

Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Quantum many-body physics of interacting photons SEBNEM GUNES SOYLER, THOMAS POHL, Max Planck Institute for the Physics of Complex Systems, Dresden — We study stationary light of massive photons emerging in a gas of interacting atoms via electromagnetically induced transparency. Path integral Monte Carlo simulations permit an approximation-free determination of the equilibrium phases of the resulting two-component system composed of photons and strongly interacting spin waves. Using this approach we identify a range of interesting quantum phases for varying coupling strengths between the two components, such as photonic superfluids that develop long-range diagonal order for certain parameters. An experimental realization via strongly interacting Rydberg gases will also be discussed.

Sebnem Gunes Soylar
Max Planck Institute for the Physics of Complex Systems, Dresden

Date submitted: 30 Jan 2014

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