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In this paper we deal with numerical simulation of the interaction of two-dimensional compressible viscous flow and a vibrating airfoil. The motion of the airfoil, which can rotate around the elastic axis and oscillate in the vertical direction, is described with the aid of a system of ordinary differential equations. The mathematical model of flow is represented by the system of non-stationary compressible Navier-Stokes equations. We use the ALE method for the treatment of a time dependent computational domain. The Navier-Stokes system is written in the ALE form and discretized by the discontinuous Galerkin finite element method in space and by the Euler backward formula in time. The structural ODE system is solved by the Runge-Kutta method. In order to demonstrate the applicability of the developed method, we shall present the results of the simulation of flow induced vibrations of the NACA 0012 profile.