

**Meeting:** 1001, Evanston, Illinois, SS 11A, Special Session on Stability Issues in Fluid Dynamics

1001-76-326      **Natalya Popova\*** (npopov1@uic.edu), University of Illinois at Chicago, MSCS Department (MC 249), 851 South Morgan Street, Chicago, IL 60607. *The effect of gravity modulation on the onset of filtrational convection.* Preliminary report.

The effect of vertical harmonic oscillations on the onset of convection in an infinite horizontal layer of fluid saturating a porous medium is investigated. Constant temperature distribution is assigned on the rigid impermeable boundaries. The mathematical model is described by equations of filtrational convection in the Darcy-Oberbeck-Boussinesq approximation. Linear analysis of the stability of the quasi-equilibrium state is performed by using the Floquet method. Employment of the continued fractions method allows derivation of the dispersion equation for the Floquet exponent in the explicit form. The Floquet spectrum is investigated analytically and numerically for different values of the Rayleigh number  $Ra$  and oscillation frequency and amplitude. The neutral curves of the Rayleigh number as a function of the horizontal wave number,  $Ra(\alpha)$ , are constructed for the synchronous and subharmonic resonant modes. The regions of parametric instability contoured by  $Ra(\alpha)$  are investigated under different values of oscillation frequency and amplitude. Asymptotes for the neutral curves are constructed for the case of high frequency using the method of averaging and, for the case of low frequency, using the WKB method. (Received August 30, 2004)