

Abstract Submitted  
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**Ionic Dipole and Quadrupole Matrix Elements from Non Adiabatic Core Polarization**<sup>1</sup> EDWARD SHUMAN, TOM GALLAGHER, University of Virginia — The radial matrix elements connecting the ionic  $Ba^+$  state to low lying excited  $6p$  and  $5d$  states can be extracted from the K splittings of the bound  $6sn\ell$  states. We develop an expression for the K splitting by a pair of expansions. Comparison of the contributions from different ionic states confirms that all but the lowest two may be safely ignored. Finally we extract the radial  $Ba^+$  matrix elements  $\langle 6s|r|6p\rangle$  and  $\langle 6s|r^2|5d\rangle$ .

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