

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Manipulation of a two-photon pump in superconductor – semiconductor heterostructures PETER P. ORTH, Karlsruhe Institute of Technology (KIT), PAUL BAIREUTHER, Instituut-Lorentz, Universiteit Leiden, ILYA VEKHTER, Louisiana State University, JOERG SCHMALIAN, Karlsruhe Institute of Technology (KIT) — We investigate the photon statistics, entanglement and squeezing of a pn-junction sandwiched between two superconducting leads, and show that such an electrically-driven photon pump generates correlated and entangled pairs of photons. In particular, we demonstrate that the squeezing of the fluctuations in the quadrature amplitudes of the emitted light can be manipulated by changing the relative phase of the order parameters of the superconductors. This reveals how macroscopic coherence of the superconducting state can be used to tailor the properties of a two-photon state.

Peter P. Orth
Karlsruhe Institute of Technology (KIT)

Date submitted: 14 Nov 2013

Electronic form version 1.4