

# ABSTRACT

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Title of diploma thesis: Measurement of changes in mechanical properties of human skin after application of therapeutic laser

This diploma thesis describes in the theoretical part the properties of human skin, the properties of laser radiation and the nature of interaction of laser radiation with human skin. The practical part deals with an *in vivo* measurement of changes in mechanical parameters of human skin after application of therapeutic laser radiation. The mechanical parameters of human skin were measured in ten volunteers before the application of laser radiation and then after the application. Used energy density of the laser radiation increased from 30 to 90 J·cm<sup>-2</sup>. The observed parameters were Hooke's coefficient, Newton's coefficient and the time constant. Hooke's coefficient describes the stiffness of the skin as a whole, Newton's coefficient characterises the viscosity of the skin, the time constant is the time in which skin returns to the original state after deformation. For measurement of those parameters was used dynamic elastometer.

It was found out that the changes of Hooke's and Newton's coefficient had increased immediately after the application of the therapeutic laser radiation with the wave length of 830 nm, the power of 188 mW and the energy density of laser radiation from 30 to 90 J·cm<sup>-2</sup>. An increase of the time constant was not proved. The changes in Hooke's and Newton's coefficient and in the time constant aren't statistically significantly different in reliance to the applied energy density of the laser radiation.