Diploma thesis abstract

«Acoustic signal from plasma grating of femtosecond filaments»

Pankratov Vladislav Vladimirovich
Science advisor: Panov Nikolay Andreevich

We developed the physical model and numerical algorithm for the simulations of acoustic wave propagation from the source induced by femtosecond plasma grating relaxation in atmospheric air. The model is based on the wave equation with the wave velocity depending on the local temperature variation. The femtosecond plasma grating irradiates the superposition of two acoustic waves after plasma recombination. The first one is an isotropic cylindrical waveform with the characteristic spatial scale equal to the filament diameter ($100 - 200\ \mu m$) while the second is irradiated in the direction parallel to the plasma grating axis and has the spatial scale equal to the plasma grating period in the range $20 - 40\ \mu m$. Thus allowing to characterise the plasma grating noninvasively.