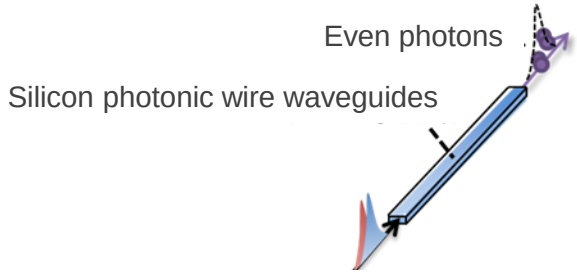
Tohoku Univ. Technology

Squeezed Light Generator

Eliminate the temporal fluctuation of the phase difference.
Applicable to optical quantum computers.



Two-wavelength excitation light pulses

Overview

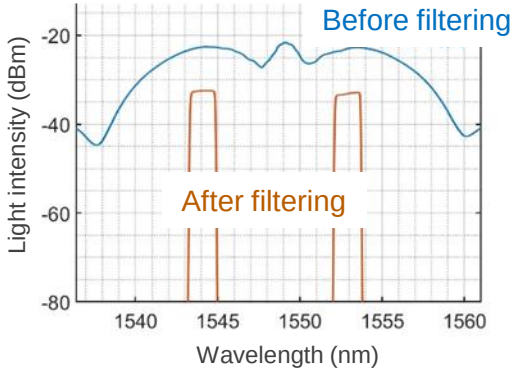
In optical quantum computation, a computation method called Gaussian boson sampling (GBS) is used, and light with the property of quantum superposition called single-mode squeezed vacuum(SMSV) is used as input light. In order to realize a large-scale GBS system, the silicon photonic wire waveguides are expected as a highly integrated platform. However, there are few examples of SMSV generation in the silicon photonic wire waveguides.

Generation of SMSV requires two-wavelength excitation light pulses, and there are prior technologies that synthesize the first and second optical pulses. However, the phase difference between the first and second optical pulses changes over time, makes accurate measurement of the SMSV impossible. Temporal fluctuations of noise photons mixed into the SMSV also inhibit accurate measurement.

A special optical wavelength filter outputs the first and second optical pulses to a coaxial path, and by eliminating the temporal fluctuation of the phase difference, a stabilized SMSV is obtained by the present invention.

Features・Outstandings

Excitation light spectrum



Product Application

- ☐ Optical Circuits
- ☐ Optical Quantum Chips
- ☐ Optical Quantum Computers

Related Works

[1] Kimura et al., The 70th JSAP spring meeting, 15p-PB02-2(2023)

IP Data

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