

**Mittal, S.**

**Finite element computation of unsteady viscous compressible flows.** (English) Zbl 0953.76051  
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From the summary: We present computations of unsteady viscous transonic flows past cylinders and airfoils. Stabilized finite element methods are employed to solve the compressible Navier-Stokes equations in their conservative form. The nonlinear equations resulting from the finite element discretizations are solved using GMRES technique. To test the accuracy of the formulation, Mach 2 flow past a circular cylinder is computed with a mesh that is fine enough to resolve the shock structure for Reynolds number 50. The computational results agree quite well with analytical and theoretical results.

**MSC:**

**76M10** Finite element methods applied to problems in fluid mechanics  
**76H05** Transonic flows  
**76N15** Gas dynamics (general theory)

Cited in **14** Documents

**Keywords:**

NACA0012 airfoil; flow past airfoil in channel; angle of attack; stabilized finite element methods; compressible Navier-Stokes equations in conservative form; unsteady viscous transonic flows; GMRES technique; Mach 2 flow; circular cylinder

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