Diploma thesis abstract

" numerical simulation of generation similariton pulses in active and passive fiber systems based in microstructure fibers."

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In this work we studied generation similariton pulses in active and passive fiber systems based in microstructure (MS) fibers. We realized numerical simulations generation similariton pulses extreme energy and pulse duration in fiber laser. The maximum energy of pulses was about 310nJ, and pulse duration was about 90fs after compression. We carried out analytical and numerical research of soliton spectrums evolution in MS fibers. We derive analytical relations for photon-number-conserving SSFS in a fiber with arbitrary frequency profiles of dispersion and Raman gain and show that these expressions provide an excellent agreement with the results of numerical simulations using the generalized nonlinear Schrödinger equation. We observed experimentally SSFS in MS fibers, and perform experiments, in which shifting solitons generated multifrequency third harmonic radiation.