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**Imaging and Manipulating Defects in Insulating Hexagonal Boron Nitride Using Scanning Tunneling Microscopy** DILLON WONG, JAIRO VELASCO, LONG JU, JUWON LEE, SALMAN KAHN, HSINZON TSAI, CHAD GERMANY, University of California, Berkeley, TAKASHI TANIGUCHI, KENJI WATANABE, National Institute for Material Science, ALEX ZETTL, FENG WANG, MICHAEL CROMMIE, University of California, Berkeley — Scanning tunneling microscopy (STM) has a long history of visualizing individual defects in conductors and semiconductors, but such studies were previously not possible for intrinsic bulk insulators (due to lack of electrical continuity). Here we report STM imaging and control of point defects in a bulk insulator. This is accomplished by exploiting graphene's atomically thin nature to peer into defect phenomena that occur in an underlying bulk crystal of hexagonal boron nitride (BN). Using scanning tunneling spectroscopy (STS) in combination with a graphene/BN gated device, we obtain information on a variety of different localized BN defect structures. We also demonstrate the ability to manipulate these observed defects. The methods and analysis described here may also be used to investigate other defect/insulator systems.

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