

## **Diploma thesis abstract**

### **Role of plasma defocusing in filament formation and high-fluence energy transport by femtosecond laser pulse in air.**

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Numerically investigated influence of defocusing in the laser induced plasma on the process of limiting intensity growth and transport high-fluence energy by femtosecond filament in air.

Found that with an increase of the initial pulse duration at constant energy leads to increase of a high-fluence energy and its higher localization in filament. This is explained by the fact that the increase pulse duration at constant energy leads to weaker plasma defocusing, and as a consequence reduce the outflow energy to the periphery of the beam.

Shown that limiting the intensity growth during filamentation is not determined by equal zero of summary refractive index increment, as determined by the ratio of optical power of the near-axial non-linear lenses caused by the Kerr and plasma nonlinearities.