Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Effects of anisotropic scattering and energy sharing after ionization on electron transport in argon SASA DUJKO, DANKO BOSNJAKOVIC, Institute of Physics University of Belgrade, Serbia, ZORAN PETROVIC, Serbian Academy of Sciences and Arts, Serbia, TOSHIAKI MAKABE, Keio University Japan — Electron transport coefficients and other transport properties are firstly calculated for the isotropic scattering model in inelastic collisions using the set of cross sections developed at Keio University. Other sets of cross sections for electron scattering in argon were also used as an input into our Boltzmann equation and Monte Carlo codes with an aim of testing their completeness, consistency and accuracy. The calculated swarm parameters are compared with measurements in order to assess the quality of the cross sections in providing data for plasma modeling. The effects of anisotropic scattering are investigated based on the screened Coulomb potential between electrons and neutral atoms of argon. In addition, we consider many empirical formulas for angular scattering of elastic and inelastic collisions that represent in certain ways the forward scattering with increasing electron energy. Likewise, we investigate the impact of energy sharing models for ionization, as this effect is comparable to the impact of anisotropic scattering for the high-energy electrons. Calculations have been performed for both DC and RF electric fields. In RF fields, temporal profiles of electron transport coefficients as well as the cycle-averaged values of transport coefficients are calculated over the range of the field amplitudes and field frequencies. In addition, effects of anisotropic scattering and energy sharing between the scattered and injected electrons on electron velocity distribution function are studied.

Sasa Dujko
Institute of Physics University of Belgrade, Serbia

Date submitted: 11 Jun 2020 Electronic form version 1.4