Quantum Physics

Generation and Direct Detection of Broadband Mesoscopic Polarization-Squeezed Vacuum

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(Submitted on 4 Jan 2009)

Using a traveling-wave OPA with two orthogonally oriented type-I BBO crystals pumped by picosecond pulses, we generate vertically and horizontally polarized squeezed vacuum states within a broad range of wavelengths and angles. Depending on the phase between these states, fluctuations in one or another Stokes parameters are suppressed below the shot-noise limit. Due to the large number of photon pairs produced, no local oscillator is required, and 3dB squeezing is observed by means of direct detection.

Comments: 4 pages, 4 figures, submitted to PRL
Subjects: **Quantum Physics (quant-ph)**
Cite as: **arXiv:0901.0371v1 [quant-ph]**

Submission history

From: Maria Chekhova Dr [view email]
[v1] Sun, 4 Jan 2009 12:55:13 GMT (153kb)

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