Erratum: Nonlocal and quantum advantages in network coding for multiple access channels [Phys. Rev. A 113, 042624 (2026)]

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In our paper, we investigated classical multiple-access channels (MACs) in which multiple senders may cooperate in their encoding using different classes of shared resources, including local, quantum, and nonsignaling resources. In particular, we characterized the sum capacity of a class of MACs constructed from pseudotelepathy games and showed that quantum and nonsignaling resources can provide advantages over local resources.

Recently, Yao and Jafar [1] characterized the capacity region of a K-sender discrete memoryless MAC with nonsignaling assistance and studied the extremal multiplicative gain in the sum capacity provided by nonsignaling resources. In comparing their result with ours, they pointed out that the numerical values of the nonsignaling sum capacity $C_s^{(\mathrm{NS})}$ reported in Table II of our paper appear to be inconsistent with this bound.

We have revisited the calculation and found that the numerical values of $C_s^{(\mathrm{NS})}$ in Table II were incorrectly evaluated. We thank the authors of Ref. [1] for pointing out this discrepancy. According to Theorem 2, for the CHSH-game based MAC with parameters

$$(\eta_w, \eta_l) = (\eta, 1-\eta), \tag{1}$$

the nonsignaling sum capacity is

$$C_s^{(\mathrm{NS})} = 2 - h(\eta), \tag{2}$$

where $h(\eta)$ is defined in Eq. (21) of the original paper.

The corrected Table II is presented here.

TABLE II. The sum capacity is computed for a MAC with parameters $(\eta_w, \eta_l) = (\eta, 1-\eta)$ in Sec. V B. For $0.5 < \eta \leqslant 1$, the nonsignaling sum capacity is higher than the local one. For $0.50 < \eta \lesssim 0.87$, quantum resources lead to a higher capacity since a lower bound $\mathcal{L}_s^{(Q)}$ in Eq. (37) to the quantum sum capacity is strictly larger than the local one; hence we have $\mathcal{L}_s^{(Q)} > C_s^{(L)}$, for $0.50 < \eta \lesssim 0.87$, demonstrating a quantum advantage.

η	$C_s^{(L)}$	$\mathcal{L}_s^{(Q)}$	$C_s^{(NS)}$
0.50	0.451	0.451	0.451
0.60	0.557	0.583	0.643
0.70	0.698	0.734	0.874
0.80	0.880	0.905	1.152
0.87	1.038	1.039	1.384
0.90	1.116	1.116	1.497
1.00	1.482	1.482	2.00

The corresponding Fig. 3 was generated using the correct expression and therefore remains unchanged. This correction does not affect Theorem 2 or the main conclusions of the paper.

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[1] Y. Yao and S. A. Jafar, The capacity region of the multiple access channel with non-signaling assistance, arXiv:2608.13860.

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