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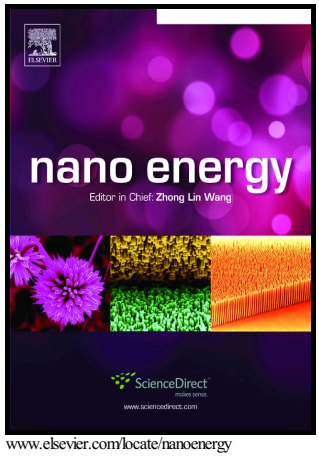

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Abstract

A type of broadband (325 nm - 980 nm) self-powered photodetector based on graphene/GaAs van der Waals heterojunction is reported. By simply spinning a layer of Ag nano-particles (Ag NPs) onto graphene/GaAs heterostructure, the responsivity and detectivity of our devices for the whole spectrum range are enhanced significantly. The maximum photocurrent responsivity of 210 mA W^{-1} (increased by 38%) and detectivity of 2.98×10^{13} Jones (increased by 202%) are achieved at 405 nm, which is about two or three orders of magnitude larger than other graphene based self-powered photodetectors. The mechanism of the improvement originates from the