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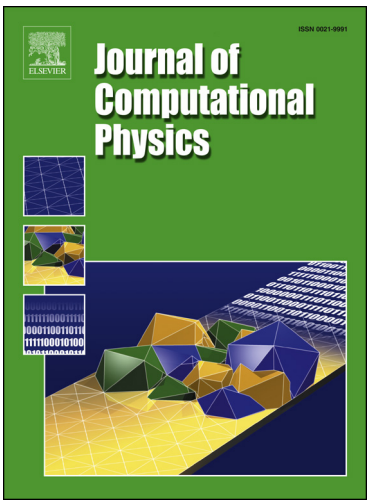

Effects of High-Frequency Damping on Iterative Convergence of Implicit Viscous Solver

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Highlights

- An implicit diffusion solver is analyzed to predict convergence rates for a range of a damping coefficient.
- The damping coefficient should be $4/3$ or stay close to 1 for better accuracy and iterative convergence.
- Implicit Navier–Stokes solver can diverge for a small damping coefficient even when dominated by convection.
- A variable-preconditioner Newton–Krylov solver is demonstrated as a robust alternative, which converges even when the implicit solver diverges.

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