

# The capillary vibrations method to study interfacial tension of eutectic gallium alloys on layered materials: Graphite, pyrite and gallium selenide

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The dynamical method for measuring the interfacial tension between liquid metals and solid substrates by means of capillary vibration excitation is implemented. Both droplet-substrate fixed and mobile contact line are investigated. Fixed contact line can be realized for contact angle less than  $90^\circ$  and for small surface vibration amplitudes, otherwise the second case takes place. The capillary frequencies for fixed contact line do not depend on substrate properties while for mobile contact line the frequency depends on not only liquid-gas tension but on liquid-substrate tension too. The resonance frequencies of vibrations of gallium microdroplets and its eutectic alloys on substrates of pyrite, highly oriented graphite, and gallium selenide have been obtained. The interpretation of the experimental results was carried out within the framework of approach with used Green's function in analytical form [1]. For the mobile contact line, the eigenfrequencies were found within numerically approaches that have been developed in the work [2].

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[1] Strani M and Sabetta F 1984 *J. Fluid Mech.* **141** 233–247

[2] Sakakeeny J and Ling Y 2021 *Phys. Fluids* **33** 062109