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Raman Self-Focusing and Soliton Propagation in an Atomic Vapor JONATHAN GREEN, NICHOLAS PROITE, BRETT UNKS, DENIZ YAVUZ, University of Wisconsin — We analyze the theory behind Raman soliton propagation and soliton interactions in an atomic medium and discuss recent related experimental results. We use two strong lasers to drive a Raman transition in ^{87}Rb and create a maximally coherent state; this coherence causes the beams to self-focus or self-defocus. A Raman soliton forms when the free-space diffraction is exactly cancelled by the self-focusing effect. We present our recent experimental observations of self-focusing and self-defocusing in this system, the first steps toward atomic Raman solitons.

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