Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

On the rate of dissociative recombination of H_3^+ in recent afterglow plasma experiments[1] VIATCHESLAV KOKOOULINE, IVAN MIKHAYLOV, Department of Physics, University of Central Florida — Determination of the rate of the dissociative recombination (DR) in H_3^+ has been a cotroversal issue for several decades. At present, the experimental rate about $7-9\times10^{-8}$ cm^3/s at 300 K obtained from several independent storage ring experiments seems to be the most reliable for the ground state of H_3^+. There is only one major persistant issue: Two recent experiments in flowing and stationary afterglow plasma with H_3^+ made by Glosik and collaborators demonstrated a significant dependence of the DR rate as a function of density of molecular hydrogen, which is present in the plasma. In this study we are suggesting a model that explains the observed dependence of the DR rate on the density of H_2. The model is based on the long-living metastable states of H_3^* created in the decaying stationary or flowing plasma.

[1]This work is supported by NSF-ITR grant #PHY-0427460

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Date submitted: 01 Feb 2006 Electronic form version 1.4