Kohn anomaly near the K point of bilayer graphene

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The dispersion of electrons and phonons near the K point of bilayer graphene was investigated from a resonant Raman study using different laser excitation energies in the visible and near infrared range. The electronic structure was analyzed within the tight-binding approximation, and the Slonczewski-Weiss-McClure (SWM) parameters were obtained from the analysis of the dispersive behavior of the Raman features. A discontinuous softening of the phonon branches (Kohn anomaly) was observed near the K point, and our results evidence the importance of considering electron-phonon and electron-electron interactions to correctly describe the phonon dispersion of graphene.