

# Generating pure single-photon states via spontaneous four-wave mixing in a system of coupled microresonators

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## Abstract

© 2018 Astro Ltd. We present the optimal design for an on-chip single-photon source based on spontaneous four-wave mixing in a system of coupled ring microresonators, which provides the frequency-uncorrelated joint spectral amplitude of the biphoton field and thereby the generation of pure single-photon heralded states. A simple method is proposed for suppressing negative dispersion effects by optimizing the controlled spectroscopic parameters of the system. It is shown that the optimal coupling parameters, in combination with the optimal spectral width of the pump pulse, give rise to the highest purity of the heralded photons for a given pump linewidth.

<http://dx.doi.org/10.1088/1612-202X/aad990>

## Keywords

integrated optics devices, microresonator, quantum information and processing, Single-photon source, spectrum optimization, spontaneous four-wave mixing

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