Title:	Using a Lindbladian approach to model decoherence in two coupled nuclear spins via correlated phase damping and amplitude damping noise channels
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Abstract:	In this work, we studied the relaxation dynamics of coherences of different orders present in a system of two coupled nuclear spins. We used a previously designed model for intrinsic noise present in such systems which considers the Lindblad master equation for Markovian relaxation. We experimentally created zero-, single- and double-quantum coherences in several two-spin systems and performed a complete state tomography and computed state fidelity. We experimentally measured the decay of zero- and double-quantum coherences in these systems. The experimental data fitted well to a model that considers the main noise channels to be a correlated phase damping (CPD) channel acting simultaneously on both spins in conjunction with a generalised amplitude damping channel acting independently on both spins. The differential relaxation of multiple-quantum coherences can be ascribed to the action of a CPD channel acting simultaneously on both the spins.
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