

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Two-dimensional superconductivity realized in an MBE-grown Bi₂Te₃/FeTe heterostructure¹ QING LIN HE, HONGCHAO LIU, MINGQUAN HE, YING HOI LAI, Department of Physics, the Hong Kong University of Science and Technology, HONGTAO HE, GAN WANG, Department of Physics, South University of Science and Technology of China, KAM TUEN LAW, ROLF LORTZ, JIANNONG WANG, IAM KEONG SOU, Department of Physics, the Hong Kong University of Science and Technology — We report a superconductivity realized at the interface of a Bi₂Te₃/FeTe heterostructure fabricated via van der Waals epitaxy using the molecular beam epitaxy technique, which appears even when the thickness of Bi₂Te₃ is as thin as one quintuple layer. The two-dimensional nature of the observed superconductivity with the highest transition temperature around 12 K was verified by the existence of a Berezinsky-Kosterlitz-Thouless transition and the diverging ratio of in-plane to out-plane upper critical field on approaching the superconducting transition temperature. The underlying mechanism of this interfacial superconductivity will be discussed. The heterostructure studied in this work provides an ideal platform with unconventional superconductivity for hosting Majorana fermions and studying their exotic physics.

¹The work described here was substantially supported by grants from the Research Grants Council of the Hong Kong Special Administrative Region, China (project No. 604910, 605011, AOE/P-04/08-3, 605512 and 603010).

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Date submitted: 06 Nov 2013

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