MARGINAL STABILITY OF THE PLANAR LAYER IN EQUATORIAL REGIONS WITH ANISOTROPIC DIFFUSIVITIES.

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The influence of anisotropic diffusive coefficients on marginal stability of the horizontal fluid planar layer rotating about horizontal axis and permeated by a horizontal homogeneous magnetic field is studied. The linear stability analysis is performed using separable solution in the form of horizontal rolls. Both, stationary and overstable motions, are examined. Anisotropy of diffusive coefficients (thermal diffusivity and viscosity) is considered. Adopting the conclusions of Braginsky and Meytlis the turbulent diffusivities are enhanced in the *x*-direction of rotation, $\boldsymbol{\Omega} = \Omega_0 \hat{\boldsymbol{x}}$, and in the *y*-direction of the magnetic field, $\boldsymbol{B} = B_m \hat{\boldsymbol{y}}$, in comparison with vertical *z*-direction. This anisotropy $(\kappa_{xx} = \kappa_{yy} > \kappa_{zz},\ \nu_{xx} = \nu_{yy} > \nu_{zz})$, called BM anisotropy, is in this orientation of axis of rotation formally the same like oceanic type of stratification anisotropy (SA) considered in our former studies, because rotation and magnetic field are both in horizontal directions. In SA anisotropy due to density stratification determined by gravity, $\boldsymbol{g} = -g\hat{\boldsymbol{z}}$, the diffusive coefficients have different values in *z*-direction and the ones in the horizontal directions, *x* and *y* (in oceanic (atmospheric) SA type anisotropy the horizontal diffusivities are greater (smaller) than vertical diffusivities). The influence of anisotropy on ΛE (Elsasser and Ekman numbers) regime diagram showing the regions of preference of oblique, cross and parallel steady rolls is studied. BM anisotropy decreases the domain of preferred oblique rolls (atmospheric SA anisotropy increases it) and impedes convection by decreasing critical Rayleigh number (atmospheric SA anisotropy enhances it). The influence of anisotropies on basic parameters describing overstable modes (wave numbers, frequency, angle between axis of rolls and basic magnetic field) is also studied. Study of importance of inertial terms shows, that these terms are relatively unimportant and can be neglected. In the case of inviscid overstable modes the Λq regime diagram is studied. Comparing the results from the case with vertical axis of rotation, there is significant difference, because the unique property of BM anisotropy (in the case of vertical axis of rotation the *BM* anisotropy handicapes the overstability by reducing the ranges of Elsasser number as well as Ekman number at which the overstability exists) is not present in the model with here studied horizontal axis of rotation.

anisotropic diffusive coefficients, rotating magnetoconvection, geomagnetic field

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