Contributed Talk

Splinter Activity

Axi- to non-axisymmetric dynamo transition in stellar models with varying rotation rate

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Rotation is one key parameter that influences stellar magnetic activity and there is growing evidence that it also plays a role in the transition from solar-like axisymmetric dynamo modes to non-axisymmetric modes on more rapidly rotating stars. In order to study this transition, we perform a set of simulations, using semi-global magneto-convection models in which rotation is systematically varied.

To estimate the dynamo efficiency at increasing rotation, we compare the magnetic energy to the kinetic energy and we found that the ratio magnetic-to-kinetic energy increases with rotation. We decompose the magnetic field in spherical harmonics and calculate the energy contained in the large-scale field and in the small-scale fluctuations. We found that at high rotation, the first non-axisymmetric mode is excited, leading to several evidence for an azimuthal dynamo wave.