

Quantum Physics

Generation and Direct Detection of Broadband Mesoscopic Polarization-Squeezed Vacuum

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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.

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