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Waves, Currents, Drifts and Plasma Confinement Time in a Low Temperature, Pulsed, Toroidal, ECR Plasma MICHAEL LINDON, West Virginia University, ARVIND THAKUR, P.K. SHARMA, K. SATYANARAYAN, P.R. PARMAR, CHETAN VIRANI, Institute of Plasma Research, EARL SCIME, SAIED HOUSHMYANDAR, West Virginia University, WEST VIRGINIA UNIVERSITY TEAM, INSTITUTE OF PLASMA RESEARCH TEAM — Typically the plasma in purely toroidal field experimental systems is created by a filament source or, in some cases, a helicon plasma source. Here we present measurements of plasma density, electron temperature, flow and confinement time for an electron cyclotron resonance (ECR) created plasma in a purely toroidal field at the Institute of Plasma Research (IPR) in India. A linear array of Langmuir probes was used to measure the density and temperature in a horizontal plane of the torus and a pair or probes is used to measure the vertical electric field arising from charge separation. Mach probes were used to measure bulk plasma flows in the same plane. Through measurements of the decay rate of the plasma density after the 2.45 GHz ECR microwave source turns off, the plasma confinement time as a function of initial toroidal magnetic field strength and fill pressure was investigated. This work was supported by the American Physical Society and the Indo-U.S. Science and Technology Forum (IUSSTF) through the India-U.S. Physics Visitation Program.

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