A new electron transport Monte Carlo code

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We present a code for the Monte Carlo simulation of electron transport in an arbitrarily complex gas mixture. The code is designed so as to enable a relatively easy integration of an electron and heavy-particle Monte Carlo formulation [1]. Following the strategy of the LisbOn Kinetics Boltzmann solver (LoKI-B) [2], the simulation tool can address electron-neutral collisions with any target state (electronic, vibrational and rotational), characterized by any user-prescribed population, allowing to include the effects of superelastic collisions in a general manner. The influence of the thermal motion of the background molecules is considered, allowing to describe the swarm behavior at low reduced electric fields E/N. On output, the program provides: the electron energy distribution function and the electron velocity distribution function; flux and bulk swarm parameters; collision rates; power balance; and the spatiotemporal evolution of the electron swarm. The code will be released in the near future as part of the simulation tools provided by the N-PRiME group at Lisbon.

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