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The Plasmon Spectrum of Twisted Bilayer Graphene NICHOLAS WERNER, ANDREAS BILL, California State University, Long Beach — Twisted Bilayer Graphene (TBLG) is composed of two graphene sheets stacked with a relative twist angle between them. This system has many unusual properties as a consequence of its complex lattice structure. Notably, Cao and collaborators [Nature **556**, 43 (2018)] recently reported the discovery of a superconducting state in TBLG, exhibiting most strongly at a "magic angle" of about 1.05. There does not yet exist a consensus on the mechanism that causes this state. The band structure determined as a function of twist angle points towards the possible existence of low energy electronic collective modes (acoustic plasmons). We summarize the relevant features of the band structure and discuss how they may influence the plasmon spectrum. We present the plasmon spectrum for several twist angles near the magic angle and at varying chemical potentials. We discuss the possible connection between acoustic plasmons and the superconducting state.

Nicholas Werner
California State University, Long Beach

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