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ABSTRACT

The power of quantum networks

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We discuss the power of quantum networks for quantum information processing. We start in the classical regime and review the concept of causal networks, designed to understand when a given cause pattern is able to reproduce some observed correlations. We then move to the quantum case and explain how Bell's theorem can be interpreted as a gap between the correlations observed in a network when using classical or quantum causes. We present other classical-quantum separations and discuss about their possible use for the design of novel quantum information protocols with no classical analogue.