Temporally uncorrelated photon-pair generation by dual-pump four-wave mixing

We study the preparation of heralded single-photon states using dual-pump spontaneous four-wave mixing. The dual-pump configuration, which in our case employs cross-polarized pumps, allows for a gradual variation of the nonlinear interaction strength enabled by a birefringence-induced walk-off between the pump pulses. The scheme enables the preparation of highly pure heralded single-photon states, and proves to be extremely robust against the effect of nonlinear phase modulation at the required photon-pair production rates.

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