

# Investigation of Ablation of a Copper Surface Caused By 220 Nanosecond Laser Pulse

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## Abstract

This work investigates the material ablation of a copper surface by the irradiation of a 200 ns laser pulse. Our COMSOL Multiphysics® simulation is based on a FEM model with a deforming geometry using the according COMSOL interface, that takes the partly vaporization of the surface into account.

The Gauss shaped laser irradiation is treated as a surface heat source, which moves along with the copper surface. Our simulation calculates the energy transport by conduction inside the cylindrical bulk of copper with COMSOLs Heat Transfer Module; convective heat flux and surface emission in a surrounding air box is also taken into account.

Our work gains a better understanding of the influence of pulse length and spot size on the ablation volume. The results are validated by according experimental measurements of the ablation depth done with a solid state NIR high power fiber laser and according REM measurements of single pulse ablation.

## Figures used in the abstract

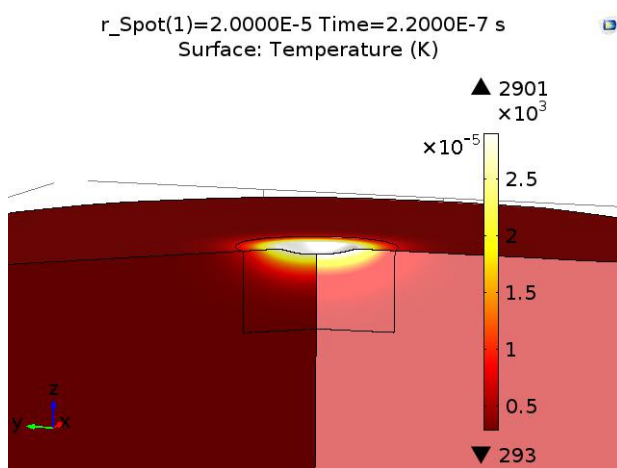


Figure 1

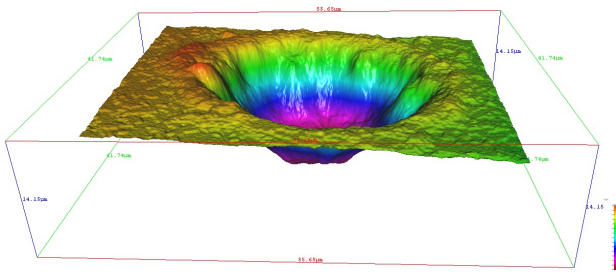


Figure 3