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**Magnetized spherical couette flow** CHRISTOPHE GISSINGER, Princeton University, HANTAO JI, Princeton Plasma Physics Laboratory (PPPL), JEREMY GOODMAN, Princeton University — Spherical Couette flow, i.e. the flow between differentially rotating concentric spheres, has attracted a revival of interest in recent years. It has been shown that despite the simplicity of the problem,the flow undergoes many bifurcations depending on the value of the Reynolds number and of the aspect ratio. When one considers an electrically conducting fluid and imposes an external magnetic field, magnetohydrodynamic effects can significantly change the purely hydrodynamical problem and lead to new instabilities. We will present numerical simulations of magnetic spherical Couette flow, comparing the effects of different magnetic boundary conditions. We will also show that for some parameters, this problem yields interesting non-linear dynamics, including interaction with dynamo action. Finally, this work can be investigated in the framework of the magnetorotational instability. In particular, we will present a comparison between our numerical simulations and the experimental results obtained by Sisan et al, who used a similar configuration and observed non-axisymmetric MHD instabilities.

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