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**Experimental studies of MHD flow in a rapidly rotating system** DOUGLAS H. KELLEY<sup>1</sup>, DANIEL S. ZIMMERMAN<sup>2</sup>, SANTIAGO ANDRES TRIANA<sup>3</sup>, DANIEL P. LATHROP<sup>4</sup>, University of Maryland — We present experimental studies of fluid flow in a spherical vessel with either shear- or propeller-driven flows. Our work is motivated by the numerical results of Dudley and James (1989), who found dynamo action in flows of this geometry (so-called  $S_1T_1$  flow). Using liquid sodium as a test fluid, we apply an external magnetic field (up to 400 G) and image the induced field with an array of Hall probes near the surface of the vessel. A rich variety of dynamics occur at various rotation rates, including oscillatory behaviors, likely to be indicative of inertial waves in shear-driven flow or magnetocoriolis (MC) waves in propeller-driven flow. The detailed characteristics and dynamics of these waves, as well as their interaction with a turbulent ( $Re \sim 10^7$ ) background flow, are the subject of ongoing research. Our work has implications for dynamo action, thought to produce the magnetic fields of stars, accretion disks, and planets, including Earth.

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