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Transport coefficients for electrons in Hg vapor SASA DUJKO, Institute of Physics, University of Belgrade, PO Box 68, Zemun 11080, Belgrade, Serbia, RON WHITE, ARC Centre for Antimatter-Matter Studies, School of Engineering and Physical Sciences, James Cook University, Townsville 4810, Australai, ZORAN PETROVIC, Institute of Physics, University of Belgrade, PO Box 68, Zemun 11080, Belgrade, Serbia — Transport coefficients and distribution functions are calculated for electrons in Hg vapor under swarm conditions using a multi term theory for solving the Boltzmann equation, over a range of E/N values and temperatures relevant to lamp discharges. It is shown that for higher E/N the electron distribution is non-thermal for all Hg vapor temperatures considered, and that the speed distribution function significantly deviates from a Maxwellian under these conditions. Our work has been motivated, in part, by recent suggestions that highly accurate data for transport coefficients required as input in fluid models of Hg vapor lamp discharges may significantly improve the existing models. Current models of such lamps require a knowledge of the plasma electrical conductivity, which can be calculated from the cross sections for electron scattering in Hg vapor and mobility coefficients presented in this work. The effect of metastable atoms on the swarm parameters is also discussed. The influence of a magnetic field on electron transport coefficients in Hg vapor is investigated over a range of B/N values and angles between the fields.

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