

**Room I (203)**

**Session Title** 27I1 / [T10] Biosensors  
**Date & Time** Thursday, 27 August, 11:00 ~ 12:30  
**Session Chair** Jin Tae Kim (ETRI, Korea)

**[27I1-1] 11:00~11:30 Invited Talk**

**Photonics beyond Multiple Light Scattering**

*Wonshik Choi*  
*Korea University, Korea*

I will introduce an experimental method that makes use of multiple-scattered waves for performing optical imaging and enhancing light energy delivery through scattering media.

**[27I1-2] 11:30~11:45**

**A Portable Grating-Based Spectrometer for Plasmonic Biosensing Applications**

*Shu-Cheng Lo<sup>1</sup>, En-Hung Lin<sup>2</sup>, Pei-Kuen Wei<sup>2</sup>, and Wan-Shao Tsai<sup>1</sup>*  
*<sup>1</sup>National Chi Nan University, Taiwan, <sup>2</sup>Academia Sinica, Taiwan*

A portable grating-based spectrometer for plasmonic biosensing is presented. Spectral resolution on the order of nm is achieved within wavelength range 628-640 nm. The spectrometer shows good sensitivity response by testing the biosensor with glycerin solutions.

**[27I1-3] 11:45~12:00**

**Molecular Range Light Confinement of Metal-Air-Metal Structure for Biosensor Applications**

*Jaehak Lee<sup>1</sup>, Sangkeun Sung<sup>2</sup>, and Jung H. Shin<sup>1</sup>*  
*<sup>1</sup>KAIST, Korea, <sup>2</sup>Korea Institute of Machinery and Materials, Korea*

We report on an MIM-type plasmonic resonator with a 4-nm slot. The gap was defined using selfaligned deposition using conventional photolithography. The structure shows great promise for a biosensor, with 12 nm/nm surface sensitivity at least.

**[27I1-4] 12:00~12:15**

**Disorder Effect on Broad-angle Reflection from Morpho-inspired Structures**

*Bokwang Song, Seok Chan Eom, and Jung H. Shin*  
*KAIST, Korea*

We investigate the effect of disorder on broad-angle reflection from Morpho-inspired structures. And we also propose Morpho-inspired structures applying grating diffraction to fully reproduce the reflection of Morpho butterflies.

**[27I1-5] 12:15~12:30**

**Three Dimensional Optical Manipulation on a Lap-on-a chip Device through Standing Wave**

*Jisu Kim and Jung H. Shin*  
*KAIST, Korea*

We propose and demonstrate optical manipulation in three dimensional space through standing wave. FEM simulations suggest a capability of trapping 1 μm particle at room temperature, and stationary trapping by counter propagating beams is achieved.

**Room J (204)**

**Session Title** 27J1 / [T12] Integrated Optical Devices  
**Date & Time** Thursday, 27 August, 11:00 ~ 12:15  
**Session Chairs** Yong-Zhen Huang (Chinese Academy of Sciences, China)  
Min-Suk Kwon (UNIST, Korea)

**[27J1-1] 11:00~11:30 Invited Talk**

**Narrow Linewidth Tunable Lasers for Digital Coherent System**

*Toshikazu Mukaihara, Toshio Kimura, and Hiroyuki Koshi*  
*Furukawa Electric, Japan*

We describe μ-TLA characteristics with DFB/DR laser array based narrow linewidth tunable laser. We also introduce ITXA of a co-packaged DFB array based laser and InP-based modulator for metro digital coherent application.

**[27J1-2] 11:30~11:45**

**Microring-based Tunable Optical Delay Lines for Optical Time-division Multiplexers**

*Zhihua Yu<sup>1</sup>, Xin Jin<sup>1</sup>, Jun Chen<sup>1</sup>, Gaifang Wang<sup>1</sup>, and David R. Selyiah<sup>2</sup>*  
*<sup>1</sup>China University of Geosciences, China, <sup>2</sup>University College London, UK*

Microring-based tunable optical delay lines are proposed to construct an optical time division multiplexer (OTDM) system, with which, we can get ultrahigh bit rates with several low-speed channels.

**[27J1-3] 11:45~12:00**

**Dielectric-Loaded Magnetic and Nonmagnetic Plasmonic Waveguides on SOI Wafer**

*Terunori Kaihara and Hiromasa Shimizu*  
*Tokyo University of Agriculture and Technology, Japan*

Propagation characteristics of magnetic and nonmagnetic plasmon waveguides using Au and Fe have been studied. The devices are theoretically optimized and fabricated on a SOI substrate. The transmission characteristics are investigated on those waveguides.

**[27J1-4] 12:00~12:15**

**Design of Optical Isolators Utilizing Directional Coupling within Asymmetric Waveguides**

*Masashi Hosoda, Jo Sato, Danish Wahid, Takaya Sato, and Hiromasa Shimizu*  
*Tokyo University of Agriculture and Technology, Japan*

We designed magneto-optic waveguide isolators based on the nonreciprocal coupling by the coupled mode theory. Optical isolation over 40 dB was estimated with the waveguide length of 700 μm.