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Long-wavelength Marangoni convection in liquid layer with insoluble surfactant in modulated thermal field ALEXANDER MIKISHEV, ALEXANDER NEPOMNYASHCHY, Technion — Marangoni convection in a horizontal liquid layer with an insoluble surfactant distributed on the flat nondeformable free surface is considered. The temperature flux applied to the rigid bottom boundary of the horizontal layer is modulated periodically near a fixed mean value. On the free surface the Biot number is assumed to be small (poorly conducting surface). The surface tension varies linearly with temperature and surface concentration. It has been found formerly that in the absence of temperature flux modulations there exist two longwave instability modes, monotonic and oscillatory ones, which determine the instability threshold. The linear analysis shows that in the case of the monotonic mode, the periodic modulation of the heat flux increase the critical Marangoni number. This effect is especially strong in the region of a small modulation frequency. In the case of the oscillatory mode the influence of modulation depends on the parameters of the problem. A weakly nonlinear analysis near the stability threshold is performed. The reseach was supported by the grant #3-5799 of the Israeli Ministry of Science and partically supported by the EU via the FP7 Marie Curie scheme (grant #PITN-GA-2008-214919 (MULTIFLOW).

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