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Introducing lattice strain to graphene encapsulated in hBN HIKARI TOMORI, University of Tsukuba and PRESTO-JST, RINEKA HIRAIDE, YOUITI OOTUKA, University of Tsukuba, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Materials Science (NIMS), AKINOBU KANDA, University of Tsukuba — Due to the characteristic lattice structure, lattice strain in graphene produces an effective gauge field. Theories tell that by controlling spatial variation of lattice strain, one can tailor the electronic state and transport properties of graphene. For example, under uniaxial local strain, graphene exhibits a transport gap at low energies, which is attractive for a graphene application to field effect devices. Here, we develop a method for encapsulating a strained graphene film in hexagonal boron-nitride (hBN). It is known that the graphene carrier mobility is significantly improved by the encapsulation of graphene in hBN, which has never been applied to strained graphene. We encapsulate graphene in hBN using the van der Waals assembly method. Strain is induced by sandwiching a graphene film between patterned hBN sheets. Spatial variation of strain is confirmed with micro Raman spectroscopy. Transport measurement of encapsulated strained graphene is in progress.

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