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Protection of dissipative quantum state preparation by interlacing the control with dynamical decoupling pulses¹ Z.R. GONG, WANG YAO, Department of Physics, and Center for Theoretical and Computational Physics, The University of Hong Kong — Various dissipative processes have recently be exploited for preparing quantum state with multipartite entanglement between many qubits. Most such schemes are applicable only to an ensemble of identical qubits, and inhomogeneous broadening will reduce the state preparation fidelity. Here we show that by interlacing the dynamical decoupling pulse sequence with the dissipative state preparation control, the errors resulting from the inhomogeneous broadening can be suppressed up to certain order of the pulse interval and the desired entangled states can be prepared with high fidelity. We give two examples where sequence of pi pulses interlaced with dissipative control realize high fidelity preparation of cluster states and many-body singlets of atomic qubits.

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