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Vertical transport through a misoriented graphene / hexaonal boron-nitride / graphene heterostructure[1] SUPENG GE, DARSHANA WICKRAMARATNE, ROGER LAKE, Univ of California - Riverside, UNIVERSITY OF CALIFORNIA RIVERSIDE TEAM — Hexagonal boron nitride has an atomically smooth self-passivated surface and minimal lattice mismatch with graphene, which makes it an ideal substrate material for achieving high-mobility graphene devices. There is also a growing interest in tunneling devices fabricated by vertically stacking h-BN between two layers of graphene. Mechanical stacking of these individual layers leads to interfaces that are naturally misoriented with respect to each other. Furthermore, the number of layers of h-BN between the graphene layers in such devices can also vary. The combined effect of the twist angle and the thickness of the h-BN layer on the vertical transport properties is still an open question. Using ab-initio calculations we calculate transmission across unrotated and rotated graphene/h-BN/graphene heterostructures. For a single layer of BN, misorientation increases the tunneling transmission. The transmission as a function of h-BN layer thickness and different commensurate rotation angles is discussed.

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