

Abstract Submitted
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Refractive Index Enhancement in Atomic Media NICHOLAS PROITE, DANIEL SIKES, DENIZ YAVUZ, University of Wisconsin - Madison — We experimentally demonstrate a scheme where a laser beam experiences refractive index enhancement with vanishing absorption. The essential idea is to excite two Raman resonances with appropriately chosen strong laser beams in a far-off resonant atomic system. We have performed our experiments both in vapor cells and in ultracold atomic clouds. Additionally, we discuss a new scheme that achieves giant Kerr nonlinearities using refractive index enhancement. This scheme does not require an intense coupling laser and has the potential to produce all-optical switches and distributed Bragg reflectors at a total energy requirement of tens of photons per atomic cross section.

Nicholas Proite
University of Wisconsin - Madison

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