**State carving in an atom-nanophotonic cavity**

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Coherent quantum control of multiqubit systems represents one of the challenging tasks in quantum science and quantum technology. Here we theoretically investigate the reflectivity spectrum in an atom-nanophotonic cavity with collective nonreciprocal couplings. In the strong-coupling regime with a high cooperativity, we theoretically predict distinct on-resonance spectral dips owing to destructive interferences of chiral couplings. Due to the well-separated multiple dips in the spectrum, a contrasted reflectivity suggests a new control knob over the desired entangled state preparation. We propose to utilize such atom-nanophotonic cavity to quantum engineer the atomic internal states via photon-mediated dipole-dipole interactions and the chirality of decay channels, where the atomic Bell state and W states for arbitrary number of atoms can be tailored and heralded by state carving in the single-photon reflection spectrum. Our results pave the way toward quantum engineering of multiqubit states and offer new opportunities for coherent and scalable multipartite entanglement transport in atoms coupled to nanophotonic devices.