Studies of rapidly-rotating convection driven dynamos with low Pm

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We study a set of numerical dynamo models varying the convection strength by a factor of 30 and ratio of magnetic to viscous diffusivities by a factor of 20 at rapid rotation rates ($E = \nu/(2\Omega d^2) = 10^{-6}$) using a heat flux outer BC. This regime has been little explored (aside from a pioneering study by Sakuraba & Roberts) due to the significant computing resources required. Our simulations are carried out using a discretisation of degree and order 256 in spherical harmonics, and 516 finite difference points in radius and parallelized on 516 processors. We report energy spectra of steady solutions, a comparison of volume-integrated characteristics of fields with the proposed rotating convection and dynamo scaling laws, a structure of dynamos deep in the shell and on the CMB in relation to the selection of control parameters.