Nonlinear optics is constantly developing and in terms of future applications very perspective field of physics. With high-intensity pulsed lasers we are able to study interesting phenomena in matter that we cannot observe with common sources of light.

The aim of this thesis is a study of the multiphoton absorption of high-intensity pulses in diamond using z-scan technique. It theoretically describes this nonlinear phenomenon using quantum theory. The next section author took a measurement of the two-photon absorption and found the two-photon absorption coefficients in different samples.

Diamond was chosen as the sample material. This material has absolutely unique properties that rank it highly in future applications for optoelectronic devices.