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Electronic structure origins of the extremely large magnetoresistance in tungsten ditelluride IVO PLETIKOSIC, MAZHAR ALI, ROBERT CAVA, Princeton Univ, TONICA VALLA, Brookhaven Natl Lab — WTe_2 is a layered transition metal dichalcogenide showing a structural reduction to one-dimensional tellurium-surrounded tungsten chains. The material exhibits an extremely large positive anisotropic magnetoresistance of a few million percent that increases as the square of the field and shows no saturation up to 60 T. We explored the possible electronic structure origins of the magnetoresistance by means of angle-resolved photoelectron spectroscopy (ARPES) and found electron and hole pockets of equal size along the direction of tungsten chains, forming a highly anisotropic quasi-twodimensional Fermi surface. The perfect carrier compensation at low temperatures has been identified as the primary source of the magnetoresistive effect, and the change of the Fermi surface shape as well as a high-density-of-states band slightly below the Fermi level recognized as the cause of its diminishing at rising temperatures. [1] M.N. Ali et al. Nature 514, 205 (2014) [2] I. Pletikosi? et al. arXiv:1407.3576 (2014)

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