Quantum Physics

Non-homogeneous Bell-type Inequalities for Two- and Three-qubit States

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A systematic approach is presented to construct non-homogeneous two- and three-qubit Bell-type inequalities. When projector-like terms are subtracted from homogeneous two-qubit CHSH polynomial, non-homogeneous inequalities are attained and the maximal quantum mechanical violation asymptotically equals a constant with the subtracted terms becoming sufficiently large. In the case of three-qubit system, it is found that most significant three-qubit inequalities presented in literature can be recovered in our framework. We aslo discuss the behavior of such inequalities in the loophole-free Bell test and obtain corresponding thresholds of detection efficiency.

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