Abstract Submitted
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Diffusive Mixing in Strongly Coupled Plasmas[1] ABDOURAH-
MANE DIAW, MICHAEL MURILLO, New Mexico Consortium — A multispecies
hydrodynamic model based on moments of the Born-Bogolyubov-Green-Kirkwood-
Yvon (BBGKY) hierarchy [1] is developed for physical conditions relevant to astro-
physical plasmas. The modified transport equations incorporate strong correlations
through a density functional theory closure, while fluctuations enters through a mix-
ture BGK operator. This model extends the usual Burgers equations for a dilute
gas to strongly coupled and isothermal plasmas mixtures. The diffusive currents
for these strongly coupled plasmas is self-consistently derived. The settling of im-
purities and its impact on cooling of white dwarfs and neutron stars [2] can be
greatly affected by strong Coulomb coupling, which we show can be quantified using
the direct-correlation function. [1] A. Diaw and M. S. Murillo, Phys. Rev. E, 92,
013107 (2015) [2] A. Diaw and M. S. Murillo (to appear in Astrophysical Journal,
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