

Abstract Submitted
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LT-STM study of the topological insulator Bi_2Se_3 with superconducting and/or magnetic over layers RAMI DANA, ANITA ROYCHOWDHURY, University of Maryland, IREK MIOTKOWSKI, YONG P. CHEN, Purdue University, MICHAEL DREYER, University of Maryland — Superconducting and/or magnetic over layers structures on topological insulator (TI) surfaces were suggested as a potential candidate to create Majorana bound states and 1D Majorana fermions (spin $1/2$, particle = antiparticle). The latter can serve as a platform for topological quantum computation since two Majorana bound states equal one fermion bound state and two degenerate states (full/empty) forming one qubit. In this work we study the TI Bi_2Se_3 using a low temperature STM. The data shows the signature energy gap $\Delta \sim 0.3$ eV, metallic surface states and typical defects. Following the experimental challenges to create and detect Majorana bound or chiral edge states, we present our study of Nb and/or Fe films on the Bi_2Se_3 surface.

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