

Theoretical studies of ionization and single and double electron capture in ion-atom collisions with many active electrons at low and intermediate energies

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At the first RMC meeting we introduced the switching CTMC approach, especially designed to classically treat more than one active electron systems [1], with the aim to describe atomic processes involving neutral beams with more than one active electron.

In this talk I will report our recent studies on ionization and electron capture processes in proton+Ar collisions from 100 eV to 200 keV collision energies [2]. We have applied two methods, the switching CTMC and a semiclassical treatment with a molecular expansion [3] in a basis of electronic wave functions of the ArH⁺ quasimolecule and we have tried to accurately represent two-electron processes, in particular, the double electron capture which cross sections are very small. I will show the general good agreement of the calculated cross sections and I will also discuss the limitations of both type of calculations.

[1] A Jorge *et al.*, Phys. Rev. A **94** 022710 (2016)

[2] A Jorge *et al.*, J. Phys. Chem. A **122** 2523 (2018)

[3] P Barragán *et al.*, Phys. Rev. A **82** 030701 (2010)