Erratum

Erratum to: Faithful Squashed Entanglement

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In the above paper Section D, "Proof of the Theorem", there is an error in the argument for going from one-way LOCC measurements to general LOCC measurements. We would like to thank Ke (Karl) Li and Andreas Winter for kindly pointing this out to us. In the following, we will explain this error and how it affects the claims of the paper.

The error lies in the assumption that in order to consider the distinguishability of an entangled state $\rho_{A:B}$ with respect to separable states under LOCC measurements, it suffices to consider the distinguishability of $\rho_{A:B} \otimes |0\rangle\langle 0|_{A'} \otimes |0\rangle\langle 0|_{B'}$ with respect to separable states under LOCC measurements comprised solely of projective measurements, for appropriate local ancilla states $|0\rangle_{A'} \otimes |0\rangle_{B'}$. However this is incorrect, since one would need to make sure that the separable states are of the form $|0\rangle\langle 0|_{A'} \otimes |0\rangle\langle 0|_{B'}$ in the ancilla registers. This, however, is not true in general.

In view of this, the theorem of the paper should be revised to the following:

Theorem. *For every tripartite finite-dimensional state ρ_{ABE},*

$$I(A; B|E)_\rho \geq \frac{1}{8 \ln 2} \left\| \rho_{AB} - \mathcal{S}_{A:B} \right\|^2_{\mathsf{LOCC}\rightarrow}. \tag{1}$$

That is, the lower bound on the conditional mutual information is given in terms of the *one-way* LOCC norm instead of the LOCC norm with unrestricted rounds of classical communication, as it was originally claimed. Note that due to the symmetry of the conditional mutual information, the communication can be taken either from Alice to Bob ($\mathsf{LOCC}\rightarrow$) or from Bob to Alice ($\mathsf{LOCC}\leftarrow$).

The corollaries should also be modified accordingly. In Corollaries 1, 2, 3, and 5 one must replace the LOCC norm by the one-way LOCC norm, while in Corollary 4 one must replace the classes $\mathsf{QMA}_{\mathsf{LOCC}}(k)$ by $\mathsf{QMA}_{\mathsf{LOCC}\rightarrow}(k)$. The proofs of the corollaries

are unaffected by these modifications, as they are solely based on the main inequality of the theorem.

We emphasize that the main conclusion of the paper, the fact that squashed entanglement is faithful, is not affected by the above modifications.

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