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### Experimental characterization and numerical simulation for ultrasonic-enhanced laser drilling/trepanning

Pulsed laser drilling/trepanning is widely used for high-precision high-efficiency microhole fabrication. However, a laser (e.g., a millisecond pulsed laser) itself usually cannot drill high quality holes due to recast layer formation. In this talk, a water-based ultrasonic-enhanced pulsed laser drilling/trepanning technique is accordingly reported to improve laser drilling performance. This cutting-edge technique is experimentally characterized and numerically analyzed, including experimental analysis for the influence of ultrasonic assistance on hole geometry, hole dimensions, recast layer formation, heat affected zone, microstructure and mechanical performance, also covering numerical analysis for the fields of temperature and residual stress resulting from laser drilling/trepanning. Effects of ultrasonic-laser parameters on laser drilling/trepanning efficiency and quality are also reported by comparing the drilled/trepanned holes without and using ultrasonic assistance.

### Biography

Houxiao Wang has completed his PhD in the year 2013 from Nanyang Technological University (NTU). He got the NTU Research Scholarship in 2008. He carried out collaboration with Institute of High Performance Computing in Singapore from 2009 to 2011. He is currently an Associate Professor/HOD of Jiangsu University. He has published more than 30 journal papers and has been serving as a Member of Optics and Photonics Society of Singapore, The Optical Society, and Materials Research Society of Singapore. He served as a Session Chair of the 12<sup>th</sup> Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR 2017), Singapore.

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