WAVES IN THE VISCOUS FLOW OF THE "FRICTIONAL CLAY" IN THE FAULT AS A MECHANISM OF THE RUPTURE-LIKE REGIME OF POSTGLACIAL REBOUND

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Abstract. The problem of thermally activated creep at the normal fault is solved analytically in the linear-exponential (Frank-Kemenetsky) rheology approximation. The thickness of the layer deformed and frictionally heated in the vicinity of the fault plane as well as the temperature distribution and the shear stress across the fault (~0.01 MPa) are calculated as functions of the relative fault sides velocity. Perturbations in the form of the waves in the "frictional clay" (the buoyant overheated lithosphere material in the fault) are taken into account and the maximum frequency of the perturbations of velocity and the thickness of the "frictional clay" upwelling flow are calculated. The existence of the maximum frequency of perturbations of velocity in the vicinity of fault plane puts constraints on the regime of the lithospheric block postglacial rebound forcing the lithosphere upwelling to occur in the rupture-like way with a typical period of ~100 a. The rupture-like regime of the Earth surface uplift is probably responsible for the formation of the dated beach terraces by which the postglacial rebound "history" is traced.

Keywords: postglacial rebound, rupture-like slip on fault, instability of convective flow.