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# A spherical Taylor-Couette dynamo

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We present a new scenario for magnetic field amplification in the planetary interiors where an electrically conducting fluid is confined in a differentially rotating, spherical shell (spherical Couette flow) with thin aspect-ratio. When the angular momentum sufficiently decreases outwards, a primary hydrodynamic instability is widely known to develop in the equatorial region, characterized by pairs of counter-rotating, axisymmetric toroidal vortices (Taylor vortices) similar to those observed in cylindrical Couette flow. We characterize the subcritical dynamo bifurcation due to this spherical Taylor-Couette flow and study its evolution as the flow successively breaks into wavy and turbulent Taylor vortices for increasing Reynolds number. We show that the critical magnetic Reynolds number seems to reach a constant value as the Reynolds number is gradually increased. The role of global rotation on the dynamo threshold and the implications for planetary interiors are finally discussed.