Transient growth of 3D perturbations in a stratified mixing layer flow HELENA VITOSHKIN, Tel-Aviv University — Three-dimensional non-modal disturbances growth in a stably stratified viscous mixing layer flow is studies. The research is performed in the framework of linearized equations using two indepndent approaches and then is verified by computational modeling of evolution of the optimal perturbations found via numerical solution of fully non-linear time-dependent Boussinesq equations. We examined the effect of stratification on linearly stable three-dimensional disturbance, which attains the largest non-modal amplification in the non-isothermal case. The transient strong amplification could be reached at short times by a 3D optimal perturbation, whose amplitude grows larger than those computed in the 2D case, even in cases of very strong stable stratification. This non-modal growth is governed mainly by the Holmboe modes, and does not necessarily weaken with increase of the Richardson number.

Helena Vitoshkin
Tel-Aviv University

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