

# EXCITATION OF HELIUMLIKE $\text{Ar}^{16+}(1s^2)$ IONS BY NEUTRALS AT INTERMEDIATE IMPACT ENERGIES: PROJECTILE NUCLEAR CHARGE DEPENDANCE

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**ABSTRACT.** Schwinger variational approach to the process of direct electronic excitation of atoms by impact of ions at intermediate impact energies was shown to be very successful in predicting the saturation of excitation cross sections when the projectile charge is increased. In this study, our new approach is based on the fractional form of the Schwinger variational principle and applied to study the excitation of  $\text{Ar}^{16+}(1s^2)$  ions impinging at 13.6 MeV/u (23 a.u) by various atoms of nuclear charges  $Z_p$  ( $2 \leq Z_T \leq 54$ ) which include neutral gaseous (He,  $\text{N}_2$ , Ne, Ar, Kr, Xe). Our theoretical calculations of the excitation cross sections stay in good agreement with experimental data of Adoui *et al.*