

Abstract Submitted  
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**Ionization of Xe(nf) Rydberg Atoms at Surfaces: Effect of Stray Fields**<sup>1</sup> DENNIS NEUFELD, HARDIN DUNHAM, Rice University, STEPHAN WETHEKAM, Institut für Physik der Humboldt-Universität zu Berlin, JAMES LANCASTER, F.B. DUNNING, Rice University — The ionization of xenon Rydberg atoms excited to the lowest-lying state in the  $n = 20$  Stark manifold at Si(100) surfaces possessing a robust ( $\sim 10\text{\AA}$ ) native oxide layer and at Au(111) surfaces is investigated as a function of the angle of incidence. Analysis of the data in both cases points to the presence of localized stray fields at the surface associated with surface inhomogeneities which modify the atom-surface separation at which ionization occurs and the ion collection efficiencies. A simple model is presented to justify this assertion and its implications are discussed. Measurements are being extended to surfaces with lithographically-patterned electrode arrays to better test the model and explore the use of Rydberg atoms to investigate local electric fields at nanostructured surfaces.

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