The (3,4) Spherical Mode Interaction in the GEOFLOW-experiment and Astrophysical Framework

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Simulation of dynamics in the spherical Rayleigh-Benard problem is relevant to better understand large-scale convective motion in an astrophysical framework. During the preparation of the GEOFLOW- experiment we found out that, for the (3,4) spherical mode interaction, interesting intermittent-like behaviour can be occur. Because of the dielectrophoretic central force field in this experiment varies as $1/r^5$ it differs from the gravity force fields encountered in astrophysics. In this talk, we purpose to (i) study thoroughly these dynamics and (ii) to compare the resulting dynamics with the cases where the central force field varies as $1/r^2$ (Earth's outer core) or as r (Earth's mantle) for the $(3,4)$ interaction. Both cases show complex time- dependent dynamics, but we point out important qualitative differences with the GEOFLOW-experiment.