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Fermi velocity renormalization in misoriented graphene on hexagonal boron nitride[1] MAHESH NEUPANE, DARSHANA WICKRAMARATNE, SUPENG GE, GEN YIN, ROGER LAKE, Univ of California - Riverside — The electronic structure, Fermi velocity, and bandgap are calculated for graphene on BN as a function of misorientation angle. The Fermi velocity of Bernal stacked graphene on BN increases to 1.6 v_0 where v_0 is the velocity of single-layer graphene. For misorientation angles ranging from 5 to 27 degrees, the Fermi velocities of the Dirac electrons in graphene are relatively insensitive to the angle with values ranging between 0.85 and 0.9 v_0. In addition, the bandgap at the Dirac point for rotated graphene on BN decreases by an order of magnitude compared to that of perfectly registered graphene on h-BN. This suggests a reduction in the interlayer coupling between the graphene and BN layers due to the rotation. Calculations are performed using density functional theory.

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