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Comparisons of electron transport and rate coefficients in CO₂ and Ar/CO₂ calculated from cross-section datasets available on LXCat
L.C. PITCHFORD, Laplace, CNRS Univ. Toulouse III, France, L.L. ALVES, V. GUERRA, IPFN/IST-UTL, Portugal, S.F. BIAGI, CERN, RD51 Collaboration, I.V. KOCHETOV, A.P. NAPARTOVICH, SRC Trinita, Russia, W.L. MORGAN, Kinema Research, Colorado, J. STEPHENS, Texas Tech Univ, Lubbock, TX — LXCat (www.lxcat.net) is an open-access, web-based platform for archiving and manipulating collections of data related to electron and ion scattering and transport in low-temperature plasmas (LTP's). LXCat is organized into individual databases containing data uploaded by individual contributors from the LTP community. This implies that data for any particular process can exist in multiple databases on LXCat, and if they differ, users of LXCat are confronted with the choice of which data to use. In this communication, we examine the "complete" sets of cross-sections for electron scattering in CO₂ that are available in 6 different databases on LXCat, where "complete" implies that the major electron momentum and energy loss processes are well described in the dataset. When these sets of cross-sections are used as input to an electron Boltzmann equation solver, electron energy distribution functions and hence electron transport and rate coefficients can be calculated as functions of E/N, the ratio of the electric field to the neutral gas number density. These cross-section sets differ somewhat among themselves, yet each yields reasonable agreement with the measured transport and rate data that were available at the time each dataset was compiled, some dating back to the late 1970's.

L.C. Pitchford
Laplace, CNRS
Univ Toulouse III, France

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