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Electron scattering data as the basis for kinetic models – what can we realistically provide, and how?[1]

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It is unlikely that anyone would dispute the important role that the availability of accurate data can play in the modeling and simulation of low temperature plasmas. Fundamental measurements of collision processes, from the relatively simple (eg. elastic scattering) to the complex (eg. molecular dissociation) are critical to developing an understanding of discharge and plasma behaviour. While there has been a healthy relationship between the data users and data gatherers at meetings such as GEC for many years, there are often misunderstandings about the capabilities that reside in each of these areas, and how best to maintain and strengthen the communication between them. This paper will attempt to summarise those electron-driven processes that are accessible, in a quantitative sense, in modern scattering experiments. Advances in treating reactive and excited species will also be discussed, as will the potential to push our measurement technologies further. An inescapable conclusion is that the collision community can best contribute through a strategic alliance between experiment and theory. Theory should be benchmarked against experiment for those processes and targets that are accessible, and used wisely for those processes where experiment cannot contribute.

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