Precession driven dynamo

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It is widely accepted, that the geomagnetic field of the Earth is powered by a magnetohydrodynamic dynamo-process. So far theoretical studies and numerical simulations have mostly assumed that the flow generating the dynamo-process is driven by buoyancy forces. But the Earth precesses due to the gravitational fields of the sun and the moon acting on the equatorial bulge of the Earth. So precession can also be regarded as a viable driving-mechanism.

We have used a numerical model employing a finite-volume method to solve the equations of the precession driven dynamo in a spherical shell. Here we will discuss how precession driven flows are commonly described and what flow structures have to be expected. Some of our results demonstrate that these flows do not always generate a dynamo process.