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Ultrafast Bulk and Surface Dynamics of Bi2Se3 Measured by Time-Resolved ARPES JONATHAN SOBOTA, SHUO-LONG YANG, JAMES ANALYTIS, YULIN CHEN, Stanford University, IAN FISHER, Stanford Unversity, PATRICK KIRCHMANN, Fritz Haber Institute of the Max Planck Society, ZHI-XUN SHEN, Stanford University — We investigated the nonequilibrium carrier dynamics of the topological insulator Bi_2Se_3 using femtosecond time- and angle- resolved photoemission spectroscopy. Optical excitation leads to a metastable population of bulk carriers due to the presence of the bandgap. We discuss the coupling of these carriers to the Dirac surface state, which results in a long-lived nonequiilibrium surface carrier distribution. We will comment on the implications for topological insulator device applications.

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