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【506】Observation of flat bands in 57° twisted bilayer WSe_2

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Recent transport experiments revealed a correlated insulating phase and quantum criticality points in twisted transition metal dichalcogenides (TMDs) that were predicted to host non-dispersive Moiré mini-bands. Here, we report for the first time on the direct observation of flat bands in twisted TMDs investigating 57° twisted bilayer WSe_2 by micro-focused angle-resolved photoemission spectroscopy. We resolve multiple Moiré mini-bands with strongly reduced dispersion and significant mini-gaps. By comparison with effective continuum band structure models, we attribute the origin of the flat states to a moderate Moiré potential of ≈ 50 meV emerging from the stacking of the two semiconducting layers.

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