Device: 2 × 2 adiabatic 3 dB coupler using sub-wavelength grating waveguides

Description: A compact, broadband, 2×2 adiabatic 3 dB coupler using sub-wavelength gratings (SWGs) for silicon-on-insulator waveguides. Two SWG waveguides that support TE mode and have tapered waveguide widths were used to achieve an adiabatic mode evolution of the two-waveguide system for broadband 3 dB power splitting.

Advantage: The device has an overall coupler length of 50 μm and achieves broadband power splitting over a 130-nm wavelength range with an imbalance of no greater than ±0.3 dB and with low excess losses of less than 0.5 dB.

Splitting ratios were extracted from an unbalanced MZI integrated with two identical adiabatic 3 dB couplers.

Excess loss was estimated from MZI spectra responses.

Reference Paper:

Han Yun, Yun Wang, Fan Zhang, Zeqin Lu, Stephen Lin, Lukas Chrostowski, and Nicolas A. F. Jaeger, "Broadband 2 × 2 adiabatic 3  dB coupler using silicon-on-insulator sub-wavelength grating waveguides," Opt. Lett. 41, 3041-3044 (2016)