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Charge transport in dual-gated bilayer-graphene Corbino-disk[1]
JUN YAN, MICHAEL FUHRER, Center for Nanophysics and Advanced Materials, University of Maryland, College Park, MD 20742-4111, USA — We use the Corbino-disk geometry to study the electron transport behavior of dual-gated bilayer graphene devices. Experimental exclusion of the edge states enables us to probe the bulk of bilayer graphene and its electronic properties. The temperature dependence of the maximum resistivity is found to be well described by simple thermal activation at high temperatures and variable range hopping at low temperatures, consistent with other transport studies. The electric-field-dependent band gap extracted from thermal activation is found to be in good agreement with infrared spectroscopic studies (Zhang et al. Nature 459, 820 (2009)). The similarity of our data to those of conventional dual-gated bilayer graphene devices with edges suggests that edges do not play a significant role in such devices at least for temperatures above 5 K, and points to the importance of reducing bulk disorder for improving device performance.

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