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Appearance and suppression of electron interference patterns on the surface of $Ho_{0.05}Bi_{1.95}Se_3$ HYEOKSHIN KWON, WONHEE KO, INSU JEON, HYO WON KIM, JIYEON KU, YOUNGTEK OH, Samsung Advanced Institute of Technology, PAUL SYERS, JOHNPIERRE PAGLIONE, University of Maryland, College Park, SUNG WOO HWANG, HWANSOO SUH, Samsung Advanced Institute of Technology — We present study on the surface property of a magnetically doped topological insulator, $Ho_{0.05}Bi_{1.95}Se_3$. By using scanning tunneling microscopy (STM) and spectroscopy (STS), we obtained topographic images with several distinct types of defects, some of which originate from Holmium dopant atoms and conductance maps at various bias voltages. It is found that conductance maps in the upper and lower branches of helical Dirac cone show interference patterns around the defects. Interestingly, the interference patterns were substantially suppressed in the range of 40 meV close to the Dirac point. Our analysis shows that the surface states of $Ho_{0.05}Bi_{1.95}Se_3$ behave differently than other magnetically doped topological insulators.

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