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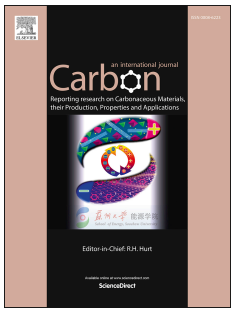

Manipulating graphene kinks through positive and negative radiation pressure effects

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Manipulating graphene kinks through positive and negative radiation pressure effects

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Abstract

We introduce an idea of experimental verification of the counterintuitive negative radiation pressure effect in some classical field theories by means of buckled graphene. In this effect, a monochromatic plane wave interacting with topological solutions pulls these solutions towards the source of radiation. Using extensive molecular dynamics simulations, we investigate the traveling wave-induced motion of kinks in buckled graphene nanoribbons. It is shown that depending on the driving source frequency, amplitude and direction, the kink behavior varies from attraction to repulsion (the negative and positive radiation pressure effects, respectively). Some preliminary explanations are proposed based on the analogy to certain field theory models. Our findings open the way to a new approach to motion control on the nanoscale.

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