

Abstract Submitted
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Quantum Properties of Coated Cell Beamsplitters MICHAEL HO-
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WALSWORTH, Harvard-Smithsonian CfA — The demonstration of phase coherent
transport of slow light between two separated modes in a paraffin-coated vapor cell
suggests that quantum states may be exchanged between two modes via a randomly
time-dependent coupling to an intermediate spin ensemble. We show that the effi-
ciency of inter-mode exchange can be enhanced by application of a phase shift to the
spin ensemble. Provided that the mode-ensemble coupling is sufficiently slow, the
inter-mode coupling can be quite strong, while inhomogeneous losses are a function
of the distribution of the ensembles' interaction times. These results suggest that
even very classically disordered systems can serve to coherently manipulate quantum
states.

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