Room C (103)

Session Title 26C3 / [T02] Supercontinuum Generation
Date & Time Wednesday, 26 August, 15:45 ~ 17:45
Session Chair Kyung Taec Kim (IBS/GIST, Korea)

[26C3-1] 15:45~16:15 Invited Talk

Strong-field-ionization Induced Air Lasers

Bin Zeng[1], Jinping Yao[1], Wei Chu[1], Hongqiang Xie[1], Ziting Li[1], Jielei Ni[1], Guihua Li[1], Chenrui Jing[1], Huailiang Xu[2], and Ya Cheng[1]

[1]Shanghai Institute of Optics and Fine Mechanics ,China, [2]Jilin University, China

We report on generation of strong-field-ionization induced free-space air lasers and explore their applications in remote sensing and molecular physics.

[26C3-2] 16:15~16:30

Interaction between a Single Water Droplet and a Laser Filament

Cheonha Jeon, Danielle Harper, Khan Lim, Magali Durand, Michael Chini, Matthieu Baudelet, and Martin Richardson

University of Central Florida, USA

The analysis of the destruction and reformation of a single laser filament interacting with a single micro-sized water droplet allows a better understanding of filament propagation through atmospheric aerosols.

[26C3-3] 16:30~16:45

Optical Guiding Using Femtosecond Laser Filamentation

Xiao-Long Liu[1], Xin Lu[1], Zhi Gui Du[1], and Jie Zhang[1,2]

[1]Chinese Academy of Sciences, China, [2]Shanghai Jiao Tong University, China

Optical guiding of the laser pulse using filamentation is investigated experimentally. Guiding effect as a function of temporal delay shows that it is the most effective when pump beam goes 8ps before signal beam.

[26C3-4] 16:45~17:00

Highly Coherent Supercontinuum Pumped by Picosecond Pulse with a PCF Taper

Feng Li[1], Qian Li[2], Jinhui Yuan[1], and P. K. A. Wai[1]

[1]Hong Kong Polytechnic University, Hong Kong, China, [2]Peking University, China

We propose to directly generate highly coherent supercontinuum with single noisy picosecond pump pulses by self-similarly pre-compress them down to ~50 fs with negligible pedestal in a nonlinearity engineered large mode area photonic crystal fiber taper.

[26C3-5] 17:00~17:15

High-order Modes Supercontinuum Generation in a Large-core Photonic Crystal Fiber

Stanislav Leonov[1], Vladimir Lazarev[1], Mikhail Tarabrin[1], Dmitriy Dvoretskiy[1], Valeriy Karasik[1], and Andrey Pryamikov[2]

[1]Bauman Moscow State Technical University, Russia, [2]Russian Academy of Sciences, Russia

We report on experimental investigation spectral properties of high-order modes SC generation in a large-core photonic crystal fiber with high air-filling fraction. Optical properties of large-core photonic crystal fiber were analysed. The SC generation in high-order modes LP_{11}, LP_{21} and LP_{02} were observed under different input conditions.

[26C3-6] 17:15~17:30

Supercontinuum Generation in Suspended Core Photonic Crystal Fibers Doped with Silver Nanoparticle

Surajit Bose[1], Rik Chattopadhyay[1], Samudra Roy[2], and Shyamal K. Bhadra[1]

[1]CSIR-Central Glass and Ceramic Research Institute, India, [2]Indian Institute of Technology, India

We study optical properties of silver nanoparticle doped highly nonlinear silica suspended core photonic crystal fiber. We numerically obtained a nearly octave-spanning supercontinuum in few centimeters of such doped fiber with very low input power.

[26C3-7] 17:30~17:45

Supercontinuum Notch Shaping via Fiber Bragg Grating for the Excitation Source in Coherent Anti-Stokes Raman Spectroscopy

Seung Ryeol Oh, Daewon Kang, Jindoo Choi, Jin Hwan Kim, Hyub Lee, Kyung-Soo Kim, and Soohyun Kim

KAIST, Korea

We show the feasibility of an all-fiber based single-pulse coherent anti-Stokes Raman spectroscopy. The system consists of a supercontinuum source from erbium-doped fiber amplifier and fiber Bragg grating for notch filtering.

Room D (106)

Session Title 26D3 / [T06] Novel Laser and Optical Technologies in Manufacturing
Date & Time Wednesday, 26 August, 15:45 ~ 17:30
Session Chair Sung Ho Jeong (GIST, Korea)

[26D3-1] 15:45~16:15 Invited Talk

High Performance Materials Processing Using Tailored Femtosecond Laser Pulses

Koji Sugioka[1], Katsumi Midorikawa[1], Fei He[2], and Ya Cheng[2]

[1]RIKEN Center for Advanced Photonics, Japan, [2]Shanghai Institute of Optics and Fine Mechanics, China

Tailored femtosecond laser pulses can enhance the performance for materials processing. Temporarily tailored femtosecond laser pulses are employed for high efficiency glass welding, while the spatially one, for formation of taper-free through Si vias.

[26D3-2] 16:15~16:45 Invited Talk

Optical Fabrication and Operation of Micronano-Robots

Hong-Bo Sun

Jilin University, China

Femtosecond laser direct writing (FsLDW) was utilized to create micronano-robots, which were then demonstrated to be optically, electronically, magnetically or chemically manipulated. An appropriate operation mechanism is considered as essential for functionalizing the robots.

[26D3-3] 16:45~17:00

Physical Model for Subsurface Silicon Writing

Onur Tokel, Ahmet Turnali, Ihor Pavlov, and F. Ömer Ilday

Bilkent University, Turkey

We have recently reported a direct laser writing method enabling buried structures deep inside silicon. Here we study the formation of these subsurface structures. We take advantage of Nonlinearity Engineering to understand this new phenomenon.

[26D3-4] 17:00~17:15

Material Response of Semiconductors Irradiated with IR Ultrashort Laser Pulses

Ilya Mingareev, Mark Ramme, and Martin Richardson

University of Central Florida, USA

We utilize near- and mid-IR ultrafast laser radiation to investigate the processing of crystalline silicon with different dopants. A numerical model is adopted to simulate the material response depending on the wavelength and the dopant concentration.

[26D3-5] 17:15~17:30

Experimental and Numerical Investigation of Laser-based Short Wavelength Plasma Sources

Homaira Parchamy, John Szilagyi, Majid Masnavi, and Martin Richardson

University of Central Florida, USA

Laser-based plasma lamps are of particular interest in the semiconductor industry. This study examines the optimum regions of laser-plasma operational space for a number of intense laser-irradiated mass-limited droplet source scenarios.