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Author: Mr. YueLong He
China Academy of Aerospace Aerodynamics (CAAA), China

Dr. Dun Li
China Academy of Aerospace Aerodynamics (CAAA), China
Mr. Liu Shuai
China Academy of Aerospace Aerodynamics (CAAA), China
Prof. Handong Ma
China Academy of Aerospace Aerodynamics (CAAA), China
Prof.Dr. Zhihui Li
China Aerodynamics Research and Development Center(CARDC), China

AN IMMERSED BOUNDARY METHOD FOR COMPRESSIBLE FLOW SIMULATION

Abstract

The immersed boundary method(IBM) was rapid developed in recent years, because of its flexibility for complex configurations and moving bodies. Most of the investigation on IB method focused on the incompressible flow because of the limitation of the interpolation method. The Choi's power-law interpolation was applied in current research for the velocity approximation at the objective cells near the immersed boundary. The ghost cell method was also used for computing the variables at the cells in the body. The subsonic/transonic NACA0012 airfoil compressible cases and 2D supersonic cylinder benchmark cases were chosen for method validation. The numerical result of these benchmark cases with proper value of parameter k compared well with the experimental data. The mesh convergence of the new method has also been proved. The analysis and discussion show that the method is suitable for compressible flow simulation.