

Abstract Submitted
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Tunability of the topological nodal-line semimetal phase in ZrSiX-type materials¹ MD MOFAZZEL HOSEN, KLAUSS DIMITRI, Univ of Central Florida, ILYA BELOPOLSKI, Princeton University, PABLO MALDONADO, Uppsala University, RAMAN SANKAR, Academia Sinica, NAGENDRA DHAKAL, GYANENDRA DHAKAL, TAIASON COLE, Univ of Central Florida, PETER M. OPPENEER, Academia Sinica, DARIUSZ KACZOROWSKI, Polish Academy of Sciences, FANGCHENG CHOU, National Taiwan University, M. ZAHID HASAN, Princeton University, TOMASZ DURAKIEWICZ, Los Alamos National Laboratory, MADHAB NEUPANE, National Taiwan University — The discovery of a topological nodal-line (TNL) semimetal phase in ZrSiS has invigorated the study of other members of this family. Here, we use angle-resolved photoemission spectroscopy (ARPES) to study the comparative electronic structure of ZrSiX (where X = S, Se, Te) materials. Our experimental data and first-principles calculations, for the first time, reveal the tunability of topological nodal-line fermion phase in ZrSiX materials by changing the spin-orbit coupling strength via X-anion. Our findings establish a new material system with an SOC tunable nodal-line phase.

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