CHINESE OPTICS LETTERS

Vol. 20, No. 10 | October 2022

Editorial of special issue on ultrafast optics: fundamentals and applications

Ultrafast optics is an interdisciplinary research area as the interface between physics, optics, photonics, chemistry and engineering. Currently, the cutting-edge research interests in this area include, but are not limited to, the development of frontier ultrafast lasers and their applications in photophysics, quantum science, nonlinear optics, light–matter interaction, and ultrafast dynamics. This special issue is a collection of selective research articles focusing on ultrafast laser sources, ultrafast imaging technique, and ultrafast dynamics in molecules and solid-state materials. Ongoing with this special issue, *Chinese Optics Letters* aims to continuously offer an active platform for communications on the latest progress in the field of ultrafast optics.

In Ref. [1], Zeng *et al.* designed an experimental system to implement high spatial resolution biological tissue imaging via optical parametric amplification (OPA) pumped with a vortex laser pulse. Imaging for biological tissues with high spatial resolution, high contrast, and high OPA gain in the second near-infrared region was realized.

In Ref. [2], Liu *et al.* reported the generation of a sub-30 fs pulse by using a hybrid cascaded nonlinear compression system. The initial pulse duration of 390 fs was compressed to 24.5 fs with the output energy of 1.6 μJ and a repetition rate of 500 kHz.

In Ref. [3], Chen *et al.* proposed a background-free all-optical chiral spectroscopy technique based on high harmonic generation.

In Ref. [4], Huang *et al.* theoretically demonstrated the factors affecting the dephasing in the molecular alignment and explained by taking advantage of the coherence of the rotational quantum state population.

In Ref. [5], Sugny showed the unexpected and counterintuitive possibility of simultaneously orienting a molecule while delocalizing its molecular axis in a plane orthogonal to the orientation direction.

In Ref. [6], Zhang *et al.* proposed a single-pulse pump probe method to detect the layer-dependent ultrafast carrier dynamics of WS_2, which can be divided into three stages, including the fast photoexcitation phase, the fast decay phase, and the slow decay phase.

In Ref. [7], Mainali *et al.* built some laser control strategies, such as interference and kicks, in full-dimensional funneling dynamics of the pyrazine.

In Ref. [8], Ran *et al.* experimentally investigated how the solvent polarity affects the aggregation behavior and photophysical process of a perylene diimide dimers (PDI-II) in solution.

In Ref. [9], Sun *et al.* observed a strong bandgap oscillation in the thin film of a two-dimensional D-J phase perovskite in transient absorption spectra. They revealed that the oscillation is caused by the transport of coherent longitudinal acoustic phonons in the film.

Prof. Shian Zhang, Guest Editor
East China Normal University, China
E-mail: sazhang@phy.ecnu.edu.cn

Prof. Olivier Faucher, Guest Editor
Université Bourgogne Franche-Comté, France
E-mail: olivier.faucher@u-bourgogne.fr

Prof. Shengye Jin, Guest Editor
Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China
E-mail: sjin@dicp.ac.cn

DOI: 10.3788/COL202220.100001

References

1. X. Zeng, C. Wang, Y. Cai, Q. Lin, X. Lu, J. Lin, X. Yuan, W. Cao, Y. Ai, and S. Xu, "High spatial-resolution biological tissue imaging in the second near-infrared region via optical parametric amplification pumped by an ultrafast vortex pulse [Invited]," Chin. Opt. Lett. **20**, 100003 (2022).
2. Y. Liu, B. Liu, Y. Song, and M. Hu, "Sub-30 fs Yb-fiber laser source based on a hybrid cascaded nonlinear compression approach," Chin. Opt. Lett. **20**, 100006 (2022).
3. Y. Chen, X. Zhu, P. Lan, and P. Lu, "Background-free detection of molecular chirality using a single-color beam [Invited]," Chin. Opt. Lett. **20**, 100004 (2022).
4. Y. Huang, G. Liu, and S. Xu, "Rotational dephasing of the molecular alignment by centrifugal distortion [Invited]," Chin. Opt. Lett. **20**, 100005 (2022).
5. D. Sugny, "Simultaneous field-free molecular orientation and planar delocalization by THz laser pulses [Invited]," Chin. Opt. Lett. **20**, 100008 (2022).
6. L. Zhang, J. Liu, H. Jiang, H. Gu, and S. Liu, "Layer-dependent photoexcited carrier dynamics of WS_2 observed using single pulse pump probe method," Chin. Opt. Lett. **20**, 100002 (2022).
7. S. Mainali, F. Gatti, and O. Atabek, "Laser control strategies in full dimensional funneling dynamics: the case of pyrazine [Invited]," Chin. Opt. Lett. **20**, 100007 (2022).
8. G. Ran, H. Wang, Y. Song, Y. Liu, Z. Bo, and W. Zhang, "Photoinduced excimer generation in perylene diimide dimer: effects of solvent polarity [Invited]," Chin. Opt. Lett. **20**, 100009 (2022).
9. F. Sun, B. Wu, and S. Jin, "Large bandgap oscillations in two-dimensional Dion–Jacobson phase perovskites caused by coherent longitudinal acoustic phonons [Invited]," Chin. Opt. Lett. **20**, 100010 (2022).