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Rotational-state-selective field ionization of triplet molecular Rydberg states of H_2 WILL SETZER, JAMES DIETZ, DYLAN JONES, T. J. MORGAN, Wesleyan Univ — We present rotational-state-selective field ionization spectra of highly excited triplet Rydberg states of molecular hydrogen. The experimental technique employs a fast 6 keV Rydberg molecular beam and a tunable static electric field of up to 40 kV/cm. The metastable c $^3\prod_u^-$ $2p\pi$ state, prepared by electron capture of 6 keV H_2^+ ions in potassium vapor, is excited by a frequency doubled tunable dye laser to access the v=0 R(1)nd1 (n=21-27) Rydberg series. In each Rydberg state's field ionization spectra we observe multiple classical field ionization thresholds corresponding to the rotational states of the H_2^+ core. A model, based on diabatic traversal of the Stark map, is used to explain the data.

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