"Electrical and optical properties of 1D and 2D materials from a microscopic modelling"

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Abstract

In recent years, 1D and 2D materials, such as carbon nanotubes and transition metal dichalcogenides, have attracted much attention due to their excellent transport and optical properties. Using a Bethe-Salpeter equation, we investigate optical and excitonic properties of MoS2 monolayers in an applied in-plane electric field [1]. We predict a quadratic Stark shift and its scaling with the exciton binding energy, determined by the dielectric environment. I will also discuss electrical contacts in 1D carbon nanotubes [2] and the role of electronic structure modifications caused by the nanotube deformations due to the metal wetting [3].