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**Tunable van Hove Singularities and Optical Absorption of Twisted Bilayer Graphene** YUFENG LIANG, LI YANG, Washington University in St. Louis — We perform the first-principles GW-Bethe-Salpeter Equation (BSE) simulation to study the optical absorption spectra of isolated twisted bilayer graphene (TBLG). The twisting generates new van Hove singularities (VHS), and these VHSs and corresponding optical absorption peaks can be tuned in a wide range by the twist angle. Enhanced electron-electron and electron-hole interactions are shown to be important to understand both optical absorption peak positions and their lineshapes. With these many-electron effects included, our calculation satisfactorily explains recent experimental measurements.

Yufeng Liang
Washington University in St. Louis

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