

Abstract Submitted
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Hyperthermal Energy Ion Scattering as a Time Resolved Probe of Pico- to Femtosecond Surface Excitations¹ R.E. LAKE, M.P. RAY, C.E. SOSOLIK, Clemson University — Trajectories of hyperthermal energy alkali ions scattered from single crystal metal surfaces are well described by binary classical collisions with a strong dependence on the atom-surface mass ratio. Such simple events allow hyperthermal ion scattering to be used as a time resolved probe for studying novel surface effects such as femtosecond scale electron transport and ballistic electron excitations. In this talk, three ion scattering cases from the 1-1000 eV energy regime are discussed. K^+ scattered from Ag(100) is compared to Na^+ scattered from Cu(100) in terms of interaction potential, image charge effects and neutralization probability. Secondly the heavy atom Cs^+ -Ag(100) system will be presented including a discussion of an anomalous high energy peak possibly attributable to a collective surface response. Finally a method for probing hot electron excitation by an alkali beam scattered from a biased atomically ordered ultrathin film device will be discussed including charge transfer predictions based on rate equations and quantum mechanical $1/N$ and dynamic matrix renormalization group codes.

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