

## Lecture: Characterizing Quantum Correlations with Randomized Measurements

*Wednesday, 30 June 2021 09:00 (1h 30m)*

If only limited control over a multiparticle quantum system is available, a viable method to characterize correlations is to perform random measurements and consider the moments of the resulting probability distribution. We present systematic methods to analyze the different forms of entanglement with these moments in an optimized manner. First, we find the optimal criteria for different forms of multiparticle entanglement in three-qubit systems using the second moments of randomized measurements. Second, for higher-dimensional two-particle systems and higher moments, we provide criteria that are able to characterize various examples of bound entangled states, showing that detection of such states is possible in this framework. Finally, we analyze the resources needed for a statistically significant test

References:

S. Imai, N Wyderka, A. Ketterer, O. Gühne, Phys. Rev. Lett. 126, 150501 (2021)

A. Ketterer, S. Imai, N. Wyderka, O. Gühne, arXiv:2012.12176

### **Affiliation**

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**Presenter:** GÜHNE, Ottfried (Siegen University)

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