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Highly anisotropic Dirac fermions in a Bi square net of SrMnBi₂ JUN SUNG KIM, JOONBUM PARK, Department of Physics, Pohang University of Science and Technology, GEUNSIK LEE, Department of Chemistry, Pohang University of Science and Technology, FREDERIK WOLFF-FABRIS, Dresden High Magnetic Field Laboratory, Helmholtz-Zentrum Dresden-Rossendorf, YOON YOUNG KOH, Institute of Physics and Applied Physics, Yonsei University, MAN JIN EOM, Department of Physics, Pohang University of Science and Technology, YEONGKWAN KIM, Institute of Physics and Applied Physics, Yonsei University, M.A. FARHAN, Department of Chemistry, Pohang University of Science and Technology, YOUNJUNG JO, Department of Physics, Kyungpook National University, CHANGYOUNG KIM, Institute of Physics and Applied Physics, Yonsei University, Seoul 120-749, Korea, JI HOON SHIM, Department of Chemistry, Pohang University of Science and Technology, Pohang 790-784, Korea — We report the highly anisotropic Dirac fermions in a Bi square net of SrMnBi₂, based on a first principle calculation, angle resolved photoemission spectroscopy, and quantum oscillations for high-quality single crystals. We found that the Dirac dispersion is generally induced in the (SrBi)⁺ layer containing a double-sized Bi square net. In contrast to the commonly observed isotropic Dirac cone, the Dirac cone in SrMnBi₂ is highly anisotropic with a large momentum-dependent disparity of Fermi velocities of ~ 8 . These findings demonstrate that a Bi square net, a common building block of various layered pnictides, provide a new platform that hosts Jun Sung Kim highly anisotropic Dirac fermions. Department of Physics, Pohang University of Science and Technology

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