

Abstract Submitted
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Density Analysis of the HIT-SI Experiment BRIAN VICTOR, ROGER SMITH, CIHAN AKCAY, GEORGE ANDEXLER, DAVID ENNIS, TOM JARBOE, BRIAN NELSON, University of Washington, HIT-SI TEAM — A far-infrared (FIR) interferometer is used to measure the line-integrated density of the Helicity Injected Torus with Steady Inductive current drive (HIT-SI) plasmas. An overview of the FIR system is discussed and recent upgrades to the system are presented. The system uses dual optically pumped difluoromethane gas lasers, with a wavelength of $184.3 \mu\text{m}$, to produce a heterodyne signal with a beat of approximately 2 MHz. This 2 MHz beat allows for the resolution of high-frequency fluctuations of the HIT-SI plasma density. Plasma density is compared to the initial background fill gas pressure and to the “puff” gas pressure to obtain particle confinement information. Based upon the high initial density due to the background fill gas and the subsequent decrease in density, the particle confinement time is estimated. The steady-state density compared to the flow rate from the “puff” gas valves provides a second means of estimating the particle confinement time. Comparison of the FIR density data to the Langmuir probe density data is also presented.

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