

Session 3

Comprehensive data on atom+hydrogen and atom+electron collisions for spectroscopic and spectropolarimetric applications

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Without comprehensive knowledge of atomic collision data, efficient exploitation of polarimetric and spectroscopic observations becomes complicated. To contribute in overcoming this complication, we provide accurate variation laws leading to comprehensive determination of all depolarization and polarization transfer rates due to elastic collisions of hydrogen atoms with solar simple atoms, complex atoms, and atoms with hyperfine structure (e.g. Derouich 2020, *The Astrophysical Journal Supplement Series*, Volume 247, Issue 2, id.72). Then, we present general approach for calculating rates of excitation and polarization transfer due to collisions with electrons. Accuracy of our results is discussed. In addition, we extract new useful insights from the existing literature and suggest concrete ways of understanding, and correctly using, the available collisional data. Interesting open questions and misunderstandings will be pointed out and illustrated, especially regarding the case where magnetic fields effects are relevant during the collisions.