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Special Topic: Ultrafast Laser Machining and Measurement Techniques
•Editorial•

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Preface

Ultrafast lasers, specifically femtosecond lasers, possess unique properties that make them highly advantageous in microfabrication and ultrafast measurement. Their ability to generate incredibly high peak power and ultra-short pulse duration enables them to achieve high-precision fabrication and measurement. As a result, they are extensively utilized in fundamental research and practical applications. On the fundamental science side, femtosecond lasers-based ultrafast measurement techniques, like ultrafast spectroscopy, which investigates the ultrafast process of light-matter interaction, are valuable tools for fundamental science. This technology has been applied to various fields, including physics, chemistry, information, materials, energy, and the environment. For instance, it has been widely used to study complex phase transitions and charge transfer in optoelectronics. On the other hand, ultrafast laser fabrication has become a sophisticated optical processing technology with high accuracy that can be applied to a wide range of materials. It is particularly useful for processing materials that are difficult to handle using traditional methods, such as diamond and sapphire. The technology can also create complex three-dimensional microstructures, providing materials with novel optoelectronic properties. Therefore, it has become widely used in industry and scientific research.

We are pleased to present a special topic on "Ultrafast Laser Machining and Measurement Techniques", featuring contributions from young scholars at Tsinghua University, South China University of Technology, Jilin University, Hunan University, and other esteemed institutions. The special topic includes a total of 8 excellent articles and reviews. We express our gratitude to all the authors for their hard work and dedication in creating such insightful and informative pieces. We would also like to extend our thanks to the editorial and production staff for their efforts in ensuring the success of this special topic.

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