Effect of the heat source distribution in the Earth's core on the stability of geodynamo

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We investigate the effect of the heat source distribution on the behavior of the magnetohydrodynamic (MHD) dynamo action. In this study, we consider three models in which the ratio of the heat flow put into the core at the inner core boundary to that extracted away from the core to the mantle varies from 0%, 50% to 100%. The frequently studied model with a temperature difference between the upper and lower boundaries corresponds to the 100% case. An important parameter closely related with the thermal condition is the Rayleigh number, and therefore, we performed a parameter study by changing the Rayleigh number as another control parameter. The results suggest that both the Rayleigh number and the heat source distribution influence the stability of the magnetic field.