

AC-driven excitonic devices based on two-dimensional semiconductors



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Prof. Wei DU

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Hosted by: Prof. Shen LAI

Abstract

Layered two-dimensional semiconductor materials, e.g. transition metal dichalcogenides (TMDs), are widely studied for room-temperature excitonic devices due to their large exciton binding energy. Using excitons as the bridge to communicate the optical and electrical properties of two-dimensional semiconductors, electrically-driven excitonic light emission or transport devices have potential applications in future opto-electronic circuits. However, most of the current studies still focus on the low frequency operation. Exploring the interactions of electrons, excitons and photons in two-dimensional semiconductors under the alternating current (AC) electric field will provide new information for the design of high-frequency excitonic devices. In this talk, progresses in Prof. Du's group will be discussed regarding the AC-driven excitonic devices based on two-dimensional semiconductors.

Biography

Prof. Wei DU is currently a full professor at the Institute of Functional Nano & Soft Materials of Soochow University. She received her bachelor degree from Fudan University in 2012 and Ph.D. from National University of Singapore in 2017. From 2018 to 2021, she was engaged in postdoctoral research at Nanyang Technological University (NTU) in Singapore. In May 2021, she joined the Institute of Functional Nano and Soft Materials of Soochow University, and won the National Overseas High-level Talent Youth Program in the same year. Over the past years, she has been engaged in the research of electrically-driven plasmonic and excitonic devices towards applications in optoelectronic circuits. So far, she has published 19 papers as the first or corresponding author, including Nature Photonics (2), Nature Communications (1), Journal of the American Chemical Society (1), Nano Letters (3), Advanced Materials (1), Small (2) etc., and has been granted 5 patents.