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【527】 Macroscopically nonlocal quantum correlations

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It is usually believed that coarse-graining of quantum correlations leads to classical correlations in the macroscopic limit. Such a principle, known as macroscopic locality, has been proved for correlations arising from independent and identically distributed (IID) entangled pairs. In this work we consider the generic (non-IID) scenario. We find that the Hilbert space structure of quantum theory can be preserved in the macroscopic limit. This leads directly to a Bell violation for coarse-grained collective measurements, thus breaking the principle of macroscopic locality.

Primary authors: DAKIĆ, Borivoje (University of Vienna); GALLEGO, Miguel (University of Vienna)

Presenter: GALLEGO, Miguel (University of Vienna)

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