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Local Spectroscopy of the Electrically Tunable Band Gap in Trilayer Graphene MATTHEW YANKOWITZ, University of Arizona, FENGLIN WANG, CHUN NING LAU, University of California, Riverside, BRIAN LEROY, University of Arizona — Trilayer graphene exhibits two natural stacking orders (Bernal and rhombohedral), and the electronic properties differ substantially between the two. While Bernal-stacked trilayer graphene is a semimetal with an electrically tunable band overlap, rhombohedrally stacked trilayer graphene has an electrically tunable band gap. We have performed low-temperature ultra-high vacuum STM measurements of both stacking orders. In Bernal-stacked trilayer graphene, we observe metallic behavior for all energies and electric fields probed. In rhombohedrally stacked trilayer graphene, we measure an electric field tunable band gap whose magnitude is well described by theoretical predictions. Furthermore, we explore the microscopic nature of the band gap by probing spatial variations throughout the sample.

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