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Reflection from surface step defect in topological insulator nanofilm THAKSHILA M. HERATH, Department of Physics and Astronomy, Georgia State University, Atlanta, GA 30303, USA, PRABATH HEWAGEEGANA, Department of Physics, University of Kelaniya, Kelaniya 11600, Sri Lanka, VADIM M. APALKOV, Department of Physics and Astronomy, Georgia State University, Atlanta, GA 30303, USA — Ultrathin topological insulator nanofilm with a step-like defect, which divides two regions of nanofilm with different thicknesses, is considered. Electron, propagating along the nanofilm surface, is reflected from the step. We calculate the reflectance of such electron for different parameters of the nanofilm and different parameters of the defect. We demonstrate that such system has an interesting property. Namely, the incident electron wave not only produces the reflected and transmitted waves, but also generates the mode, localized at the step-like defect. Such mode results in an enhancement of the electron density at the defect by $\sim$20%. The strength of such enhancement depends on the parameters of the nanofilm and the height of the step.

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