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Weak Localization in few layer Black Phosphorus NATHANIEL GILLGREN, YANMENG SHI, TIMOTHY ESPIRITU, University of California Riverside, KENJI WATANABE, TAKAHASHI TANIGUCHI, National Institute for Materials Science, CHUN NING (JEANIE) LAU, University of California Riverside — Few-layer black phosphorus has recently attracted interest from the scientific community due to its high mobility, tunable band gap, and large anisotropy. Recent experiments have demonstrated that black phosphorus provides a promising candidate to explore the physics of 2D semiconductors. In this study we explore the magnetotransport of few-layer black phosphorus-boron nitride hetereostructure devices at low magnetic fields. Weak localization is observed at low temperatures. We extract the dephasing length and measure its dependence on temperature, carrier density and electric field.

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