Taylor-Couette dynamo

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Taylor-Couette flow is one of the most studied problem in fluids dynamics, including the transition to turbulence as Re is increased.

Surprisingly, only a few numerical work has been done on dynamo generated by Taylor-Couette flows. I will present results of 3D direct numerical simulations of the magnetic field generated by a Taylor-Couette flow. I investigate the subharmonic nature of the dynamo action and the effect of turbulent fluctuations on the threshold and the structure of the dynamo.

Different configurations are explored, by varying the geometry of the cylinders, the rotation ratio and the magnetic boundary conditions.

Finally, I discuss new configurations in the perspective of future dynamo experiments.