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Study of correlated topological insulators in one dimension<sup>1</sup> TSUNEYA YOSHIDA, ROBERT PETERS, SATOSHI FUJIMOTO, NORIO KAWAKAMI, Department of Physics, Kyoto University — In correlated topological insulators, various exotic phenomena are expected. For instance, realization of an exotic Mott insulator where one can observe gapless edge modes in the spinon excitation instead of the single particle excitation is proposed. Unfortunately, however, this exotic behavior has not been well established so far. In this article, we explore possibilities of this behavior and find the aforementioned edge behavior in one dimensional systems, which can be understood with symmetry reduction under the Shiba transformation. Furthermore, we also propose a topological Mott transition which is a new type of topological phase transition and never observed in free fermion systems. This unconventional transition occurs in spin liquid phases and is accompanied by zeros of the single particle Green's function and gap closing in the spin excitation spectrum.

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