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Correlated electron effects in low energy alkaline earth ion scattering XIAOXIAO HE, JORY YARMOFF, Department of Physics & Astronomy, University of California, Riverside — The spin correlations of many electrons can lead to emergent phenomena that cannot be extrapolated from the behavior of independent electrons. The role of such multi-electron processes in charge exchange during atom-surface collisions remains a challenging and unsolved problem. Two prior independent theoretical investigations predicted that when a projectile has a single unpaired electron or hole, this localized spin impurity would induce a Kondo resonance at the Fermi energy leading to a mixed-valent state in the metal conduction band. The occupancy of this sharp state would be a strong function of the surface temperature, which would cause an anomalous temperature dependence of the neutralization probability in a scattering experiment. We demonstrate such dependence for low energy Sr^+ scattered from clean polycrystalline gold. This unusual temperature dependence is amplified when the metal work function is reduced by embedding Sr atoms into the material.

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