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The novel properties of epitaxial bismuth ultra-thin films on superconducting substrate NbSe₂ DANDAN GUAN, HAOHUA SUN, MEIXIAO WANG, GUANYONG WANG, DAN XU, Shanghai Jiao Tong Univ, XIAOJUN YANG, ZHU-AN XU, Zhejiang University, YAOYI LI, CANHUA LIU, DONG QIAN, JIN-FENG JIA, Shanghai Jiao Tong Univ, SHANGHAI JIAO TONG UNIVERSITY TEAM, ZHEJIANG UNIVERSITY COLLABORATION, COLLABORATIVE INNOVATION CENTER OF ADVANCED MICROSTRUCTURE COLLABORATION — Bismuth is theoretically predicted to be a quantum spin Hall (QSH) system. Such a QSH system, interesting itself with the genuine spin degenerated backscattering forbidden transport property, is also a potential platform to study the 2D topological superconductor with superconductivity induced by proximity effect. The epitaxial growth of ultra-thin Bi(111) film on superconductor NbSe₂ was investigated by scanning tunneling microscopy (STM) and scanning tunneling spectroscopy (STS). The orientation transition from Bi(110) phase to Bi(111) phase has been observed. One-dimensional topological edge states on the zig-zag edge of Bi(111) bilayers and proximity effect-induced superconductivity were also revealed by STS analysis.

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