

# **Fluid flow structures in an evaporating droplet depending on ambient temperature and properties of liquid and substrate**

*Alexandra Gavrilina,<sup>1,2</sup> Lev Barash<sup>1,2</sup>*

<sup>1</sup> Landau Institute for Theoretical Physics, 142432 Chernogolovka, Russia

<sup>2</sup> National Research University Higher School of Economics, 101000 Moscow, Russia

We investigate numerically quasi-steady internal flows in an evaporating sessile droplet. We jointly take into account the hydrodynamics of an evaporating sessile drop, effects of the thermal conduction in the drop, and the diffusion of vapor in air. The equations have been solved by finite element method using ANSYS Fluent.

Temperature distributions and the corresponding vortex structures in evaporating sessile droplets are obtained. The “phase diagrams” containing information on the number and orientation of the vortices depending on the ratio of substrate to fluid thermal conductivities and the contact angle, are presented and analyzed for different values of ambient temperature and for liquids of different volatility.

This work was supported by grant № 18-71-10061 from the Russian Science Foundation.