

Abstract Submitted
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Control of Refractive Index in a Far-Detuned Γ System CHRISTOPHER O'BRIEN, Texas A&M University — We suggest a simple system allowing for resonant enhancement of the refractive index under vanishing absorption. This system consists of two different three-level systems each driven by a far-detuned coherent field at one atomic transition and probed at the adjacent transition. The mechanism of index enhancement under vanishing absorption is clearly outlined in the dressed state picture. In this basis the system represents itself as a superposition of two effective absorbing and amplifying two-level schemes with atomic resonances positively and negatively detuned with respect to the probe field. Simple summation of the susceptibilities of these schemes at the frequency of the probe field results in enhanced refractive index accompanied by vanishing absorption. The experimental realization of such a system in a cell of Rb atoms is analyzed; and an upper limit estimate of the refractive index in such a system is provided.

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