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## Linking Quantum Discord to Entanglement in a Measurement

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Abstract:

We present an approach to quantum correlations by quantifying how much entanglement must be created in a von Neumann measurement on a part of a composite quantum system. As a main result we show that the one way information deficit of a bipartite quantum state is equal to the minimal entanglement between the measurement apparatus and the system. The quantum discord is equal to the minimal partial entanglement, that is the part of entanglement which is lost, when we ignore the subsystem which is not measured. We use the relative entropy of entanglement as the corresponding entanglement measure. Further we show that a measurement basis which is optimal for the quantum discord is not necessarily optimal for the one way information deficit. The results are also generalized to multipartite settings.  
(2009).