Highlight

Modeller's view to solar and stellar dynamos: perspectives and challenges

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Thanks to the steadily increasing computational resources, global convection simulations of stars of various types are becoming abundant. Even though these models still are - and will to some extent always be - only toy models of the real objects, they provide us very useful information, if properly exploited. The challenge is to be able to meaningfully analyse the massive data and develop tools with which one is able to establish which physical effect is responsible for a certain phenomenon emerging in the models - also those arising from turbulent effects, posing the greatest challenges.

Highlights of recent modelling efforts include the emergence of solar-like dynamo solutions without a tachoclinic shear layer, dynamo solutions with multiple cycles of different lengths and spatial distributions, models that spontaneously generate irregular behavior and grand-minima type epochs, and the established transition from axisymmetric to non-axisymmetric modes as the rotation rate is increased. In this talk, these novel findings are reviewed, and their implications for observations are discussed.