

Room A (101)

Session Title 26A2 / [T01] Mode-Locked Lasers I
Date & Time Wednesday, 26 August, 11:00 ~ 12:30
Session Chair Zhigang Zhang (Peking University, China)

[26A2-1] 11:00~11:30 **Invited Talk**

Gate-Controlled All-Fiber Graphene Device and Its Application to Ultrafast Fiber Laser System

Dong-Il Yeom
Ajou University, Korea

Actively controlled all-fiber graphene device exhibiting strong graphene-light interaction is demonstrated through electrical gating of graphene layer, and its application as a tunable nonlinear saturable absorber in ultrafast fiber laser system is discussed.

[26A2-2] 11:30~11:45

High Frequency 60 fs Mode-Locked Fiber Laser

Yanrong Song, Zhiyuan Dou, and Jinrong Tian
Beijing University of Technology, China

An Er-doped all fiber laser with high-repetition-rate of 224-MHz is demonstrated. The mode locking mechanism is nonlinear polarization rotation mode-locking. The fiber laser is compact and simple with pulse-width of 60-fs and spectral-width of 60-nm.

[26A2-3] 11:45~12:00

All-Polarization Maintaining FemtoSecond Fiber Laser Based on Evanescent Field Interaction with SWCNT Saturable Absorber

H. Jeong^{1,2}, S. Y. Choi¹, F. Rotermund¹, S. B. Lee², K. Lee², and D.-I. Yeom¹
¹Ajou University, Korea, ²KIST, Korea

We demonstrate an all-polarization maintaining Er-doped soliton fiber laser using evanescent field interaction with carbon nanotube saturable absorber. Fabricated fiber laser stably generates linearly polarized 510-fs soliton pulses with polarization extinction ratio of 18 dB.

[26A2-4] 12:00~12:15

Demonstration of Femtosecond Ti:Sapphire Laser Oscillation Pumped by InGaN Diode Lasers

Ryota Sawada, Hiroki Tanaka, Ryosuke Kariyama, Kenichi Hirose, and Fumihiko Kannari
Keio University, Japan

We demonstrate a mode-locked Ti:sapphire laser pumped by green InGaN laser diodes from both sides of the crystal. An output power of 45 mW is achieved in modelocking with a SESAM (semiconductor saturable absorber mirror).

[26A2-5] 12:15~12:30

Laser Diode Pumped Kerr-Lens Mode-Locking Nd,Y-Codoped CaF₂ Laser

Jiangfeng Zhu¹, Lijuan Zhang¹, Juting Zhang¹, Ziyi Gao¹, Junli Wang¹, Zhiyi Wei², Liangbi Su¹, and Jun Xu¹

¹Xidian University, China, ²Chinese Academy of Sciences, China

We realized a diode-pumped Kerr-lens modelocking operation in a Nd,Y-codoped CaF₂ laser. Pulses with 357 fs duration at 1063 nm were obtained. The average power was 210 mW under 5 W pump.

Room B (102)

Session Title 26B2 / [T06] Ultrashort Pulsed Laser 3D Processing
Date & Time Wednesday, 26 August, 11:00 ~ 12:30
Session Chair Sung Hak Cho (KIMM, Korea)
Jiyeon Choi (KIMM, Korea)

[26B2-1] 11:00~11:45 **Tutorial**

Volume Processing of Transparent Materials by Ultrashort Laser Pulses: Potential and Applications

Stefan Nolte^{1,2}, Klaus Bergner¹, Ria Krämer¹, Daniel Richter¹, Sören Richter¹, Christian Voigtländer¹, and Felix Zimmermann¹

¹Friedrich Schiller University Jena, Germany, ²Fraunhofer Institute for Applied Optics and Precision Engineering, Germany

Internal structuring of transparent materials using ultrashort laser pulses enables a plethora of applications. This includes precise cutting, welding but also the realization of various photonic components like waveguides, artificial birefringent devices or Bragg gratings.

[26B2-2] 11:45~12:15 **Invited Talk**

Femtosecond Laser Patterning of Plasmonic and Nonlinear Optical Properties in Silver-doped

Y. Petit^{1,2}, M. Vangheluwe¹, N. Marquestaut¹, T. Cardinal² and Lionel Canioni¹

¹Universite Bordeaux, France, ²Institut de Chimie de la Matière Condensée de Bordeaux, France

Nowadays the optical properties and structural arrangements of several inorganic materials can be modified using ultrafast and intense laser sources. Among several lithographic techniques, Direct Laser Writing (DLW) considered as a maskless patterning process, presents numerous advantages over usual techniques. DLW offers rapid patterning at sub-micrometer resolutions, with flexibility and scalability. At last, true three-dimensional structuration is allowed thanks to non-linear interaction in optical transparent materials. In this context, DLW of materials containing photosensitive agents can initiate photochemical processes, opening routes toward the design of nanocomposites. DLW techniques can modify the size, the shape, and the arrangement of the metal clusters. It is a powerful and flexible tool to control and optimize the linear and nonlinear properties of metallo-dielectric composites. Many groups have shown interest in patterning metals in three dimensions in transparent media such as glasses or polymers. This becomes particularly challenging when structures much smaller than the diffraction limit need to be patterned for infrared or optical applications.

[26B2-3] 12:15~12:30

Extraordinary Characteristics of Spatiotemporally Focused Laser Pulses and Their Roles in Precision Materials Processing

Fei He¹, Zhaohui Wang¹, Bin Zeng¹, Jielei Ni¹, Ya Cheng¹, and Koji Sugioka²

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

We report on the observation of novel spatiotemporal effects of a spatiotemporally focused beam, which play important roles in many applications of femtosecond laser processing of materials.