

Abstract Submitted
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Spin-up and Spin-down in a Spherical Annulus MATTHEW ADAMS, SANTIAGO TRIANA, DANIEL ZIMMERMAN, DANIEL LATHROP, University of Maryland, College Park — We present experimental studies of turbulent fluid flow in a spherical annulus with approximate radius ratio $1/3$ that is spun up and spun down. One experimental apparatus uses water as the working fluid, and provides localized measurements of velocity, wall shear, and pressure. The other experimental apparatus has sodium as the working fluid, and uses magnetic field measurements to extract information about the global flow within the device. The geometry of the experiments makes these studies potentially applicable to geophysical and astrophysical bodies. In particular, Mercury is known to have an at least partially fluid core, and during its orbit its rotation rate increases and decreases periodically. Preliminary results of spin-down indicate a transfer of energy to the so-called spin-over mode as the turbulence decays after the outer and inner spheres have been brought to a stop.

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