

**Title: Minimal Multipartite Entanglement Detection**

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Entanglement is distinguished feature of quantum theory. Usually it is not easy to be identified, both theoretically and experimentally. With Koji Maruyama we show a method how to construct quadratic entanglement criteria. We start with a set of operators (Pauli matrix tensor products), for which we draw anticommutativity graphs. The sum of their squared mean values is bounded by the independence number of such a graph. The same procedure is performed for all possible divisions into subsystems by introducing cut-anticommutativity. This method is then applied in an experiment (in progress) by Christian Schwemmer, Lukas Knips and Harald Weinfurter, in which, by only two measurements we demonstrate multipartite entanglement of four-qubit Cluster and GHZ states