

## Status report on the LXCat project

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The LXCat project is an open-access website for exchanging data related to electron transport and electron scattering cross section compilations for use in Boltzmann or Monte Carlo codes. In this contribution, we will present an update on the status of the LXCat project, whose focus in 2011 was on the critical compilation of electron cross sections and swarm parameters for the rare gases and in 2012 is on the compilation and evaluation of data for common atmospheric gases.

The *GEC Plasma Data Exchange Project* is an informal, community-based project which was initiated as a result of a public discussion held at the 2010 Gaseous Electronics Conference (*GEC*). This project aims to address, at least in part, the well-recognized needs for the community to organize the means of collecting, evaluating and sharing data both for modeling and for interpretation of experiments. A workshop of the *Plasma Data Exchange Project (PDEP)* was held at the *GEC* in November 2011, and the *GEC* will hold additional workshops in 2012/13.

At the heart of the *PDEP* are the open-access websites, *LXCat* and *ICECat*, developed by researchers in Toulouse. *LXCat* ([www.LXCat.laplace.univ-tlse.fr](http://www.LXCat.laplace.univ-tlse.fr)) distributes collections of data related to electron scattering and transport in cold, neutral gases, critically important to modeling low temperature plasmas [1]. At present, 14 databases, contributed by groups around the world can be accessed on *LXCat*, with several others under development. On-line tools enable importing and exporting data, plotting and comparing different sets of data, and for downloading data. In cases where complete sets of cross sections are available, the conversion to electron transport and rate coefficients can be accomplished with online or downloadable tools, including the Boltzmann equation solver, BOLSIG+. Databases of experimental swarm parameters are also available on *LXCat* and comparisons of calculated and measured swarm parameters can be done on-line. The second website, *ICECat* ([www.icecat.laplace.univ-tlse.fr](http://www.icecat.laplace.univ-tlse.fr)) is devoted to ion-neutral cross sections, interaction potentials and ion transport parameters in neutral gases. The data on this site have been contributed mainly by Prof. Larry Viehland, co-author of the classic series of review papers on ion transport coefficients.

In this contribution, we will present an update on the status of the LXCat project. In anticipation of the 2011 *GEC PDEP* workshop, researchers from seven different laboratories in 4 countries (France, Portugal, UK and USA) worked together to evaluate available cross section compilations for the rare gases and compared calculated swarm parameters with available experiment. The focus for the 2012 *GEC* workshop will be on electron scattering cross sections and swarm parameters in common atmospheric gases. Work is in progress now on compiling and evaluating data for these gases. Anyone willing to contribute to this project is welcome to take part.

### References

[1] S. Pancheshnyi, S. Biagi, M.C. Bordage, G.J.M. Hagelaar, W.L. Morgan, A.V. Phelps, and L.C. Pitchford, "The LXCat project: Electron scattering cross sections and swarm parameters for low temperature plasma modeling", *Chemical Physics* (2011) doi:10.1016/j.chemphys.2011.04.020