

Terahertz spectroscopy as a probe for low-energy phenomena in nano-systems

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Terahertz spectroscopy is one of the most powerful techniques used for the study of low-energy phenomena in condensed matter. We present two sets of our recent results on the study of superconductivity in MoRe thin films and of the energy states of lithium atoms confined within nanocages of C₆₀ fullerenes (Li@C₆₀PF₆). Using time-domain terahertz spectroscopy, we determined fundamental parameters of MoRe in the normal and superconducting states and showed that superconductivity is suppressed in thinner films due to surface effects [1]. In Li@C₆₀PF₆, we discover a rich set of terahertz-infrared excitations (terahertz part shown in Fig.1) and elucidate their nature.

The terahertz-infrared experiments on Li@C₆₀PF₆ and spectral analysis were supported by RFS grant 23-22-00105. B.P. Gorshunov thanks Ministry for Science and Education of Russian Federation (project 075-15-2024-632).

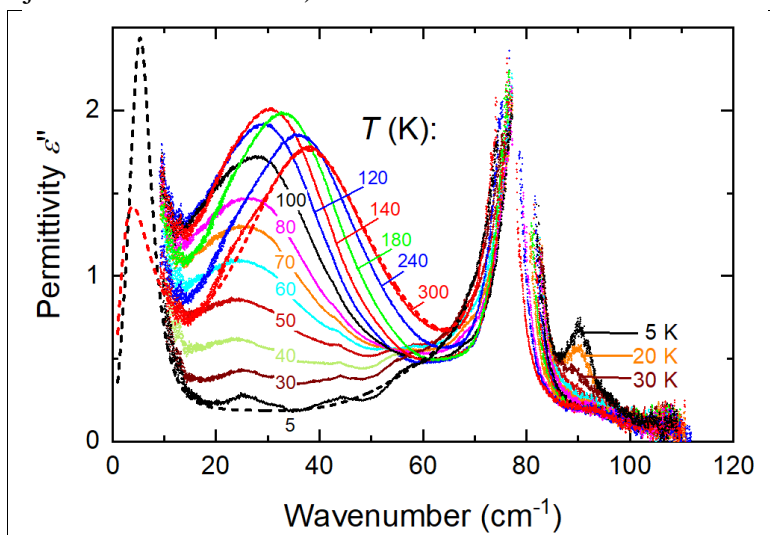


Fig.1. Absorption resonances in the terahertz spectra of imaginary permittivity of Li@C₆₀PF₆.

Bibliography

[1] E.S.Zhukova *et al.* Mesoscience & Nanotechnology, **1**, 01002 (2023).