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The image shows the first page of a research article in Nature Communications. The journal name 'nature communications' is at the top left, with a red box around it and the label '标记出期刊'. The article title is 'Photogating-assisted tunneling for high responsivity and speed of heterogeneous photodetectors'. The authors are listed as 'Mingxiu Liu¹, Jinxuan Wei², Liujian Qi³, Chengwei Qiu⁴, and Lisha Juan⁵', with a red box around the first author's name and the label '标记出第一作者姓名位置'. The article is dated 'Received: 25 July 2023', 'Accepted: 14 December 2023', and 'Published online: 02 January 2024'. The abstract discusses the trade-off between responsivity and speed in photodetectors and introduces a photogating-assisted tunneling mechanism. The footer includes the journal name 'Nature Communications | (2024)15:141' and the page number '1'.

nature communications

Article <https://doi.org/10.1038/s41467-023-44482-7>

Photogating-assisted tunneling for high responsivity and speed of heterogeneous photodetectors

Received: 25 July 2023
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Mingxiu Liu¹, Jinxuan Wei², Liujian Qi³, Chengwei Qiu⁴, and Lisha Juan⁵

whose photodetection gain and response speed can be enhanced simultaneously, overcoming the trade-off between responsivity and speed. We reveal that photogating-assisted tunneling synergistically allows photocarrier multiplication and carrier acceleration through tunneling under an electrical field. The photogating effect in our device features low-power consumption (in the order of nW) and shows a dependence on the polarization states of incident light. Our findings provide a promising solution for high-performance photodetectors, and the rich opportunities provided by atomically sharp heterointerfaces^{11,12-16}. For example, 2D materials photodetectors with ultrahigh responsivity and fast response have been demonstrated, in which the photogating effect dominates the photoresponse¹⁷⁻²⁰. The photodetection gain is $G = \tau / t_c$, where τ and t_c are the photocarrier lifetime and carrier transit time, respectively²¹. Unfortunately, such a mechanism is limited by the photocarrier lifetime, thereby suffering prolonged response time^{20,21,25,26}, with typical values in the order of ns to μ s, which is not suitable for applications such as imaging. The trade-off between high responsivity and fast speed is illustrated in Fig. 1a. A closer scrutiny of the photodetection gain


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Fault-tolerant dynamic force/moment measuring platform for large spacecraft environment using the GAALBP fusion algorithm

Cheng ^{a,b}

标记出个人第一作者 Wang ^{a,b,*}标记出本所第一单位

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Keywords:
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GAALBP

ABSTRACT

The load-sharing platform described ... employed to measure ... dynamic forces from large spacecraft environment, such as sensor failure, a fault-tolerant dynamic measurement ... fault detection approach. The least-squares-based fault-tolerant and non-fault-tolerant ... are then compared ... measuring ... are 26.00% and 16.49%, falling short of the requirements of 10% ... level dynamic calibration approach is thus proposed, which is based on the Genetic Algorithm combined with the least-squares method. ... using results with the trained models show that its fault-tolerant measurement accuracy and coupling rate ... the LS-based fault ... priority of the improved algorithm ... comparing it to competing methods. The aforementioned experimental results show that the proposed ... technique is feasible and can be served as a guide for measuring dynamic forces in spaceflight and resolving sensor failure.

1. Introduction

The ... continue to explore the vast cosmos. To investigate the ... can conduct simultaneous photometric and spectroscopic ... area of 17,500 ... broad wavelength ... whereas the ... detect some WD binaries of high accretion rates [3]. In order to determine how dynamic forces produced by sources in the spaceflight ... performance, ground-based ... loading capacity and broad mounting surfaces due to the growing size and mass of ... sources in spacecraft [4,5], but this can unavoidably result in the introduction of non-linear factors into the system. In addition, it is certain that some sensors would malfunction while detecting dynamic disturbance forces ... As a result, a dynamic force measuring platform that

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发明专利证书

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公开/公告号: CN202011469559.0
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发明人: 李 专利申请人排序

摘要: 一种基于二维材料的多偏振态检测光探测器及其制备方法涉及光电探测技术领域,解决了需求一种不限制二维材料种类且结构简单的偏振光探测器问题,包括基板,设置在基板上的金属电极,设置在基板上的N种纳米条阵列,N种纳米条阵列能够吸收N种偏振角度的偏振光,N为大于等于2的整数,纳米条连接金属电极,纳米条为纳米线或纳米带,纳米条宽度为5nm-5μm,纳米条阵列的材料为具有光电响应能力的二维材料,本发明不限定何种二维材料,具有高偏振灵敏的光吸收,二维材料既充当有偏振效应的光学介质的功能,同时二维材料本身也是探测器件的光响应介质,二者结合实

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