Thermal conductivity of free-standing single-layer graphene and influence of nanohole effect

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Graphene has ultra-high thermal conductivity due to its unique atomic structure. In this talk, I would like to introduce a T-type method for measuring the thermal conductivity of graphene. Comparing with the normal optical method, the T-type method has higher accuracy and it is suitable for the study of the influence of defects on heat conduction in graphene. We grow single layer graphene (SLG) by chemical vapour deposition (CVD), which was subsequently transferred onto a silicon substrate by traditional PMMA methodology. Then, we introduced nanoholes in the suspended graphene by focused ion beam and found that the thermal conductivity of graphene was decreased by about 48%. The new finding leads to a better understanding of the heat transport mechanisms in graphene. Details about the procedure followed for the fabrication of the suspended graphene T-type sensor and of the thermal conductivity measurements will also be described in the talk.