

Investigation of effects of Earth's rotation on the generated magnetic field structure in the MHD dynamo simulation

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In this numerical simulation to understand basic processes of the MHD dynamo, effects of the rotation in a model of the of the conducting fluid shell have been investigated, adopting three case of the Taylor number (Ta) ; i.e. (a) $Ta = 100$, (b) $Ta = 10000$, and (c) $Ta = 250000$. The results shows that magnetic energy in the shell grow to the same level of kinetic energy in the cases of (b) and (c) , though the magnetic energy grow only up to 10% of the kinetic energy in the case (a) as low rotation. The results also show that magnetic fields extensively generated near the boundary region of the shell in the stage of weak magnetic field intensity, while the intense magnetic fields are generated in the convection cells in the stage of strong magnetic field.