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Entanglement Under Restricted Operations: An Analogy to Mixed State Entanglement STEPHEN BARTLETT, ANDREW DOHERTY, Physics, University of Queensland, ROBERT SPEKKENS, Perimeter Institute for Theoretical Physics, HOWARD WISEMAN, Centre for Quantum Dynamics, Griffith University — We show that the classification of two-party pure-state entanglement when local quantum operations are restricted, e.g., constrained by a superselection rule, is analogous in many aspects to the complex structure of mixed-state entanglement, including such exotic phenomena as bound entanglement and activation. This analogy aids in resolving several long-standing issues in the study of entanglement under restricted operations. Specifically, we demonstrate that several types of quantum optical states that possess confusing entanglement properties are analogous to bound entangled states. Also, the classification of entanglement under restricted operations can be much simpler than for mixed state entanglement. For example, we show that the distillability of pure states under Abelian superselection rules can be completely classified.

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