

Abstract Submitted
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Electron Temperature measurement using Spectroscopic measurements of Balmer's ratio in PFRC-II Pulsed Hydrogen Plasmas using Collisional Radiative Model.¹ SANGEETA P.VINOTH, ERIC PALMERD-UCA, EUGENE S.EVANS, Princeton Plasma Physics Laboratory, CHARLES P.S. SWANSON, Princeton Satellite Systems, ARTHUR DOGARIU, Princeton University, SAMUEL COHEN, Princeton Plasma Physics Laboratory — A method to determine the electron temperature in PFRC-II based on Spectroscopic measurements of Balmer's ratio, H-beta to H-gamma, using Collisional Radiative (CR) model was studied. The distribution functions of atoms, molecules and ions over their excited states are studied in the framework of CR model. In this model the densities of various excited states of specific atom or ion are expressed as a function of electron temperature, electron density and ratio of density of Molecular neutrals to atomic neutrals. Depending on the experimentally measured Balmer's ratio and ratio of neutral density, the electron temperature was measured. While the error bars are large, it certainly appears to be the case that the electron temperature is 100 eV or above, with even higher temperatures during the initial startup phase. This was confirmed with X-ray diagnostics as well.

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