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Boltzmann equation analysis and Monte Carlo simulation of electron transport in N_2-O_2 streamer discharge SASA DUJKO, UTE EBERT, Centre for Mathematics and Computer Science (CWI), P.O.Box 94079, 1090 GB Amsterdam, The Netherlands, RONALD WHITE, ARC Centre for Antimatter-Matter Studies, School of Electrical Engineering and Physical Sciences, James Cook University, 4810 Townsville, Australia, ZORAN PETROVIC, Institute of Physics, University of Belgrade, P.O.Box 68, 11080 Zemun, Belgrade, Serbia — A comprehensive investigation of electron transport in N_2-O_2 mixtures has been carried out using a multi term theory for solving the Boltzmann equation and Monte Carlo simulation technique instead of conventional two-term theory often employed in plasma modeling community. We focus on the way in which the transport coefficients and spatially resolved transport data are influenced by the amount of O_2 in the mixture. Emphasis is placed upon the explicit and implicit effects of non-conservative collisions, ionization and attachment on various transport coefficients. In particular, the effects of three-body attachment for electrons on various transport data are considered. It is found that the difference between two sets of transport coefficients, bulk and flux, resulting from the explicit influence of non-conservative collisions depends on the variation of the amount of O_2 in mixture. The critical values of E/N for which the ionization exactly balances the electron attachment are determined.

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