A remark on the objectivity of stress tensor in mass diffusive compressible fluid model

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Abstract

The mass diffusive model of Svärd [1] and its symmetrized version introduced by Bodnár and Fraunié [2], recently studied in Bodnár and Mácha in [3] is discussed here from the point of view of objectivity of the constitutive part of the stress tensor. The class of Euclidian frame transformations is considered, taking into account the time dependent rotation and translation of the reference frame . The corresponding transformation properties of stress tensor are first derived for the classical Navier-Stokes-Fourier model, and then compared with those of the original (non-symmetric) mass diffusive model and its symmetrized version. It is shown that the mass diffusive models (their stress tensors) are not objective in general and only in specific scenarios may be close to objectivity.

References

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