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Accession number:13033189
Title:Low Raman-noise correlated photon-pair generation in a dispersion-engineered chalcogenide As_2S_3 planar waveguide
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Source title:Optics Letters
Abbreviated source title:Opt. Lett. (USA)
Volume:37
Issue:16
Publication date:15 Aug. 2012
Pages:3393-5
Language:English
ISSN:0146-9592
CODEN:OPLEDP
Document type:Journal article (JA)
Publisher:Optical Society of America
Country of publication:USA
Material Identity Number:EV60-2012-006
Abstract:We demonstrate low Raman-noise correlated photon-pair generation in a dispersion-engineered 10 mm As_2S_3 chalcogenide waveguide at room temperature. We show a coincidence-to-accidental ratio (CAR) of 16.8, a 250 times increase compared with previously published results in a chalcogenide waveguide, with a corresponding brightness of 3 × 10^5 pairs · s^{-1} · nm^{-1} generated at the chip. Dispersion engineering of our waveguide enables photon passbands to be placed in the low spontaneous Raman scattering (SpRS) window at 7.4 THz detuning from the pump. This Letter shows the potential for As_2S_3 chalcogenide to be used for nonlinear quantum photonic devices.
Number of references:17
Inspec controlled terms:arsenic compounds - chalcogenide glasses - optical correlation - optical dispersion - optical planar waveguides - Raman spectra
Uncontrolled terms:Raman-noise correlated photon-pair generation - dispersion-engineered chalcogenide planar waveguide - coincidence-to-accidental ratio - dispersion engineering - photon passbands - spontaneous Raman scattering window - nonlinear quantum photonic devices - size 10 mm - frequency 7.4 THz - temperature 293 K to 298 K - As_2S_3
Inspec classification codes:A4280L Optical waveguides and couplers - A4282 Integrated optics - B4130 Optical waveguides - B4140 Integrated optics
Numerical data indexing:frequency 7.4E+12 Hz;size 1.0E-02 m;temperature 2.93E+02 2.98E+02 K
Chemical indexing:As2S3/bin As2/bin S3/bin As/bin S/bin
Treatment:Practical (PRA)

Discipline:Physics (A); Electrical/Electronic engineering (B)
DOI:10.1364/OL.37.003393
Database:Inspec
IPC Code:G02B6/12