

Monogamies of correlations and amplification of randomness

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Author(s):

R. Augusiak, M. Demianowicz, M. Pawłowski, J. Tura, A. Acín

Reference:

arXiv:1307.6390 [quant-ph]

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<http://arxiv.org/abs/1307.6390> [2]

Physical principles constrain the way nonlocal correlations can be distributed among parties in a Bell experiment. Here, we show that in any no-signalling theory the amount of violation of a certain class of Bell inequalities tightly bounds the knowledge that an external observer can gain about outcomes of any single measurement performed by the parties. Analogous relations are then proved for quantum correlations in the simplest scenario of three parties performing two dichotomic measurements. Later, we relate these monogamy trade-offs to the generation and amplification of randomness, in the latter case, in particular, reproducing and generalizing the results of [R. Colbeck and R. Renner, Nature Phys. 8, 450 (2012)]. Finally, we show that with the aid of the chained Bell inequalities one can amplify the epsilon-sources for $\epsilon < 1/6$, improving the existing results.

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