

ELECTRONIC PROCESSES CROSS SECTIONS EVALUATION
WITH A SEMICLASSICAL NON PERTURBATIVE APPROACH

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In the talk, I will summarize the recent theoretical developments our group has made in the context of the Coordinated Research Project on Data for Atomic Processes of Neutral Beams in Fusion Plasma:

* We have developed, implemented and employed a semiclassical non-perturbative approach for one and two-electron collision systems [1-4].

* We have calculated electron capture, excitation and ionization cross sections for collisions of fully stripped hydrogen, helium and lithium ions with atomic hydrogen in the ground state and in all excited states up to $n=3$ [5]. Collision energies between 1 and 100 keV/u were considered. Furthermore, we provide estimates of the accuracy of the cross sections. The set of data presented in this work represent the first complete and consistent quantum study of these collision systems, which can be used in the modeling and diagnosis of thermonuclear fusion plasma reactors.

* In the context of the code comparison we have calculated the cross sections for collisions of fully stripped beryllium ions with atomic hydrogen in the $n=2$ excited states.

References

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