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LXCat: A web-based, community-wide project on data for modeling low temperature plasmas

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LXCat is an open-access website (www.lxcats.net) for exchanging data related to ion and electron transport and scattering cross sections in cold, neutral gases. At present 30 people from 12 countries have contributed to the LXCat project. This presentation will focus on the status of the data available for electrons on LXCat. These data are primarily in the form of “complete” sets of cross sections, compiled or calculated by different contributors, covering a range of energies from thermal up to about 1 keV. The cross section data can be used directly in Monte Carlo simulations and can also be used as input to Boltzmann equation solvers. Solution of the homogeneous, steady-state Boltzmann equation yields electron energy distribution functions (edf) as a function of reduced electric field strength, E/N , integrals over which yield electron transport and rate coefficients. The transport and rate coefficient data are required input for fluid models of low temperature plasmas. Evaluation of the cross section data sets available on LXCat is a key issue. To this end, the LXCat team has been making systematic intercomparisons of cross section data and comparisons of calculated and measured transport and rate coefficients. Our evaluations have been reported previously for noble gases and for common atmospheric gases. The LXCat team is now evaluating data for more complex molecules.