

ADITYA Experimental Results of Core Ion Temperature Measurements on ADITYA Tokamak Using Four Channel Neutral Particle Analyser

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Core-ion temperature measurements are routinely carried out by the energy analysis of passive Charge Exchange (CX) neutrals escaping out of the ADITYA-tokamak (Minor radius $a=25$ cm, major radius $R=75$ cm) plasma using a 45-degree parallel plate electrostatic energy analyzer [1]. The temporal evolutions of peak ion temperature in the core regime [typically 80 eV to 120 eV for Aditya circular ohmic plasma] as estimated by analyzing the energetic neutral spectrum obtained on four Channeltrons of multichannel data acquisition system [MEASAR-minus-A measurement system for CEM array, Dr. Sjuts optotechnik GmbH, Germany] for several plasma discharges in Aditya, provides an estimate for the core neutral hydrogen [H0] density and its evolution with time. Expected neutral density in the core regime has been estimated for several APPS discharges. The Charge Exchange Diagnostic system on Aditya [2] and data analysis techniques (using numerical algorithms developed) for NPA measurements are also described. Effect of Ion cyclotron radio frequency heating (ICRH) on Ti(0) is observed and reported here, which shows additional increase of Ti(0) up to 60% for the set of plasma discharges investigated herein.

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