

Abstract Submitted
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Tight Bell Inequalities and Nonlocality in Weak Measurement¹

MORDECAI WAEGELL, Institute for Quantum Studies, Chapman University — A general class of Bell inequalities is derived based on strict adherence to probabilistic entanglement correlations observed in nature. This derivation gives significantly tighter bounds on local hidden variable theories for the well-known Clauser-Horne-Shimony-Holt (CHSH) inequality, and also leads to new proofs of the Greenberger-Horne-Zeilinger (GHZ) theorem. This method is applied to weak measurements and reveals nonlocal correlations between the weak value and the post-selection, which rules out various classical models of weak measurement. Implications of these results are discussed.

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