

BRAGG GRATINGS IN SUBWAVELENGTH GRATING METAMATERIAL WAVEGUIDES

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Subwavelength grating metamaterial waveguides (SWG) based on silicon-on-insulator (SOI) platform have become important building blocks in silicon photonics devices. SWG refractive index engineering brings unprecedented flexibility to the design of SOI waveguide components without excessive technological demands. We have recently published the first systematic study of narrowband reflection and transmission spectral filters in SOI SWG waveguides comprising Bragg gratings with lateral loading segments. The design was based on assumption that the period of the Bragg grating is twice larger than the period of the SWG core waveguide. As a part of this study we showed that the standard coupled mode theory (CMT) can be successfully applied to the analysis of such gratings, too. In this contribution we analyze the CMT design approach in more detail. “Rigorous” (full-wave) Fourier modal method (FMM) is used to determine the CMT parameters and to verify the correctness of CMT results. Experimental results of narrowband Bragg filters will be also presented.