Soutenance de thèse

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"Experimental study of electron impact double ionization dynamics for atomic and molecular targets at intermediate incident energies"

The main objective of this thesis is to investigate the contributions of different dynamical mechanisms in the electron impact double ionization (DI) of atomic and molecular targets at intermediate incident energies.

The five-fold differential cross sections and four-fold differential cross sections for ejected electrons, which correspond to the so-called (e, 3e) and (e, 3-1e) experiments, were measured for different targets under various kinematics. These experimental results are compared with different theoretical calculations, including first order mechanisms (such as Shake Off (SO) and Two Step 1 (TS1)) and/or second order mechanisms (such as Two Step 2 (TS2)). The analysis shows that the second order mechanism plays an important role in the projectile-target DI interaction process under present kinematics.

Moreover, all of these DI measurements are compared with the TS2 kinematical analysis model developed by Lahmam-Bennani *et al*, in which only binary contributions are considered in each of the constituting (e, 2e)-like step. Besides, we show that by including not only the binary contributions but also the recoil contributions the TS2 predictions are in good agreement with the structures observed in the measured (e, 3-1e) and (e, 3e) angular distributions, hence constituting an improvement over the previous TS2 kinematical analysis 'excluding' recoil contribution. However, it remains highly desirable to develop more elaborate first order and/or second order calculations to be compared with our experimental data.

ATTENTION JOUR ET HEURE INHABITUELS

Jeudi 25 avril 2013 à 10h
Bât 351 – 2ème étage (Bibliothèque)
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La soutenance sera suivie d'un pot auquel vous êtes chaleureusement conviés.