



Modeling of circulation in sub-glacial lake Vostok

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Formulation of 3D not-hydrostatic hydrodynamic model in variables vorticity-vector potential is presented. The model was developed for calculation of circulation and thermal regime of the subglacial lake Vostok. The method of solution of finite-difference equations, approximating the initial system of differential equations, is shown as well. Examples of the solutions of convective currents in reservoirs of idealized form are shown. The latter cannot be modeled by hydrodynamic models utilizing hydrostatic approximations. The results of modeling the large-scale circulation of the lake Vostok are presented together with the corresponding phenomena, such as freezing/thawing of ice at the ice ceiling of the lake and distribution of suspended solids in different parts of the reservoir.