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In-plane magnetotransport in gapped bilayer graphene MATTHIAS STUDER, University of British Columbia, Canada, SIFANG CHEN, JOSHUA FOLK, University of British Columbia — The tunability of the band gap in bilayer graphene using a perpendicular electric field makes this material a promising candidate for future carbon electronics.[1] Recent studies show that the residual conductivity at low temperature in the gapped state with zero total carrier density is a result of hopping transport.[2] We have studied the transport in this regime as a function of an in-plane magnetic field. We find a strikingly strong positive magnetoresistance that leads to a increase of the resistance by an order of magnitude at 10 Teslas in-plane magnetic field compared to the value at 0 T. The temperature dependence of the resistance is well described by variable range hopping transport for all magnetic field values, and suggests that the hopping range is strongly dependent on the in-plane magnetic field.

[1]J. B. Oostinga et al., *Nat. Mat.*, **7**, 151 (2007) Y. Zhang et al., *Nature*, **459**, 820 (2009)
[2]T. Taychatanapat and P. Jarillo-Herrero, *Phys. Rev. Lett.*, **105**, 166601, (2010)

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