

Abstract Submitted  
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**Electron Impact Induced Excited-State to Excited-State Transitions in Yb** JEFF HEIN, PETER ZETNER, University of Manitoba — The Yb atom (ground state electron configuration:  $[\text{Xe}]4f^{14} 6s^2 \ ^1\text{S}_0$ ) is a heavy two-electron system in which spin-orbit coupling effects play a significant role in the electronic level structure. More experimental data for scattering from this atom are becoming available, motivating the application of recent theoretical methods to this system<sup>1-4</sup>. The non-negligible role of spin-orbit coupling suggests that a relativistic theoretical formalism may be required. We have extended our scattering studies out of ground ( $6s^2 \ ^1\text{S}_0$ ) state target atoms to excited ( $6s6p \ ^3\text{P}_1$ ) atoms using laser excitation of the atomic beam. Measurements of the inelastic differential cross section for the excitations  $6s6p \ ^3\text{P}_1 - 5d6s \ ^3\text{D}$  and  $6s6p \ ^3\text{P}_1 - 6s7s \ ^3\text{S}_1$  are presented for 20 eV collision energy. Additionally, by employing circularly polarized laser light in the preparation of the  $^3\text{P}_1$  target state, we are able to measure the  $\text{P}_3$  Stokes parameter for these excitations. 1. P.V. Johnson et al. J. Phys. B: At. Mol. Opt. Phys. **31** 3027 (1998) 2. P.W. Zetner et al. J. Phys. B: At. Mol. Opt. Phys. **34** 1619 (2001) 3. B Predojevic et al J. Phys. B: At. Mol. Opt. Phys. **38** 1329 (2005) 4. B Predojevic et al J. Phys. B: At. Mol. Opt. Phys. **38** 3489 (2005)

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