

Optimizing the dispersion properties of a ring microresonator

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Abstract

© 2017, Institution of Russian Academy of Sciences. All rights reserved. The work is devoted to the problem of developing integrated single-photon sources based on spontaneous four-wave mixing in ring microresonators. Considering the silicon nitride microresonator as an example, we calculate the group velocity dispersion in a wide wavelength range for the case when the ring resonator is composed of straight and curved sections, and show that for different pump wavelengths it is possible to find an optimal ratio of the height and width of the waveguide, thereby achieving zero group velocity dispersion at a minimum height. Such waveguides, which provide zero dispersion and have a minimum height, are optimal for creating ring microresonators that generate single-photon states via non-degenerate spontaneous four-wave mixing.

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Keywords

Group velocity, Ring microresonator, Single-photon sources, Spontaneous four wave-mixing

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