

High Sensitivity of Graphene-based Sensors – Opportunities and Limitations

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The two-dimensional nature of graphene leads to an extremely high surface-to-volume ratio, which promises ultrahigh sensitivity of graphene-based sensors [1]. The ultimate thinness and high Young's modulus of graphene may be utilized in membrane-based devices with very high resonant frequencies for mass sensing applications [2]. In combination with an impressive stretchability, this may further lead to applications as piezoresistive graphene membrane-based sensors [3]. While the fundamental properties of graphene apparently make it an ideal candidate for such applications, in reality one has to deal with a number of parasitic effects that can influence and falsify the response of a graphene sensor. This talk aims to carefully balance the discussion about the merits and disadvantages of graphene-based sensors based on experimental data.

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