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Recurrence Spectroscopy of Autoionizing Rydberg Argon in an Electric Field J.D. WRIGHT, J. DISCIACCA, J.M. LAMBERT, H. FLORES-RUEDA, T.J. MORGAN, Wesleyan University — Previously, we have performed single uv-photon excitation of metastable argon to spin-orbit autoionizing states between the first and second fine structure ionization limits. [1] A pulsed frequency-doubled dye laser excites the valence electron to a Rydberg state and excites the ionic core from j=1/2 to j=3/2. The core then relaxes and ejects the Rydberg electron. We have developed a new apparatus that allows us to measure these autoionizing states in an electric field using a fast beam. Using this apparatus we have extended the field-free measurements to probe the semi-classical dynamics of this system in an electric field using the method of recurrence spectroscopy [2]. Recurrence spectra for the autoionizing states in an electric will be compared to the corresponding spectra in the bound state region. Work supported by National Science Foundation. [1] J.D. Wright, P.A. Walker, J.H. Gurian, M. van Lier-Walqui, J.M. Lambert, H. Flores-Rueda, and T.J. Morgan; Bulletin of the American Physical Society (2004) [2] M L Keeler, H Flores-Rueda, J D Wright, and T J Morgan; J. Phys. B. 37, 809-815 (2004)

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