

Exploring Moiré Excitons in Transition Metal Dichalcogenide and Complex Oxide Heterostructures

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Transition metal dichalcogenides (TMDs) have recently emerged as a promising platform for exploring novel moiré physics. So far, however, moiré excitons have only been observed and studied in semiconducting TMD heterostructures. In this work, we explore the unique properties of moiré excitons formed in heterostructures combining TMDs and complex oxides. By integrating these two material systems, we aim to exploit the multifunctional capabilities of moiré excitons and complex oxides. Utilizing photoluminescence and differential reflectance spectroscopy, we probe the signatures of moiré exciton emissions in these heterostructures. This research paves the way for potential applications in tunable moiré superlattices and optoelectronic devices, while also broadening the understanding of excitonic interactions in hybrid material systems.

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