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Novel Graphene Devices by Precision Transfer Method CORY DEAN, INANC MERIC, ANDREA YOUNG, CHANGGU LEE, NATALIA BAKLITSKAYA, PHILIP KIM, JIM HONE, KEN SHEPARD, Columbia University —
Hexagonal BN (h-BN) represents the insulator analogue of graphene, sharing identical crystal structure but with B and N atoms each comprising the two sublattices. Owing to its large bandgap, chemical inertness, hexagonal lattice structure (with only 2% lattice mismatch to graphene), planar (i.e. atomically flat) surface structure and good dielectric properties, single crystall h-BN represents a promising alternative to SiO2 as the supporting substrate in graphene FET devices. We discuss our investigation of graphene-BN hybrid devices, realized by precision transfer of mechanically exfoliated graphene and single crystal h-BN flakes. We compare device perfromance of graphene-over-BN with the more conventional graphene-over-SiO2 geometry, and also examine BN as an ultra-thin, crystalline, top-gate dielectric.

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