micromachines

IMPACT FACTOR 2.222

an Open Access Journal by MDPI

Pulsed Laser Micromachining

Guest Editor:

Prof. M. Cather Simpson
Department of Physics & School of Chemical Sciences, The Photon Factory, The University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

c.simpson@auckland.ac.nz

Deadline for manuscript submissions:
20 July 2019

Message from the Guest Editor

Almost since its invention, the laser has been used to cut and process materials—everything from dielectrics and metals to polymers and biomaterials. Laser micromachining offers significant advantages over many mechanical machining methods, mostly in processing quality and allowing ever smaller, more precise features. The advent of ultrashort pulsed lasers, with pulse durations on or faster than the ~1 picosecond time frame for coupling between electrons and phonons, opened a new regime of laser micromachining and microprocessing. These ultrashort pulses have been heralded for their ability to "cold cut" and reduce or eliminate the heat-affected zone around the ablation feature. The microprecision and feature quality can be extraordinarily good. Unfortunately, the limited energy carried by each ultrashort pulse means that micromachining with ultrashort pulses can be very slow—currently too slow for most industrial applications. This Special Issue will explore the current state-of-the-art in understanding and applying pulsed lasers to micromachine materials and to micro- and nanoprocess their surfaces. Contributions that explore fundamental mechanistic understandings for all pulse regimes as well as those that discuss applications will be welcomed. The topics to be covered include, but are not limited to the following: Pulsed laser micromachining; femtosecond laser micromachining; picosecond laser micromachining; nanosecond laser micromachining; CW laser micromachining; mechanism of laser ablation; laser ablation efficiency; micromachining with pulse bursts; micromachining with spatially-shaped beams; laser micropatterning; laser nanopatterning.

mdpi.com/si/19463