

Abstract Submitted
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Ion Transport in Collisional Unmagnetized Plasma With Multiple Ion Species¹ ANDREI N. SIMAKOV, KIM MOLVIG, Los Alamos National Laboratory — A fluid description of collisional unmagnetized plasma with multiple ion species is of interest for inertial confinement fusion (ICF). Different ions of the ICF capsule plasma can respond differently to the electric field and various gradient drives, resulting in important effects on the capsule implosion and performance not described by single-fluid equations. While multiple ion species plasma fluid descriptions exist, for example in [1], they are incomplete and lacking the calculations of the full array of transport coefficients. Herein, we attack the problem by appropriately generalizing the classical work of Braginskii [2] (a la Chapman-Enskog [3]) to a multi-component plasma. Having derived general equations for plasma transport coefficients, we then consider specific cases of deuterium-tritium plasma without and with presence of a gold component.

[1] V. M. Zhdanov, *Transport Processes in Multicomponent Plasma* (Taylor & Francis, New York, 2002).

[2] S. I. Braginskii, in *Reviews of Plasma Physics*, edited by M. A. Leontovich (Consultants Bureau, New York, 1965), Vol. 1, p. 205.

[3] S. Chapman and T. G. Cowling, *The Mathematical Theory of Non-uniform Gases* (Cambridge University Press, Cambridge, 1995).

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