Additivity Violations of Random Quantum Channels of non-white Wishart Types

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Abstract

Most core problems in quantum information theory have elementary formulations but still resist solutions, one of which is the additivity conjecture of the minimum output entropy of quantum channels. All previously known results, including extensive numerical work, are consistent with the conjecture until it was shown to be false by Hasting and successive works by others. In this talk, we will briefly introduce the history and developments regarding this problem, present our random quantum channels composed of non-white Wishart ensembles and explore their additivity violations. The noted additivity violations occurring in our constructed random quantum channels are acquired by utilizing random matrix theory.