Abstract Submitted
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Unusual Fraunhofer spectroscopy of superconductor-topological insulator-superconductor junctions[1] ANGELA CHEN, MOON JIP PARK, GREGORY MACDOUGALL, MATTHEW GILBERT, NADYA MASON, Univ of Illinois - Urbana — Three dimensional topological insulators are characterized by their conducting surface states, where electrons are spin momentum locked on the surfaces. Coupling the surface states of a topological insulator to an s-wave superconductor is expected to yield unconventional superconductivity. To better understand how supercurrents are carried on the surface states of a topological insulator, we perform Fraunhofer spectroscopy measurements on proximity-coupled Bi2Se3. In a junction with a conventional superconductor, the interference of uniformly distributed supercurrents would result in a standard single-slit Fraunhofer pattern. However, we find that by applying additional external magnetic fields, we can strongly modulate a standard Fraunhofer pattern into an interference pattern with unusual features. This may be an indication of spin momentum locked surface states in Bi2Se3.

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