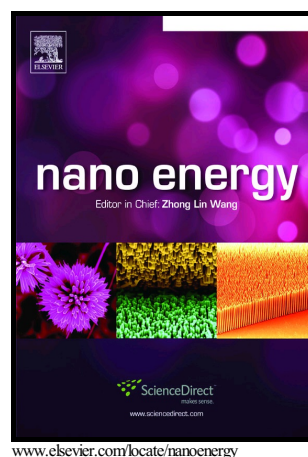


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Broadband Surface Plasmon Resonance Enhanced Self-powered Graphene/GaAs Photodetector with ultrahigh detectivity

Yanghua Lu¹, Sirui Feng¹, Zhiqian Wu, Yixiao Gao², Jingliang Yang³, Yuejiao Zhang³,
Zhenzhen Hao¹, Jianfeng Li³, Erping Li¹, Hongsheng Chen¹ and Shisheng Lin^{1,2,*}

1: College of Microelectronics, College of Information Science and Electronic Engineering, Zhejiang University, Hangzhou, 310027, China

2: State Key Laboratory of Modern Optical Instrumentation, Zhejiang University, Hangzhou, 310027, China

3: State Key Laboratory of Physical Chemistry of Solid Surfaces and College of Chemistry and Chemical Engineering, Xiamen University, Xiamen 361005, China

*Corresponding author. Tel: +86-0571-87951555

Email: shishenglin@zju.edu.cn.

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 2.98×10¹³ 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

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