

Abstract Submitted  
for the DAMOP17 Meeting of  
The American Physical Society

**Quantum simulation using photons and room temperature atoms**<sup>1</sup> CONNOR GOHAM, MEHDI NAMAZI, EDEN FIGUEROA, State Univ of NY- Stony Brook — Recent proposals show that Electromagnetically Induced Transparency (EIT) using quantized light fields and atoms can be a promising and alternative approach for quantum simulation [1,2]. In our experiment we generate a dark state polariton (DSP) through the storage of a pulse of light in a room temperature vapor and retrieve it using a multi-lambda scheme including the D1 and D2 lines of rubidium 87 atoms [3]. By applying a position dependent magnetic field during retrieval we have engineered the resultant coupled DSPs to follow a nonlinear Dirac Hamiltonian analog to the Jackiw-Rebbi model describing a Dirac field with spatially variable mass. [1] Scientific Reports, 4:6110 2014. [2] Phys. Rev. Lett., 105:173603 2010. [3] Nature Communications, 5:5542 2014.

<sup>1</sup>The work was supported by the US-Navy Office of Naval Research, grant number N00141410801, the National Science Foundation, grant number PHY-1404398 and the Simons Foundation, grant number SBF241180. B.

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Date submitted: 29 Jan 2017

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