

Raman spectroscopy of layered materials

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Abstract

Raman spectroscopy is a fast, non-destructive optical characterisation technique that exploits inelastically scattered light. While Raman spectroscopy is used in a variety of different fields of research, e.g. in chemistry and biology, it is of particular interest for characterising 2-dimensional (2D) or layered materials. By using Raman spectroscopy for 2D materials we can extract information about e.g. the number of layers, type and amount of doping, strain and defects, which are very important aspects when it comes to using these materials for device applications. In this presentation I will give an overview of the capabilities of Raman spectroscopy with focus on 2D materials. I will start by explaining the physics behind the Raman scattering process in general and in graphene in particular. Then I will move on to Raman spectroscopy of 2D materials and show examples of how it can be used to extract the above-mentioned material properties, before briefly discussing slightly more specialized Raman techniques such as surface and tip-enhanced Raman spectroscopy