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**Rydberg Ion Fine Structure Measurements with the RESIS Method**<sup>1</sup> C.W. FEHRENBACH, Kansas State University, S.R. LUNDEEN, Colorado State University — Measurements of Rydberg fine structure provide precise determinations of positive ion properties such as polarizabilities and permanent moments. The Resonant Excitation Stark Ionization Spectroscopy (RESIS) method, which has provided a range of such measurements in neutral atoms and molecules [1], has recently been extended to study of Rydberg ion fine structure. In principal, the method can be applied to study positive ions of arbitrary charge. The factors limiting signal to noise and frequency resolution in measurements of this type will be discussed, and some possible future applications will be described. [1] S.R. Lundeen in *Advances in Atomic, Molecular, and Optical Physics*, edited by Chun C. Lin and Paul Berman (Academic Press, 2005), Vol 52, pp. 161-208

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