Z. Zhang, L. Feng, S. Luo, Magic states cannot be broadcast

Referee report

The aim of the paper is to show that, restricted to prime dimensions, magic states cannot be broadcast by means of a stabilizer broadcasting channel. In fact, a trade-off relation is proved in terms of the robustness of magic resource measure (ROM), showing that the overall resource in the broadcast states cannot exceed the magic resource in the original state.

Overall evaluation

No cloning and no broadcasting results are one of the fundamental no-go theorems in quantum information theory and the present paper adds an important part to the picture. The paper is rather well written and in fact nice to read. The proofs are based on the properties of the Heisenberg-Weyl group in prime dimensions and of the ROM resource. I only have very few small remarks listed below.

Some specific comments

- p. 4, column 1, line 1: tr_b should be tr_a

- p. 4, column 1, line 5 from below: S should be $\mathcal{S}$ (calligraphic)

- The authors list a couple of further interesting open questions, but a natural question is whether Proposition 3 would hold if τ^b is also a magic state.