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Charge transfer in slow collisions between hydrogen atoms and metal surfaces B. BAHRIM, Dept. of Physics, Kansas State University, Manhattan and Chemistry and Physics Dept., Lamar University, Beaumont, TX, U. THUMM, Dept. of Physics, Kansas State University, Manhattan — We have developed a new two-center close-coupling approach [1] for slow ion (atom)-surface collision in which the continuum of metal conduction-band states is discretized by using Weyl wave packets [2] to represent the motion of the active electron in the metal subspace. Results for the time evolution of the atomic and metallic population amplitudes for a hydrogen atom in colliding at perpendicular incidence with an model aluminum surface are shown and discussed. For the n=2 hydrogenic manifold, we have obtained converged atomic populations amplitudes by including all projectile levels up to the n=5 manifold and 480 Weyl wave packets in the close-coupling expansion. We will discuss the electron dynamics in particular in view of possible dephasing effects (in distance and time) and recurrence effects that may arrise due to our continuum discretization in term of a finite number of localized Weyl packets.

[1] B. Bahrim and U. Thumm, Surf. Sci. 451, 1 (2000), and to appear in Phys. Rev. A.

[2] B.H. Bransden and M.R.C. McDowell, "Charge Exchange and the Theory of Ion-Atom Collisions" Clarendon Press (Oxford 1992).

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