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STRONG MID-INFRARED PHOTORESPONSE IN TWISTED BILAYER GRAPHENE

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Twisted bilayer graphene has recently been extensively investigated due to its unusual physical properties. In this talk, we will discuss its infrared optical properties and its potential in mid-infrared light detection. We first show that the folding of the Brillouin zone leads to enhanced density of states and strong mid-infrared light absorption, which are tunable by the twist angle. Furthermore, we reveal the significance of the formation of superlattice bandgap. Strong mid-infrared photoresponse is observed when the Fermi-level is within the superlattice bandgap. On the contrary, when the superlattice bandgap is vanished, the photoresponse is minimized. Our demonstration provides an alternative pathway towards the realization of high performance mid-infrared photodetectors.