Geophysical Research Abstracts, Vol. 9, 08867, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08867

Hydromagnetic waves in a sodium spherical Couette flow experiment

T. Alboussière, D. Brito, P. Cardin, N. Gagnière, D. Jault, H-C. Nataf and **D. Schmitt**
LGIT, CNRS-UJF, Grenoble, France (Denys.Schmitt@obs.ujf-grenoble.fr)

Hydromagnetic waves are propagating oscillations occurring in electrically conducting fluids moving in the presence of magnetic field. Their characteristics depend on the leading forces in balance (inertial, magnetic, Coriolis-type...). They are expected to be present in the liquid outer core of the Earth and could possibly play a role in decadal and centennial changes of the geomagnetic field and in the geodynamo. Here we report evidence of such waves in a spherical Couette flow experiment using sodium as the working fluid, in the presence of a strong dipolar magnetic field. Different types of waves with specific characteristics have been detected by using several probes, either located outside the fluid (magnetic field sensor), as in the observation of the geomagnetic field, or closely related to the flow in volume (difference of electric potential, dynamical pressure, ultrasonic Doppler velocimetry), a configuration not realizable in geophysics. Dispersion relations have been tentatively determined. They are analyzed within the scope of the existing theories, keeping in mind that the latter do not strictly apply to our experimental configuration.