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Kinematically Complete Experiment on Double Ionization Accompanied by Capture in Slow He^{2+} + Ar Collisions[1] MICHAEL SCHULZ, Missouri Univ of Sci Tech, YONG GAO, DL GUO, SHAOFENG ZHANG, XL ZHU, RT ZHANG, WT FENG, DM ZHAO, XINWEN MA, Insitute of Modern Physics Lanzhou — We have performed a kinematically complete experiment on double target ionization accompanied by capture in 120 keV He^{2+} + Ar collisions. The momentum-analyzed ejected electrons and recoiling target ions were measured in coincidence and the scattered projectile momentum was deduced from momentum conservation. The data were analyzed by several analysis techniques. Fully differential cross sections (FDCS) were extracted to sensitively test theoretical models. 4-particle Dalitz (4-D) plots were analyzed as a tool to combine comprehensiveness with detail. 4-D plots are comprehensive because the integral of the spectrum represents the total cross section. They nevertheless offer a lot of detail as the momentum exchange between all four final-state particles is simultaneously presented in these plots. Finally, the correlation function was generated to identify electron-electron correlations even under conditions, as in this collision system, where such correlations are expected to be very weak. Overall, the data can to a large extent be understood within an independent electron model. However, surprising correlations between the ejected electrons and the scattered projectiles were found.

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