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Title

Absorption of surface acoustic waves by graphene

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Abstract

We present a theoretical study on interactions of electrons in graphene with surface acoustic waves (SAWs). We find that owing to momentum and energy conservation laws, the electronic transition accompanied by the SAW absorption cannot be achieved via inter-band transition channels in graphene. For graphene, strong absorption of SAWs can be observed in a wide frequency range up to terahertz at room temperature. The intensity of SAW absorption by graphene depends strongly on temperature and can be adjusted by changing the carrier density. This study is relevant to the exploration of the acoustic properties of graphene and to the application of graphene as frequency-tunable SAW devices. (21 References).