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Thermal transport in suspended graphene probed by Raman spectroscopy

Thermal properties of graphene present great potential of applications in science and technology. Indeed, theory predicts hydrodynamic to ballistic regimes of thermal transport in graphene [1,2]. Even though the reports for electronic hydrodynamic regime is confirmed experimentally, exploration of the thermal counterpart remains an open problem [3]. One possible limitation of thermal experiments is the strong thermal coupling of graphene with a supporting substrate. To address this issue, we suspend CVD grown graphene over holes of different size to study the thermal transport by using 2-laser Raman thermometry [4]. A temperature calibration of the G mode allows us to correlate observed Raman shift to a temperature, which results in spatially resolved heat maps. We will discuss the temperature profile observed which shows deviation to the classical Fourier's law..

References

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