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Efficacy of weak measurement reversal for stochastic amplitude damping DAVID STARLING, Penn State Hazleton, NATHAN WILLIAMS, Willamette University — A recent experiment demonstrated the restoration of entanglement in a photonic system using weak measurement reversal [S. Kim et al., Nature Physics 8, 117 (2012)]. Here, we analyze the statistical properties of entanglement for pairs and triples of entangled qubits subject to stochastic amplitude damping followed by restoration. After the random disturbance, the state is restored by applying a static weak measurement reversal. We then show that the fidelity of the restored state, and therefore its entanglement, can be restored with high success, despite the statistical fluctuations of the disturbance. In particular, we show that the variance of the entanglement of the restored states is substantially reduced, independent of the strength of the disturbance. We conclude with a proposed experimental implementation.

David Starling
Penn State Hazleton

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