

# Third-order spontaneous parametric down-conversion in a ring microcavity

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## Abstract

© 2016 Astro Ltd. The theory of third-order spontaneous parametric down-conversion (TOSPDC) in a ring waveguide microcavity is developed. Analytical expressions for the rate of photon triplet emission are presented for both the monochromatic-pump and pulsed-pump regimes. In the latter case, rising exponential pulses are considered as optimal ones for the cavity excitation. It is demonstrated by numerical simulations that a silicon-nitride based ring microcavity can be a promising system for developing narrowband sources of photon triplets based on TOSPDC.

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## Keywords

resonator, spontaneous parametric down-conversion, waveguide