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Towards tunable black phosphorus field-effect transistors

ZUOCHENG ZHANG, LIKAI LI, Fudan University, JASON HORNG, University of California at Berkeley, NAIZHOU WANG, University of Science and Technology of China, FANGYUAN YANG, YU ZHANG, YIJUN YU, GUORUI CHEN, Fudan University, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Materials Science, XIANHUI CHEN, University of Science and Technology of China, FENG WANG, University of California at Berkeley, YUANBO ZHANG, Fudan University — Black phosphorus stands out as a promising two-dimensional material for potential nano-electronic and opto-electronic applications. In this talk we present the fabrication of black phosphorus field-effect transistors on various substrates. The devices are fabricated using the dry-transfer method with polypropylene carbide (PPC) thin films in an inert atmosphere. Tunable ambipolar behavior is observed by varying the substrate. The excellent transistor performance may lead to novel device applications based on black phosphorus thin crystals.

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