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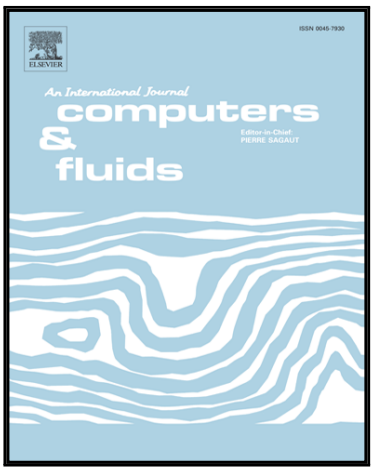

Particle simulation of nonequilibrium gas flows based on ellipsoidal statistical Fokker-Planck model

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Highlight:

- A two-dimensional implementation of the ellipsoidal statistical Fokker-Planck (ES-FP) model is presented.
- Analytical solution for the initial-value problem of the spatial homogeneous ES-FP equation is obtained.
- Supersonic flat-plate flows at different Knudsen numbers ranging from 0.001 to 0.1 are simulated with the ES-FP solver.
- The ES-FP simulation shows better numerical efficiency than DSMC at low Knudsen numbers.
- Numerical simulations verify the correct Prandtl number underlying the ES-FP model.

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