

описанным в [2]. Предложенный метод, в большинстве случаев, обеспечивает достаточную для сравнения различных вариантов топологии точность вычислений, что позволяет значительно упростить решение обратных задач.

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BROADBAND SELF-POWERED PHOTODETECTION USING TiS_2/SI NANOWIRE TYPE-II HETEROJUNCTION

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We present a self-powered broadband photodetector based on a mixed-dimensional n- $\text{TiS}_2/\text{p-Si}$ nanowire (SiNW) heterojunction with Type-II band alignment. The device operates over a wide spectral range (390–940 nm) and demonstrates efficient photodetection under very low illumination intensity ($0.1 \mu\text{W cm}^{-2}$). It achieves a responsivity of 367.52 mA W^{-1} , a detectivity of 2.91×10^{11} Jones, and a quantum efficiency of 48.5%, along with fast response (27 ms) and recovery (12 ms) times. In addition, strong circular polarization sensitivity with an anisotropy ratio of 91.1% is observed in self-powered mode. Performance comparisons with reference devices confirm the advantages of the heterostructure. The improved behavior is attributed to the built-in electric field and carrier separation at the heterointerface. These findings highlight the suitability of TiS_2/SiNW systems for low-power optoelectronic applications.

Keywords: Photodetector; TiS_2 ; Silicon nanowires; Self-powered devices; Type-II heterojunction; Broadband detection; Polarization sensitivity

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