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Onset of Marangoni convection of a liquid layer with insoluble surfactant in modulated thermal field ALEXANDER MIKISHEV, Strayer University - Katy Campus, Houston, TX — A horizontal layer of an incompressible liquid layer bounded by rigid lower plane and free non-deformable flat upper surface is considered. The layer is heated from below and the heat flux is varying with time around fixed mean value. On the free surface the liquid adsorbs an insoluble surfactant, whose local concentration changes with time due to the advection and diffusion. The linear stability analysis with respect to disturbances of arbitrary finite wave-numbers is performed. Two response modes of the convective system to an external periodic stimulation have been found, the first one with a period of oscillation twice as the period of heat flux modulation (subharmonic mode) and the second one with the same period (synchronous mode). The neutral stability curves are presented for a variety of external conditions. The cellular and long-wave instability thresholds are compared.

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