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Ion-Pair States in Triplet Molecular Hydrogen W. SETZER, B. C. BAKER, Wesleyan Univ, S. ASHMAN, Providence College, T. J. MORGAN, Wesleyan Univ — An experimental search is underway to observe the long range triplet ionic states H^+ H^- of molecular hydrogen. Resonantly enhanced multi-photon ionization of the metastable c $^3\prod_u^-$ $2p\pi$ state is used access to the R(1)nd1 n=21 Rydberg state that serves as an intermediate stepping stone state to probe the energy region above the ionization limit with a second tunable laser photon. The metastable state is prepared by electron capture of 6 keV H_2^+ ions in potassium in a molecular beam. Formation of the H^+ H^- triplet configuration involves triplet excited states of the H^- ion, especially the $2p^2$ $^3P^e$ state, the second bound state of H^- predicted to exist with a lifetime long compared to typical auto ionization lifetimes but not yet observed experimentally. Details of the experiment and preliminary results to date will be presented at the conference.

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