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Roman Buniy

Generalized Bell–Mermin Operators

Abstract

We show how generalized Bell–Mermin operators can be derived from eigenvalue equations for states of several qubits. The form of each such operator depends on the state to which it is applied. For example, the original Bell–Mermin operators correspond to the GHZ states. We obtained the new operator that corresponds to the W state of three qubits. Distinct entanglement properties of the GHZ and W states, for example, can now be traced to distinct forms of the generalized Bell–Mermin operators that correspond to them.