

# Trivial Andreev band mimicking topological bulk gap reopening in the nonlocal conductance of long Rashba nanowires

Richard Hess

Henry F. Legg, Daniel Loss, and Jelena Klinovaja

Department of Physics, University of Basel, Klingelbergstrasse 82, CH-4056 Basel, Switzerland

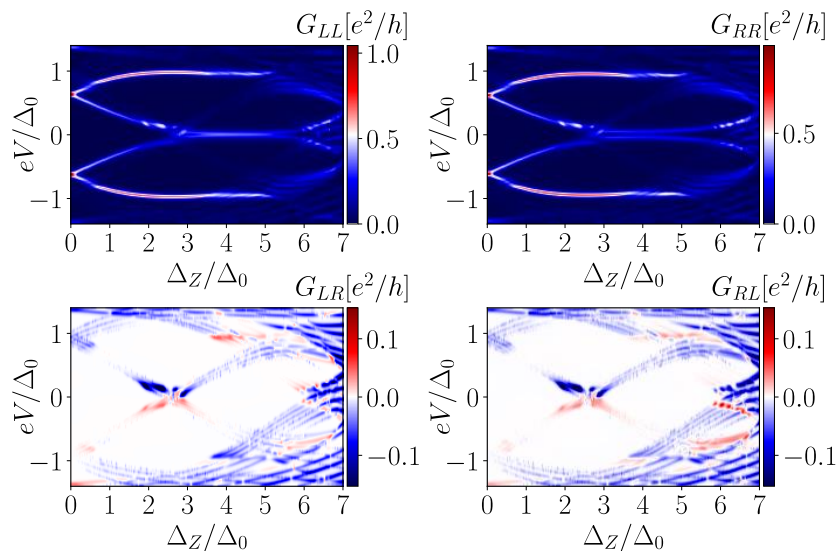
[richardgerhard.hess@unibas.ch](mailto:richardgerhard.hess@unibas.ch)

We consider a one-dimensional Rashba nanowire in which multiple Andreev bound states [1,2,3] in the bulk of the nanowire form an Andreev band. We show that, under certain circumstances, this trivial Andreev band can produce an apparent closing and reopening signature of the bulk band gap in the non-local conductance of the nanowire. Furthermore, we show that the existence of the trivial bulk reopening signature (BRS) in non-local conductance is essentially unaffected by the additional presence of trivial zero-bias peaks (ZBPs) in the local conductance at either end of the nanowire, see Fig. 1. The simultaneous occurrence of a trivial BRS and ZBPs mimics the basic features required to pass the so-called 'topological gap protocol' [4,5]. Our results therefore provide a topologically trivial minimal model by which the applicability of this protocol can be benchmarked.

## References

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- [3] E. Prada et al., Nat. Rev. Phys. 2, 575 (2020)
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- [5] M. Aghaee et al., arXiv:2207.02472 (2022)

## Figures



**Figure 1:** Local and non-local conductance of a system hosting an Andreev band and trivial zero-energy states as a function of the Zeeman field strength. Figure taken from Hess et al., [arXiv:2210.03507v2](https://arxiv.org/abs/2210.03507v2) (2022)