

Abstract Submitted
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A drift ordered short mean-free path description for partially ionized magnetized plasma¹ ANDREI SIMAKOV, Los Alamos National Laboratory — Effects of neutral particles are very important at the edge of a tokamak and so must be self-consistently accounted for. This has only been done so far for short mean-free path plasma under the high-flow Braginskii ordering [1]. Since plasma flow in modern tokamaks is often comparable with the diamagnetic heat flow divided by pressure it is appropriate to use drift ordering instead. Here we consider short mean-free path plasma consisting of electrons, singly-charged ions, and neutrals. We neglect neutral-neutral and elastic electron-neutral collisions and approximate the neutral-ion charge-exchange cross-section with a constant. We employ drift ordering to evaluate ion, neutral, and electron heat fluxes, viscosity tensors, and momentum and energy exchange terms and formulate a self-consistent system of electron, ion, and neutral fluid equations, thereby generalizing the drift-ordered treatment [2] of fully ionized plasma.

[1] P. Helander, S. I. Krasheninnikov, and P. J. Catto, *Phys. Plasmas* **1**, 3174 (1994) and references therein.

[2] P. J. Catto and A. N. Simakov, *Phys. Plasmas* **11**, 90 (2004).

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