Thermal waves induced by ultrashort laser pulses in wide bandgap semiconductors

Alessandro Bellucci[1], Patrizia Dolce[2], Enzo Lucia[2], Matteo Mastellone[2], Donato Mollica[2], Stefano Orlando[2*], Andrea Orsini[1], Maria Lucia Pace[2], Fabrizio Pallotta[1], Antonio Santagata[2], and Daniele Maria Trucchi[1]

[1] CNR-ISM, 00016 Montelibretti (Roma), Italy
[2] CNR-ISM, 85050 Tito Scalo (PZ), Italy
[*]Corresponding author email: stefano.orlando@cnr.it

Ultrashort laser treatments have been performed in order to evaluate and understand the thermal diffusion phenomena which occur in the bulk and at the surface of wide bandgap semiconductors after the laser pulse incidence. The scope of the experiments was focused on the evaluation of the surface velocity of the thermal wave induced by the ultrashort laser pulses; the comparison of this surface thermal velocity with the bulk thermal velocity inside the samples has been surveyed. Real time 3ω method has been employed to derive the role played by the experimental parameters of both the material surface properties and the bulk thermal waves laser-induced features.