

Criterion of Quantum Entanglement and the Covariance Correlation Tensor in the Theory of Quantum Network

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Abstract: This article discusses the covariance correlation tensor (CCT) in quantum network theory for four Bell bases in detail. Furthermore, it gives the expression of the density operator in terms of CCT for a quantum network of three nodes, thus gives the criterion of entanglement for this case, i.e. the conditions of complete separability and partial separability for a given quantum state of three bodies. Finally it discusses the general case for the quantum network of $m \geq 3$ nodes.

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Key words: covariance correlation tensor in quantum network theory, criterion of entanglement, Bell bases, GHZ states

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