DISCONTINUOUS SOLUTIONS FOR THE EVOLUTION COMPRESSIBLE STOKES SYSTEM

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ABSTRACT

An evolution compressible Stokes system is studied in a bounded cylindrical region $Q = \Omega \times (0, T)$. The initial datum of pressure is assumed to have a jump at a specified curve $\mathcal{C}_0$ in Ω. As predicted by the Rankine-Hugoniot conditions, the pressure and velocity derivatives have jump discontinuities along the characteristic plane of the curve $\mathcal{C}_0$ directed by an ambient velocity vector. An explicit formula for the jump discontinuity is presented. The jump decays exponentially in time, more rapidly for smaller viscosities. Under suitable conditions of the data, a regularity of the solution is established in a compact subregion of Q away from the jump plane.

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