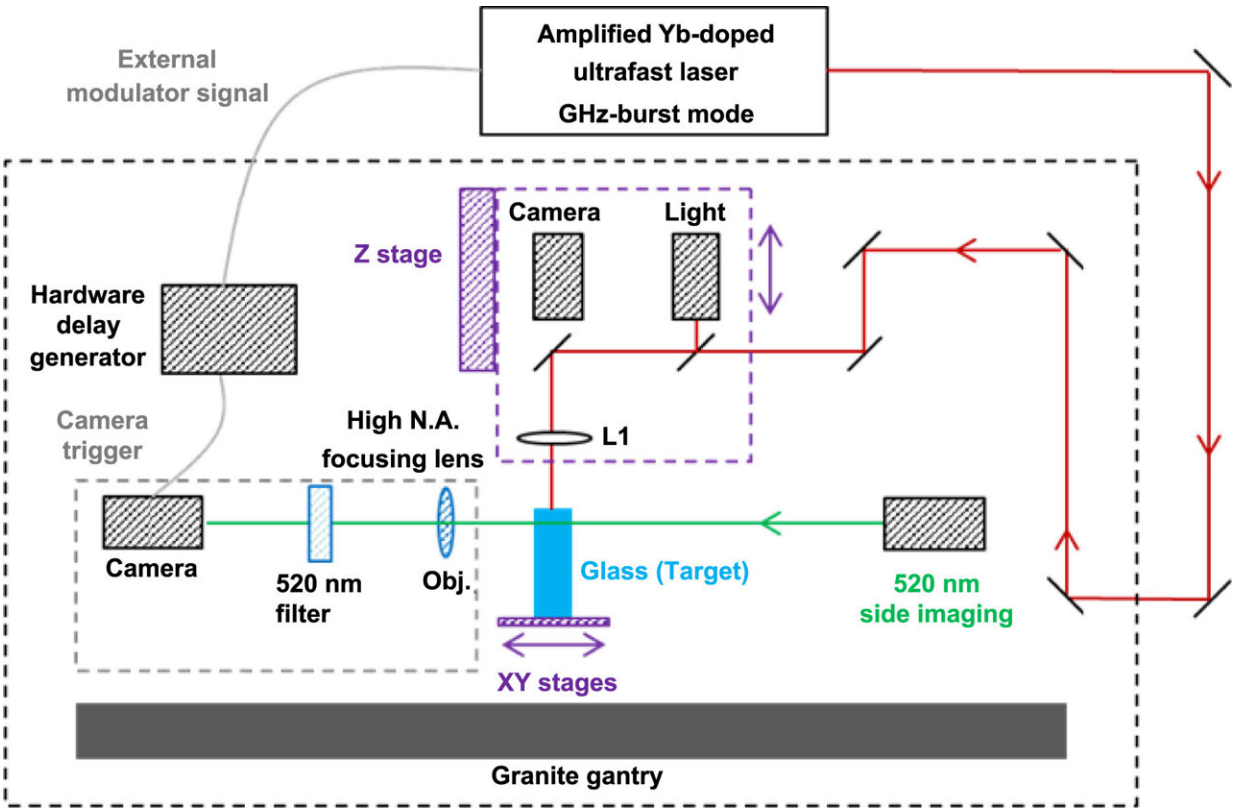


Exploring a new glass micro-drilling method using a femtosecond laser in GHz-burst mode

December 29 2022



Schematic of the experimental setup including a side-view imaging system. Credit: *International Journal of Extreme Manufacturing* (2022). DOI: 10.1088/2631-7990/aca14

The research group of laser-matter interaction at the Institute of Intense Lasers and Applications (CELIA) at the University of Bordeaux, France,

has explored a new glass micro-drilling method using a femtosecond laser in GHz-burst mode.

Publishing in the journal *International Journal of Extreme Manufacturing*, the research team used a femtosecond laser from Amplitude operating in the GHz-burst regime to study a new glass micromachining method which allows for drilling taper-free, elongated holes with smooth inner walls without any cracks in the glass. Usually, laser drilling with standard single femtosecond pulses results in tapered holes of strongly limited length and rough inner surface.

This new laser-matter interaction regime makes it possible to directly drill holes of high aspect ratio in one single step without any chemical etching. The choice of the [laser](#)-burst parameters was revealed to be very important in order to achieve an outstanding micromachining quality of the machined structures. The [femtosecond laser](#) GHz-burst mode could pave the way for new applications such as microelectronics where silicon interposers are likely to be replaced by glass interposers.

More information: Pierre Balage et al, Crack-free high-aspect ratio holes in glasses by top–down percussion drilling with infrared femtosecond laser GHz-bursts, *International Journal of Extreme Manufacturing* (2022). [DOI: 10.1088/2631-7990/aca14](https://doi.org/10.1088/2631-7990/aca14)

Provided by International Journal of Extreme Manufacturing

Citation: Exploring a new glass micro-drilling method using a femtosecond laser in GHz-burst mode (2022, December 29) retrieved 25 April 2024 from <https://techxplore.com/news/2022-12-exploring-glass-micro-drilling-method-femtosecond.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.