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Michael Renardy* (mrenardy@math.vt.edu), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061-0123, and **Shirshendu Chowdhury, Debanjana Mitra** and **Mythily Ramaswamy**. *Null controllability of the linearized compressible Navier-Stokes system in one dimension.*

We consider the one dimensional compressible Navier-Stokes equations linearized around a steady state of constant density and constant nonzero velocity, with periodic boundary conditions. We explore the controllability of this linearized system using a control only for the velocity equation. We prove that the linearized system with homogeneous periodic boundary conditions is null controllable in an appropriate Sobolev space by a localized interior control when time is sufficiently large. The proof is based on an observability inequality obtained with the help of two types of Ingham inequality.

We also consider the analogous problem with Dirichlet boundary conditions rather than periodicity. For this case, we show approximate controllability and null controllability in the case of creeping flow. (Received January 15, 2014)