SMOOTH IMPLODING SOLUTIONS FOR 3D COMPRESSIBLE FLUIDS

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Building upon the pioneering work of Merle-Rodnianski-Szeftel, we construct exact, smooth self-similar imploding solutions to the 3D isentropic compressible Euler equations for ideal gases for all adiabatic exponents. For the particular exponent 7/5, corresponding to diatomic gasses, akin to the result of Merle-Raphael-Rodnianski-Szeftel, we show the existence of a sequence of smooth, self-similar imploding solutions. In addition, we provide simplified proofs of linear stability and non-linear stability which allows us to construct asymptotically self-similar imploding solutions to the compressible Navier-Stokes equations with density independent viscosity for the adiabatic exponent 7/5 and density bounded from below.