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Comment on "Roles of Bulk Viscosity on Rayleigh-Taylor Instability: Non-Equilibrium Thermodynamics Due to Spatio-Temporal Pressure Fronts" Phys. Fluids 28, 094102 (2016)

Robert L. Ash
Old Dominion University, rash@odu.edu

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Comment on "Roles of bulk viscosity on Rayleigh-Taylor instability: Non-equilibrium thermodynamics due to spatio-temporal pressure fronts" [Phys. Fluids 28, 094102 (2016)]

Robert L. Ash
Mechanical and Aerospace Engineering, Old Dominion University, Norfolk, Virginia 23529, USA

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The authors of this timely article have incorrectly credited R. L. Ash, A. J. Zuckerwar, and Z. Zheng, "Second coefficient of viscosity in air," AIAA J. **28**, 171–173 (1990) as their source for an important empirical representation of the influence of temperature and relative humidity on the bulk viscosity of air employed in that article. There was no such publication. However, we did report the data that were employed in Figure 7 of that article,[5] as part of a NASA contractor report,[1] and that may explain the error. This author believes that Sengupta *et al.* have identified an important non-equilibrium effect, but they should have been more thorough in reviewing the underlying non-equilibrium physics literature. Marcy[2] was their other primary source for bulk viscosity data, and that article also employed the experimental work of the late Allan Zuckerwar extensively, but made it very difficult to properly attribute specific correlation models to original sources, contributing to possible confusion.

The citation error should be corrected and attention should be called to our more-recent bulk viscosity research published in *Physics of Fluids*.[3,4] We believe the more recent work represents a rigorous approach for segregating bulk viscous effects from non-equilibrium thermodynamic effects in unsteady fluid flow processes. The empirical relations which Singupta *et al.* have attributed to Ash *et al.* are not altered directly by this newer theory, but the possibility of non-equilibrium pressure influences on otherwise incompressible rotational flows should be considered as well.

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[5] T. K. Sengupta, A. Sengupta, N. Sharma, S. Sengupta, A. Bhole, and K. S. Shurti, "Roles of bulk viscosity on Rayleigh-Taylor instability: Non-equilibrium thermodynamics due to spatio-temporal pressure fronts," Phys. Fluids **28**, 094102 (2016).