Abstract Submitted
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Quantum-defect theory of resonant charge exchange[1] MING LI, BO GAO, University of Toledo — We apply the quantum-defect theory for $-1/r^4$ potential[2] to study the resonant charge exchange process. We show that by taking advantage of the angular-momentum- insensitive nature of formulation, resonant charge exchange of the type of ${}^1S+{}^2S$ can be accurately described over a wide range of energies using only three parameters, such as the gerade and the ungerade scattering lengths, and the atomic polarizability. The parameters can be determined experimentally, without having to rely on accurate potential energy surfaces (PES), of which few exist for ion-atom systems. The theory further relates ultracold interaction to interactions at much higher temperatures.

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[2]B. Gao, Phys. Rev. Lett. **104**, 213201 (2010).

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