

Abstract Submitted  
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**Competition between Long-Range and Short-Range Scattering in Bilayer Graphene** LAIN-JONG LI, WENJING ZHANG, Nanyang Technological University — We introduce positively charged impurities to a BLG transistor with dimethylformamide vapor soaking, where it becomes stably n-doped after electrical annealing. Subsequent exposure to moisture results in positive shift of Dirac point and the increase in electron and hole mobility, suggestive of weakened long-range Coulomb scattering. Once these charged impurities are screened to a low concentration, the electron mobility starts to decrease but hole mobility increases, indicating that short-range scatters are positively charged in nature and therefore first affect the n-channel. Further exposure to moisture leads to the decrease in hole but increase in electron mobility, suggesting that negatively charged short-range scatters govern the p-channel. The asymmetric behaviors for p- and n-conductance is likely related to the competition between long- and short-range scatters, where the short-range scatters are suggested to be resulted from the interaction between BLG and moisture (H<sup>+</sup> and OH<sup>-</sup> adsorbates).

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