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Driving Fast Flows with Volumetric Current Drive[1] JASON MILHONE, D. ENDRIZZI, K. FLANAGAN, M.D. NORNBERG, E.E. PETERSON, C.B. FOREST, University of Wisconsin-Madison — Volumetric current drive has been shown to be an efficient method for driving fast flows with high Rm for studying the onset of flow-driven plasma instabilities. High performance plasmas are produced with 20 kW of electron cyclotron heating (ECH) and thermally emissive lanthanum hexaboride cathodes. Plasma flow is achieved by injecting current through the plasma across an externally applied weak magnetic field setting up a $J \times B$ body force on the plasma volume. Two scenarios for volumetric current drive have been demonstrated. The first injects current across a weak uniform axial magnetic field driving a Keplerian-like flow for magneto-rotational instability (MRI) studies. The second injects current across a weak quadrupole magnetic field for driving a von Karman-like flow for dynamo studies. First results measuring velocity and ion temperature profiles measured by a Fabry-Perot interferometer are shown. Detailed mach probe flow measurements show stronger flow shear in volumetric current drive compared to previous edge-driven plasma flow experiments.

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