Detection of topological invariants in driven-dissipative and interacting systems[1] DOMINIK LINZNER, RUI LI, MICHAEL FLEISCHHAUER, Department of Physics and Research Center OPTIMAS, University of Kaiserslautern — We propose a conceptual detection scheme of topological invariants for thermal and driven, dissipative gaussian systems. In closed systems topological order can be measured by means of quantized transport which coincides with a quantized winding of the polarization. This connection breaks down for mixed states, e.g. in the presence of a finite temperature. While in previous work [1] we have identified that the winding of the polarization is still quantized in open systems and can therefore be used to classify topological order, the same no longer holds true for transport properties. We show for the case of one-dimensional systems that an auxiliary system at $T \approx 0$ coupled to the finite-temperature or driven system can inherit its topological properties. Thus a non-trivial winding of the polarization in the open system leads to a quantized particle transport in the auxiliary system. We also show for the example of the 1D extended superlattice Bose-Hubbard model that the transfer of topological properties also holds for interacting systems. This allows us to detect topological order in driven-dissipative as well as interacting systems. [1] D. Linzner, L. Wawer, F. Grusdt and M. Fleischhauer, Phys. Rev. B 94, 201105(R) (2016)

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