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Graphene Based Nano-electronic and Nano-electromechanical Devices

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Graphene based nano-electronic and nano-electromechanical devices will be introduced in this presentation. The first part of the presentation will be covered by our recent results on the fabrication and physical properties of artificially twisted bilayer graphene. Thanks to the recently developed contact transfer printing method, a single layer graphene sheet is stacked on various substrates/nano-structures in a controlled manner for fabricating e.g. a suspended graphene device, and single-bilayer hybrid junction. The Raman and electrical transport results of the artificially twisted bilayer indicates the decoupling of the two graphene sheets. The graphene based electromechanical devices will be presented in the second part of the presentation. Carbon nanotube based nanorelay and A new concept of non-volatile memory based on the carbon nanotube field effect transistor together with microelectromechanical switch will be briefly introduced at first. Recent progress on the graphene based nano structures of our group will be presented. The array of graphene resonators was fabricated and their mechanical resonance properties are discussed. A novel device structures using carbon nanotube field effect transistor combined with suspended graphene gate will be introduced in the end of this presentation.

Keywords: Graphene, Nano-electronic Devices, Nano-electromechanical Devices