

DAMOP13-2013-000706

Abstract for an Invited Paper  
for the DAMOP13 Meeting of  
the American Physical Society

**Proton-hydrogen collisions for Rydberg  $n,l$ -changing transitions in the early Universe<sup>1</sup>**

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Cosmic Microwave Background (CMB) is a vestige radiation generated during the Recombination era, some 390,000 years after the Big Bang, when the Universe had become transparent for the first time. Initial observations of CMB made by the Wilkinson Microwave Anisotropy Probe (WMAP) led to determining the age of the Universe. The mechanisms that drove the recombination have been discovered by using modeling of the primordial plasma and seeking agreement with the observations. The new Planck Surveyor Instrument launched in 2009 is expected to produce data about the recombination era of an unprecedented accuracy, that require including better information regarding the basic atomic physics processes into the present models. In this talk, I will review the results for various Rydberg atom - charge particle collisions and establish their relative importance during the stages of recombination era, with respect to each other and to radiative processes. Energy changing and angular momentum changing collisions with electrons and ions are considered.

<sup>1</sup>This work has been supported by NSF through grants to the Institute for Theoretical Atomic and Molecular Physics at Harvard Smithsonian Center for Astrophysics and to the Center for Research on Complex Networks at Texas Southern University.