

Abstract Submitted  
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**Mapping the Dirac point in gated bilayer graphene** APARNA DESHPANDE, University of Arizona, WENZHONG BAO, ZENG ZHAO, CHUN NING LAU, University of California Riverside, BRIAN LEROY — Bilayer graphene is a unique zero band gap semiconductor where the band gap can be tuned by applying an electric field or by chemical doping. We have carried out scanning tunneling microscopy and spectroscopy measurements on exfoliated bilayer graphene on SiO<sub>2</sub> at 4.5 K. Imaging shows the characteristic triangular lattice for the bilayer and modulations due to the SiO<sub>2</sub> substrate. Using a back gate, an electric field is applied perpendicular to the plane of the bilayer. Tunneling spectroscopy measurements reveal the band gap changing due to the electric field. Also, we observe a linear shift of the Dirac point with gate voltage as expected for a bilayer with a quadratic dispersion relation. Based on the variation of the band gap and shift of the Dirac point, we have estimated the effective mass of the charge carriers in the bilayer to be  $0.023m_e$ . Our investigation demonstrates the ease of band gap tunability which gives bilayer graphene an edge over monolayer graphene for device applications.

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