

Abstract Submitted
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Electron Scattering From Laser Excited Ba and Yb Atoms PETER ZETNER, JEFF HEIN, University of Manitoba — Inelastic and elastic electron scattering out of the excited states of Ba and Yb has been studied at low collision energies. We present measurements (at 10 eV and 20 eV collision energies) of differential cross sections and orientation parameters for elastic scattering out of the 6^1P_1 and 5 D levels of Ba and for inelastic scattering out of the 6^3P_1 level of Yb to higher lying 3D and 3S levels. Collision studies are carried out using a momentum selected incident electron beam with momentum resolved scattered electron detection and excited atomic target populations generated by resonant laser radiation. To a good approximation, Ba and Yb are heavy two-electron systems comprising filled, approximately inert cores ($[Xe]$ for Ba and $[Xe]4f^{14}$ for Yb) with two-electron $6s^2$ valence configurations (in the ground state). Theoretical determinations of low-energy electron scattering parameters for these atoms, based on convergent close coupling and first order perturbative formalisms, have met with success in many cases. Such calculations have been applied to inelastic scattering from 6S, 5D and 6P target states in Ba and the 6S ground state in Yb (refs 1,2). Extension of previous experimental investigations to the new scattering processes described in this work will further test the efficacy of available theoretical methods. 1. I. Bray et al. *J.Phys.B:At.Mol.Opt.Phys.* **35** R117 (2002) 2. B Predojevic et al. *J. Phys. B: At. Mol. Opt. Phys.* **38** 3489 (2005)

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