Room C (103)

Session Title 26C2 / [T02] Novel Materials
Date & Time Wednesday, 26 August, 11:00 ~ 12:30
Session Chair Nan Ei Yu (APRI/GIST, Korea)

[26C2-1] 11:00~11:15

Heat-Spreading Role of Graphene Studied by Coherent Phononic Propagations

Hoonil Jeong[1], A. J. Minnich[2], Soon-Young Park[1], Hyeong-Yong Hwang[1], Sung-Yong Yoon[1], and Young-Dahl Jho[1,2]

[1]GIST, Korea, [2]California Institute of Technology, USA

We have experimentally explored the role of graphene transferred on top of a GaN-based light-emitting diode (LED) as a heat spreading layer by monitoring the propagations of coherent acoustic phonons (CAPs).

[26C2-2] 11:15~11:30

Ultrafast Mid-infrared Investigations on the Surface Dirac Fermions with Topological Phase Transition

Jun Park[1], Sangwan Sim[1], Nikesh Koirala[2], Matthew Brahlek[2], Seongshik Oh[2], and Hyunyong Choi[1]

[1]Yonsei University, Korea, [2]Rutgers the State University of New Jersey, USA

We present ultrafast optical studies of the Dirac surface dynamics in a topological insulator Bi_2Se_3 via optical pump mid-infrared probe spectroscopy. We observed largely enhanced carrier relaxation when the topological-phase transition takes place.

[26C2-3] 11:30~11:45

Electrically Controllable Detection of Transverse Acoustic Phonons

Young-Dahl Jho[1], Hoonil Jeong[1], S. Y. Yoon[1], and C. J. Stanton[2]

[1]GIST, Korea, [2]University of Florida, USA

In this work, we report on the electrical manipulation of photoelastic properties in wurtzite semiconductors for allowing transverse acoustic (TA) phonon detection.

[26C2-4] 11:45~12:00

Coherent Phonon Dynamics in Single-Layer and Multilayer Graphene

Taeyoung Jeong[1,2], Suyong Jung[2], and Kiju Yee[1]

[1]Chungnam National University, Korea, [2]KRISS, Korea

Coherent phonon dynamics of single-layer graphene (SLG) and multi-layer graphene (MLG) on sapphire substrate were investigated using femtosecond pump-probe techniques. The center peak of G-mode phonon redshift with the number of graphene layer and the temperature increases in the temperature range between 300 K and 900 K. Also, the dephasing time upshift from 0.82 ps to 1.14 ps as the number of graphene layer increases. The results reflect thermal expansion and damping constant of SLG and MLG.

[26C2-5] 12:00~12:15

Observation of the Mid-infrared 1s Intraexcitonic Dynamics in Monolayer MoS_2

Soonyoung Cha[1], Ji Ho Sung[2], Sangwan Sim[1], Jun Park[1], Moon-Ho Jo[2], and Hyunyong Choi[1]

[1]Yonsei University, Korea, [2]POSTECH, Korea

We report the first measurement of ultrafast mid-infrared (IR) spectroscopy in monolayer MoS_2. The observed mid-IR dynamics shows large photo-excited absorption, indicating the predominant intraexcitonic transition from the ground to the higher-lyingexcitonic states.

[26C2-6] 12:15~12:30

Ultrafast Mid-IR Carrier Dynamics in Three-Dimensional Dirac Semimetal Cd_3As_2

Chunhui Zhu[1], Xiang Yuan[2], Yongbing Xu[1], Faxian Xiu[2], and Fengqiu Wang[1]

[1]Nanjing University, China, [2]Fudan University, China

We investigated ultrafast carrier dynamics in Cd_3As_2 at 2.6 μm. Single-exponential decay and saturable absorption features are observed. The ultrafast optical nonlinearity suggests that Cd_3As_2 is useful for mode-locking lasers in the mid-IR range.

Room D (106)

Session Title 26D2 / [T04] Ultrahigh Intensity Lasers II
Date & Time Wednesday, 26 August, 11:00 ~ 12:30
Session Chair Noriaki Miyanaga (Osaka University, Japan)

[26D2-1] 11:00~11:30 Invited Talk

0.1 Hz 4.0 PW Ti:Sapphire Laser at CoReLS

Jae Hee Sung[1,2], Seong Ku Lee[1,2], Hwang Woon Lee[1], Je Yoon Yoo[1], Tae Moon Jeong[1,2], and Chang Hee Nam[1]

[1]IBS, Korea, [2]GIST, Korea

0.1-Hz 4.0-PW laser is being developed for research on relativistic laser-matter interactions. The upgrade will be achieved by increasing the laser energy of the current 1.5- PW laser to 80 J and decreasing the pulse duration to 20 fs.

[26D2-2] 11:30~12:00 Invited Talk

Recent Progress on an Upgrade of the J-KAREN Laser at JAEA

H. Kiriyama[1], M. Mori[1], A. S. Pirozhkov[1], K. Ogura[1], M. Nishiuchi[1], M. Kando[1], H. Sakaki[1], A. Kon[1], M. Kanasaki[1], H. Tanaka[2], Y. Fukuda[1,2], J. Koga[1], A. Sagisaka[1], T. Zh. Esirkepov[1], Y. Hayashi[1], H.Kotaki[1], S. V. Bulanov[1], K. Kondo[1], Y. Mashiba[1,3], M. R. Asak[3], O. Slezak[4], D. Vojna[4], M. Sawica-Chyla[4], V. Jambunathan[4], A. Lucianetti[4], and T. Mocek[4]

[1]Japan Atomic Energy Agency, Japan, [2]Kyushu University, Japan, [3]Kansai University, Japan, [4]Institute of Physics, Czech Republic

We describe recent advances on the J-KAREN laser upgrade to provide an intensity capacity surpassing 10^{22} W/cm^2 at 0.1 Hz. The present high-spatiotemporal quality pulses of 20 J will be amplified in an additional amplifier.

[26D2-3] 12:00~12:30 Invited Talk

Ultra-high Intensity Laser-Matter Interaction Studies at RRCAT, India

Juzer Ali Chakera, Anand Moorti, Himanshu Singhal, Bobilli Sanyasi Rao, Vipul Arora, Suman Bagchi, Muhammad Tayyab, Mukund Kumar, Ranjana Rathore, Tirtha Mandal, Prasad Anant Naik, and Parshotam Dass Gupta

Raja Ramanna Centre for Advanced Technology, India

This article presents some of the recent experimental studies in ultra-high intensity laser-matter interaction, carried out at Raja Ramanna Centre for Advanced Technology, India, at laser intensities of ~$3x10^{18}$ and ~$5x10^{19}$ W/cm^2, using 0TW and 150 TWTi:sapphire laser systems.