



## Photoionization effects under ultrashort laser processing of materials: Theory vs experiment

Nadezhda M. Bulgakova<sup>1\*</sup>, Inam Mirza<sup>1</sup>, and Alexander V. Bulgakov<sup>1</sup>

<sup>1</sup> FZU – Institute of Physics of the Czech Academy of Sciences, Na Slovance 1999/2, 182 00 Prague 8, Czech Republic

\*Corresponding author email: [nadezhda.bulgakova@fzu.cz](mailto:nadezhda.bulgakova@fzu.cz)

In the ultrashort laser processing of different materials on the surface and in the bulk, photoionization effects are of prime importance. This talk will overview the laser-induced formation of free-electron plasma and its consequences on the dynamics of ablation and volumetric modification of bandgap materials [1-4]. The connections between the thresholds and mechanisms of the damage and white-light generation upon femtosecond laser irradiation of wide-bandgap transparent materials will be considered based on comparisons between the comprehensive modeling and experimental data. The peculiarities of volumetric excitation of glass material by ultrashort spatiotemporally shaped laser pulses will be outlined. The advantages of dual-wavelength ablation and modification of semiconductors and dielectrics will be analyzed. Finally, the Coulomb explosion mechanism of ablation will be commented.

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