

Review of: "Hamiltonian, Lagrangian, Dynamics and Singularity of the Compressible Fluid Flow"

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Potential competing interests: No potential competing interests to declare.

Before accepting those interesting conclusions presented in the Summary, there are several basic assumptions or statements made in the manuscript that need attention because they are vital to reaching the reported findings:

1. An initial system of *an infinitely dilute system* was used, meaning zero density or no mass present. Then, *after an adiabatic compression, the mass density of the box is $\rho_o = m_o/V_o$* . It is a fair question to ask: where m_o is coming from? It should be noted that this density plays a vital role in later development.
2. As pressure, p , is a function of volume, V (see Eq. (3)), integrating Eq. (2) does not give Eq. (3).
3. There is a problem with the statement (or assumption?) that there is *no macroscopic motion* in a CoM frame. At the center of a CoM frame, only the total momentum of all particles present is zero; it does not imply that the macroscopic motion is zero in any given system using this frame.

All these variables are important in the derivations of various relationships later in the manuscript.

As a general comment, it is problematic to treat liquid and gas as equal in a fluid, as both have marked differences in their inherent physical properties. The metafluid is an exception.