Phase control of the spatial distribution of ultrashort laser pulse field in periodic structures and at the output of multicore optical fibers.

Shumakova V.A.

Abstract: A new fiber based method for nonlinear-optical endoscopy with three dimensional spatial resolution was proposed and realized. A multicore fiber was proposed as a basis for the full-fiber endoscope. Phase control of femtosecond laser pulses spatial field waveform at the fiber`s distal end was realized experimentally. Capabilities of the full-fiber endoscope based on the multicore fiber were demonstrated in model experiments with macroscopic one-dimensional and two-dimensional periodic structures used for simulation of the multicore fiber output. Two-photon fluorescence microscopy in a two-dimensional periodic structure was implemented. Dependence of the endoscope characteristics on the parameters of the fiber was investigated. A method for monitoring phase distribution at the output end of the fiber with mechanical deformations of the fiber was proposed.

Scientific advisor
PhD Fedotov I.V.