Abstract Submitted
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**Helioseismology in the Lab** ETHAN PETERSON, MATTHEW BROOKHART, MIKE CLARK, CHRIS COOPER, JAN EGEDAL, JOHN WALLACE, DAVID WEISBERG, CARY FOREST, University of Wisconsin - Madison, MPDX TEAM — A novel diagnostic technique for measuring plasma flows in the Madison Plasma Dynamo Experiment (MPDX) has been designed and implemented. The technique, inspired by helioseismology, launches ion acoustic waves from the boundary of a spherical (1.5m radius), unmagnetized, spinning plasma and measures the doppler shifted wave at two longitudinal locations of the same latitude. These two measurements yield a line integrated velocity measurement from the source to the receivers. The ion acoustic waves are produced via the mode conversion of a magnetosonic wave excited by a current loop antenna located in the confining cusp field of MPDX. Probe measurements of the electric field in the plasma and the magnetic field fluctuations (Bdot) in the cusp are used to observe the wave and deduce velocities along two chords. This technique is used to measure 10km/s flows and to validate mach probe measurements near the edge of the plasma. The Bdot measurements in the cusp provide the proof-of-concept for a surface array of probes to measure global velocities.

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