

Abstract Submitted  
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**Stored light optimization and optical depth** MASON KLEIN, YAN-HONG XIAO, RITA KALRA, MICHAEL HOHENSEE, DAVID F. PHILLIPS, RONALD L. WALSWORTH, Harvard-Smithsonian CfA — Efficient storage of light in an atomic ensemble requires a large optical depth to contain an entire light pulse inside an atomic medium without incoherent absorption. In an idealized theoretical picture, very large optical depths should improve the efficiency of stored light. In practice, however, additional effects such as spin-exchange, radiation trapping, and non-linear processes can reduce the efficiency at large optical depths. Here we present an experimental study of stored light efficiency in Rb vapor as a function of optical depth, varying experimental parameters such as pulse duration and shape, storage time, retrieval field intensity, and cell and beam geometry.

David Phillips  
Harvard-Smithsonian CfA

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