MHD Kelvin-Helmholtz instability in non-hydrostatic equilibrium

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Abstract

The present work dealt with the linear stability of a magnetohydrodynamic shear flow so that a stratified inviscid fluid subject to a thermal wind is rotating about a vertical axis when a uniform magnetic field is applied in the direction of the streaming or zonal flow.

In geophysical flow, the stability of the flow is determined by taking into account the non- hydrostatic condition depending on Richardson number R_i and the deviation δ from hydrostatic equilibrium. According to P.H.STONE [1] it is shown that such deviation δ decreases the growth rates of three kinds of instability which can appear as geostrophic (G), symetric (S) and Kelvin-Helmholtz (K-H) instabilities.

To be specific, the evolution of the flow is therefore considered in the light of the influence of magnetic field, particularly, on K-H instability. Results are discussed and compared to previous works as S.CHANDRASEKHAR [2].

References:

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