Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Ion-Pair States in Ungerade Molecular Hydrogen[1] ELIZABETH MCCORMACK, Bryn Mawr College — The results of an investigation of long-range ungerade states of molecular hydrogen are reported. Resonantly enhanced multi-photon ionization via the E,F 1?+g , v = 6, J = 0, 1, and 2 states is used to probe the energy region above the H(1s) + H(3l) dissociation threshold. Both molecular and atomic ion production are detected as a function of wavelength by using a time-of-flight mass spectrometer. A series of resonances is observed with energies that agree with the predictions of a mass-scaled Rydberg formula for bound states of the H+H- ion pair. Measured quantum defects, rotational dependencies, and line widths are reported. The observed spectra are compared to recent theoretical predictions for the series, which include line widths that oscillate in magnitude with energy and perturbations with several interloping resonances corresponding to vibrational states trapped inside the barriers of the 5 and 6 1?+u potential-energy curves [1].

[1] A. Kirrander and Ch. Jungen, Phys. Rev. A. 84, 052512 (2011).

[1]This work is supported by the NSF.

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Date submitted: 25 Jan 2012 Electronic form version 1.4