The study of precession-driven flows in ellipsoidal containers has excited over the years a great although not constant interest. The first investigations related to this matter date back to Poincare' (1910). After Poincare', geophysics was the main motivation for further investigations on precession driven flows in connection with the origin of the Earth's magnetic field (Bullard, 1949). Nowadays it is generally accepted that the Earth's magnetic field is generated by motions in the liquid outer core, but the details of this process are still matter of investigation. The generation of magnetic fields by motions in an electrically conducting fluid is called dynamo action. Most geophysicists regard convection driven by thermal or chemical buoyancy as the most likely source of energy for the geodynamo, but the possibility of a dynamo driven by the Earth's precession cannot be rejected. The research work presented in this book intends to examine the fluid motions existing in precessing ellipsoidal cavities and eventually investigate whether the generated velocity fields are suitable to support dynamo action.



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## Fluid instabilities in precessing ellipsoidal shells

Theoretical background and numerical modeling



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