

Seminar Announcement

Speaker: Sibasish Ghosh

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Date: 2nd March, 2018

Time: 2:00pm - 3:00pm

Venue: Indian Statistical Institute, 110 Nelson Manickam Road, Aminjikarai, Chennai.

Title: Witnessing arbitrary bipartite entanglement in a measurement-device-independent way

Abstract: Experimental detection of entanglement of an arbitrary state of a given bipartite quantum system is crucial for exploring many areas of quantum information, and even to judge the quality of the entanglement-producing source. Unfortunately, in a realistic scenario, neither we can completely certify the source which produces the entangled state nor can we rely completely on the measuring devices (required for detecting entanglement), usually supplied by a third party. In order to overcome this challenge, we combine here the ideas of Branciard et al.'s measurement device independent entanglement witness protocol [Phys. Rev. Lett. vol. 110, pp. 060405 (2013)] and Augusiak et al.'s universal entanglement witness scheme for two-qubit case [Phys. Rev. A. 77, 030301 (2008)], and thereby provide a universal entanglement witnessing scheme for any state of two two-level quantum systems in a measurement device independent way. We then provide a set of universal witness operators to check NPT-ness (negative under partial transpose) of states of two d -level quantum systems in a measurement device independent way. We conjecture that no such universal entanglement witness exists for PPT (positive under partial transpose) entangled states. As a verification of measurement device independence of entanglement witnessing process, we analyse the robustness of the concerned entanglement witnessing process in the presence of noise in the inputs as well as in the measurement operators.

Reference: Arindam Mallick and Sibasish Ghosh, Phys. Rev. A, vol. 96, pp. 052323 (2017)