

On the mathematical properties of non-linear atmospheric flows counting with heat conductivity, vertically stratified density, rotation of the Earth, humidity and moisture content in the clouds.

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We construct an explicit solution of a non-linear Navier-Stokes type system of partial differential equations which describes the behavior of the Atmosphere of the Earth taking into account various simultaneous parameters; such as rotation, initial exponentially decreasing vertical stratification of density, heat conductivity, humidity and moisture content in the clouds. To construct the explicit algorithm of the solution, we use the Galerkin method.

We prove the existence and uniqueness of the solution for a limited interval of time.

For the linearized model, we find the structure and localization of the spectrum of internal vibrations of the Atmosphere.

The results may find theoretical application in Atmosphere fluid dynamics, as well as more practical application in weather forecasting.

Keywords: atmosphere flows, explicit numerical solution, humidity and moisture content in the clouds, vertical stratification of density, existence and uniqueness of solutions of PDE systems, spectrum of internal waves