

Abstract Submitted
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Reversible Transfer of Optical to Atomic States ANDREEA BOCA,
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TRACY NORTHUP, H. JEFF KIMBLE — Using a single atom strongly coupled to
a high-finesse cavity, optical states can be reversibly transferred to superpositions
of atomic internal states. We demonstrate this by transferring a weak coherent
state to a superposition of $F=3$ and $F=4$ atomic ground states in a single trapped
Cesium atom. To confirm that the process is reversible, we transfer the atomic
superposition back to an optical state, which is shown to be phase coherent with
the original coherent state.

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