

Investigation of the dynamics and time evolutions of the convection and magnetic field in the MHD dynamo simulation

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For understanding of basic processes of the generation of the geomagnetic field, MHD dynamo simulations in a rotating spherical shell have been carried out. We investigate characteristics of the convection and magnetic field both for the structures and time evolutions when the generated magnetic energy has been increased to about 10 times of the kinetic energy. The results show that the anti-cyclones where axial magnetic field is strongly generated are intensified while the cyclones become weak. The time evolution of the field patterns shows that the magnetic field makes propagation of the column slow down and that the dipole field decays when the anti-cyclones are broken. The number of the remarkable cyclones becomes three in the phase of the maximum field intensity.