Abstract Submitted
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Overview of HIT-SI Progress and Results[1] B.S. VICTOR, C. AKCAY, B.T. DOTY, D.A. ENNIS, R.P. GOLINGO, C.J. HANSEN, A.C. HOSSACK, T.R. JARBOE, K.D. MORGAN, B.A. NELSON, R.J. SMITH, G.J. MARKLIN, University of Washington — The HIT-SI program investigates the formation and sustainment of toroidal current in a simply-connected volume through the use of inductive helicity injectors. High current amplification shots, with toroidal currents up to 3 times the injector currents [B.S. Victor *et al.*, Phys. Rev. Lett. 107, 165005 (2011)], have led to new insights into the current drive process. The Imposed-Dynamo Current Drive (IDCD) model describes a process where the toroidal current is driven directly by injector driven fluctuations [T.R. Jarboe *et al.*, Nucl. Fusion (2012)]. The IDCD model accurately predicts the toroidal current and λ profile. Internal and surface magnetic field measurements show qualitative agreement with computational results from 2-fluid simulations using NIMROD. Simultaneous measurements of ion temperature and velocity data along two linear arrays of 36 fibers will be presented. Progress on HIT-SI3 and a new Thomson scattering system is given. Recent operations have increased the injector driving frequency from 14.5 to near 40 kHz. Higher frequency operations are analyzed with data from an FIR interferometer, IDS, magnetic probes, a high-speed imaging system and a Langmuir probe.

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