

**New of Schwinger Variational Principle for K-Shell Excitation of
CA¹⁸⁺ (1S²) Ions by Impact of Various Atoms at 8.6 MeV/amu**

Lasri, B.; Hanssen, J.

Abstract :

A new variational impact parameter approach to the process of direct electronic excitation of atoms by impact of ions at intermediate velocities regimes was shown to be very successful in predicting the saturation of cross sections when the projectile charge is increased [1–4]. In our approach, this new procedure is based on the fractional form of the Schwinger variational principle and applied to study *K*-shell excitation of Ca¹⁸⁺(1s²)ions impinging at 8.6 MeV/amu on various gases (H₂, He, N₂, O₂, Ne, Ar, Kr, Xe). The excitation cross sections are compared with another theoretical approaches, like Born approximation. All obtained results stay in good agreement with experimental data of Xiang-Yuan Xu *et al.* [5].

Keywords : matrix algebra, nuclear charge, charge exchange, excited states; Matrix theory, Charge distribution, Charge transfer, Potential energy surfaces for excited electronic states.

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