課題番号 :F-14-UT-0142
利用形態 :機器利用
利用課題名(日本語) :シリコンフォトニクスのための MIDEX(中程度屈折率差系)光学系の研究
Program Title (English) :Mid-Refractive Index Contrast Optics for Si Photonics
利用者名(日本語) :チャイサクル パピチャヤ、 和田 一実
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1. 概要(Summary)

I aim to develop an integrated photonic circuit platform on bulk Silicon wafer based on mid-refractive index contrast optics for Si Photonics for the future dense wavelength-division multiplexing system. This research project will study electro-optical properties of the CMOS compatible material of GeSi, SiN, SiO_xN_y, and SiO_2 on bulk Si wafer for future telecom systems.

2. 実験(Experimental)

I have been using several machines at the Takeda cleanroom during 2014-2015. I enormously profit from the use of ADVANTEST F5112 e-beam lithography, allowing me to obtain large and highly-resolute structures rapidly. Equally important, I use the PVD sputtering machine, which allows me to study Silicon nitride materials deposited at low-temperature for wavelength -division multiplexing system. I also employ CE-300I ICP-RIE to pattern the device. During all the process, scanning electron microscope (SEM) and optical microscope are widely used to observe the progress.

3. 結果と考察(Results and Discussion)

I have finished the process development and fabrication of an array waveguide grating(AWG) using Takeda cleanroom facilities. The experiment and analysis are under investigation.

4. その他・特記事項(Others)

The work is in close collaboration with the University of Paris in France.

5. 論文・学会発表(Publication/Presentation)

(1) P. Chaisakul et al., SPIE Photonics Asia, 92770E-92770E-7, Beijing China, 9-11 Oct 2014

(2) P. Chaisakul et al., Japanese Society of Applied Physics, 18a-A18-1, Hokkaido Japan, 17-20 Sep 2014

(3) P. Chaisakul et al., The 7th Forum on the Science and Technology of Silicon Materials, PT07-1, pp.157, Hamamatsu, Japan, 19-22 October 2014

6. 関連特許(Patent)

None