



Weekly Seminar

(III-Se) and IIISe/Graphene heterostructure Photodetectors

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Time: 4:00pm, June 3, 2015 (Wednesday)

时间: 2015年06月3日 (周三) 下午4:00

Venue: Room W563, Physics Building, Peking University

地点: 北京大学物理楼 W563

Abstract

The 2D materials based optoelectronics devices are very attractive because of their unique dimensional dependent properties. We systematically investigate the dependence of the photoresponsivity on the spacing distance for the two-dimensional (2D) semiconductor based metal-semiconductor-metal (MSM) photodetectors in both the bottom and top Ti/Au contacted device configurations using layered GaSe and InSe. Through spatially resolved photocurrent measurements, we find that the photocurrent is mainly generated from the photoexcited carriers close to the metal-GaSe contacts and the photocurrent active region is always close to the Schottky barrier with higher electrical potential. A theoretical model has also been developed to well explain for the underlying physics for the photoresponse [1]. The response time can be further reduced down to a few hundreds of microseconds for the devices with single layer graphene as metallic electrodes [2]. Our work proves that the 2D based devices could be important for high integrated optoelectronics in the future.

Y. F. Cao, K. M. Cai, P. A. HU, L. X. Zhao, T. F. Yan, W. G. Luo, X. H. Zhang, X. G. Wu, K. Y. Wang and H. Z. Zheng, *Scientific Reports*, 5, 8130 (2015).

(2) W. G. Luo, Y. F. Cao, P. A. Hu, K. M. Cai, Q. Feng, F. G. Yan, T. F. Yan, X. H. Zhang and K. Y. Wang, *Adv. Opt. Mater.*, In press.

About the speaker

王开友, 中国科学院半导体研究所研究员, 博士生导师, 2005年在英国诺丁汉大学天文物理学院获得哲学博士学位。2005年6月—2009年3月在日立剑桥研究实验室作 **Researcher**。曾经两次在波兰科学院物理研究所做访问研究, 并作为访问教授在丹麦玻尔研究所进行短期访问研究。2009年得到中国科学院“百人计划”的资助, 加入半导体研究所超晶格国家重点实验室工作, 并获得“百人计划”终期评估优秀, 2012年获得国家自然科学基金委的国家杰出青年基金资助, 并于2014年获得第五届中国侨界“创新人才”贡献奖。迄今在国际核心刊物和国际会议上合作发表了80多篇科技论文, 发表的文章被引用2400多次。王开友研究员当前的研究兴趣主要是自旋电子学器件及低维纳米器件的物理及功能特性研究。