

**Distributed Simulation of Transitional Nanoscale Channel Flows by a DSMC Method with an Enhanced Reliability.****Vladimir P. Memnonov***St.Petersburg State UNiversity, St.Petersburg, Russia*

Vladimir P. Memnonov St.Petersburg State University, Math. and Mech. Dept., St.Petersburg, Russia Transitional flows in very narrow channels were studied in the paper with the help of distributed simulation by DSMC method on several parallel clusters for reduction of statistical scattering in order to resolve low flow velocities. By employment additionally a coupled at the boundaries finite element solution of the Navier–Stokes equations for the outer flow important features of a complex channel flow, which models the flow in Winchester-type disc storage devices, were established. The two new developed fault tolerant algorithmic procedures for diminishing bad consequences of possible node and link failures in this complicated computational systems essentially increased reliability of such distributed simulations and were applied to a filter problem which was simulated with the help of a metacomputing scheme.

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