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Laser-induced ablation plasma: time and space-resolved spectroscopy. Applications

Wednesday, June 21, 2017 4:00 PM (1h 45m)

Laser produced plasma plumes created by nanosecond laser ablation on both metallic and complex weathering architectural objects were investigated through space-and time-resolved electrical and optical emission spectroscopy.
In order to describe the spatial and temporal evolution of the plasma parameters that define the dynamic of the laser produced plasma plume (electron temperature, expansion velocities and particle concentration) target physical properties and the effects of various pollutants on the studied objects have been studied. Different profiles of both transient laser ablation plasma plume parameters and physico-chemical transformations of the irradiated targets have been studied additionally by means COMSOL i.e. finite element analysis techniques. The method consists in a partial or an integral modeling of the studied physical process, using various experimental parameters and general formula and specific data base according to the studied materials. The simulations were focused on the spatial and temporal evolution for a series of plasma parameters and the effect of the external restrictions on the dynamics of the ablation plasma. The plasma parameters that describe the dynamic of the laser produced plasma plume were found to be dependent on the target physical properties.

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