A Hermitian positive semidefinite operator on a complex Hilbert space represents an entangled quantum state if and only if it cannot be written as a nonnegative combination of pure product states. Entangled states have been shown to be valuable resources for new forms of communication and computation and therefore play a central role in the emergent field of quantum information theory. One of the central problems of quantum information is the classification of entanglement. It has been shown that there exists a strong connection between this problem and the structure of positive linear maps. In this paper, such a connection is exploited to develop a method to construct indecomposable positive linear maps in matrix algebras of arbitrary high dimensions. Central to this construction is the notion of an unextendable product basis.

Reviewed by Adán Cabello

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