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Surface Fermi arc connectivity in the type-II Weyl semimetal candidate WTe_2 ¹ OLIVER RADER, JAIME SÁNCHEZ-BARRIGA, Helmholtz-Zentrum Berlin, MAIA G. VERGNIORY, Donostia International Physics Center, DANIIL EVTUSHINSKY, Helmholtz-Zentrum Berlin, IRENE AGUILERA, Forschungszentrum Jülich and JARA, ANDREI VARYKHALOV, Helmholtz-Zentrum Berlin, STEFAN BLÜGEL, Forschungszentrum Jlich and JARA — We perform ultrahigh-resolution angle-resolved photoemission experiments at a temperature $T = 0.8$ K on the type-II Weyl semimetal candidate WTe_2 . We find a surface Fermi arc connecting the bulk electron and hole pockets on the (001) surface. Our results show that the surface Fermi arc connectivity to the bulk bands is strongly mediated by distinct surface resonances dispersing near the border of the surface-projected bulk band gap. By comparing the experimental results to first-principles calculations, we argue that the coupling to these surface resonances, which are topologically trivial, is compatible with the classification of WTe_2 as a type-II Weyl semimetal hosting topological Fermi arcs. We further support our conclusion by a systematic characterization of the bulk and surface character of the different bands and discuss the similarity of our findings to the case of topological insulators.

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