

Abstract Submitted  
for the DAMOP12 Meeting of  
The American Physical Society

**Controlling the group velocity of colliding ultracold atoms and Bose-Einstein condensates using Feshbach resonances** RANCHU MATHEW, EITE TIESINGA, Joint Quantum Institute — Over the last ten years progress has been made in creating atoms lasers, sources of coherent atoms, based on atomic Bose-Einstein condensates in analogy to optical lasers. The analog of nonlinear four-wave mixing has also been experimentally observed when three Bose-Einstein condensates with carefully tuned or phase-matched relative velocities collide. Here, we report on a theoretical proposal to change the group velocity upon collision between two ultracold atom clouds in analogy to slowing of light in dispersive media. We make use of ultracold collisions near a Feshbach resonance, which gives rise to a sharp variation in scattering length with collision energy and thereby changes the group velocity. We also present an initial analysis of the practicality of the proposal.

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Date submitted: 26 Jan 2012

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