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**Quantum Kinetic Model for Dense Plasma Mixtures**[1] JEFF HAACK, Los Alamos National Laboratory, CORY HAUCK, Oak Ridge National Laboratory, MICHAEL MURILLO, Michigan State University — A multitemperature Bhatnagar-Gross-Krook kinetic model is developed that includes partial degeneracy for the electrons. The model is constructed to satisfy the basic conservation laws with an H-theorem, generalized to mixed statistics (i.e., Maxwell-Boltzmann, Fermi-Dirac), that yields the desired equilibrium limit. From this model, we obtain a moment-based quantum hydrodynamics formulation closed through a Chapman-Enskog expansion to yield expressions for the transport coefficients, including electron-ion temperature relaxation and electronic thermal conductivity. The transport coefficients include both electron-electron and electron-ion collisions with degeneracy corrections valid from zero temperature to the classical limit. Comparisons are made with previous kinetic models for dense plasmas, and implications for modeling experiments are discussed.

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