

Abstract Submitted  
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**Topology transfer from interacting systems to free lattice fermions**<sup>1</sup> RUI LI, Univ. of Kaiserslautern, DOMINIK LINZNER, Univ. of Darmstadt, MICHAEL FLEISCHHAUER, Univ. of Kaiserslautern — We show that the topological properties of an interacting, one-dimensional lattice system can be transferred to non-interacting lattice fermions by proximity coupling. A cyclic variation of parameters in the interacting system, corresponding to a topological Thouless pump, is shown to result in a quantized fractional charge transport of the free fermions. We argue that this transfer of topological properties can be used to detect topological invariants of interacting systems with the potential advantage of being insensitive to topological excitations, which limit interferometric schemes [1]. We discuss in particular the extended superlattice Bose-Hubbard model (SLBHM) in one spatial dimension at quarter filling which has a degenerate ground state and fractional topological phases. Proximity coupling to a one-dimensional lattice of non interacting fermions leads to the formation of an incompressible phase of the fermions at quarter filling. Performing a Thouless pump in the SLBH system would result in a quantized charge transport in the fermionic system. We analyze the robustness of the induced charge pump and argue that it allows to detect the fractional Chern number associated with the SLBHM even in the presence of defects. [1] F. Grusdt et. al. Nature Comm. 7, 11994 (2016)

<sup>1</sup>SFB TRR 185

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