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Mott Physics at the Boundaries of Topological Insulators[1] AMAL MEDHI, PRAMOD KUMAR VERMA, VIJAY SHENOY, H. R. KRISHNAMURTHY, Indian Institute of Science, Bangalore — We address how the nature of linearly dispersing edge states of a topological insulating solid evolves with increasing electron-electron correlation engendered by a Hubbard like on-site repulsion. We report studies on strips (2D) and slabs (3D) of varying widths and thicknesses of topological insulators described by model Hamiltonians using an inhomogeneous slave rotor mean-field theory. Motivated by these studies, we construct variational wavefunctions with approriate Gutzwiller-Jastrow correlations and study them using the Monte-Carlo method. These studies reveal the width/thickness dependence of the critical on-site repulsion that obtains an edge Mott insulating state, and uncover the mechanism of the Mott transition in such systems.

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