Adsorbates effects in $\text{H}^-$ - $\text{Na/Cu}(111)$ collisions\(^1\) BOGDANA BAHIRM, SONG YU, Department of Chemistry and Physics, Lamar University - Texas — The (111) faces of Cu, Ag and Au present a band gap that extends just below the vacuum level at the $\Gamma$ gpoint [1]. The effect is to forbid electrons with energies in a certain range to be transferred into the metal along the surface normal. Thus, the presence of a band gap should dramatically influence various experiments in ion-surface collisions involving electron capture or loss. In recent years, this topic received a great interest [2 – 4]. Adsorbates deposition makes the electron dynamics at such surfaces to be even more complex. We analyze some interesting adsorbates effects: (1) projectile energy levels and widths are strongly perturbed when this approaches close to an adsorbate atom; (2) scattering by adsorbates may be used to laterally confine surface state electrons; (3) adsorbates may enhance the band gap effect; (4) adsorbates tend to couple the surface states to the bulk states. Results for the $\text{H}^-$ projectile interacting with a Na/Cu(111) surface are reported. [1] E.V. Chulkov, V.M. Silkin and P.M. Echenique 1999 Surf. Sci. 437, 330. [2] A.G. Borisov, A.K. Kazansky and J.P. Gauyacq 1999 Phys. Rev. B. 59, 10935. [3] H.S. Chakraborty, T. Niederhausen and U. Thumm 2004 Phys. Rev. A. 70, 052903. [4] B. Bahrim, B. Makarenko and J.W. Rabalais 2005 Surface Sci. 594, 62.

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