Spin-up at Anisotropic Viscosity

Jozef Brestenský
Faculty of Mathematics, Physics and Informatics, Comenius University[1]

Tomáš Šoltis
Geophysical Institute of Slovak Academy of Sciences[2]

A b s t r a c t : Boundary layers in many models of Geodynamo (Dormy and Soward 2007) significantly or at least non-negligibly influence some processes. In the Earth's core basic forces may cause anisotropic diffusivities of the electrically conducting fluid (Šoltis and Brestenský 2010). Thus the anisotropic viscosity may influence the role of boundary layers of the Ekman layer type in generating secondary flows in fluid. In the horizontal fluid layer rotating around vertical axis the process of spin-up is studied. The attention is focused on its dependence on the anisotropic viscosity which is isotropic in horizontal directions, but the vertical viscosity is different from the horizontal one. Anisotropic parameter (Šoltis and Brestenský 2010), α, is used, in order to quantify the precision of generally accepted approximation, $\alpha = 0$, in the Ekman layer problems (Dormy and Soward 2007). The model with anisotropy by Braginsky and Meytlis (Dormy and Soward 2007) is also discussed.

Key words: Earth's core, Ekman boundary layer

References

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[1] Department of Astronomy, Physics of the Earth and Meteorology, Comenius University, 842 48 Bratislava, Slovakia, e-mail: brestensky@fmph.uniba.sk

[2] Dúbravská cesta 9, 845 28 Bratislava, Slovakia, e-mail: geoftoso@savba.sk