

## **Diploma thesis abstract by Rumiantsev Yuri**

### **Temperature dependence of refraction index and absorption factor dynamics of azobenzene containing polymer layer**

This diploma paper work features temperature dependence of refraction index and absorption factor dynamics of azobenzene containing polymer layer. This dynamics have been measured within temperature range from 25 °C to 70 °C. It has been pointed out that as the temperature goes higher the significance of diffusion processes, that tend to disorientate molecule distribution, grows, and the impact of laser radiation on substance in question diminishes. Basing on model of interaction of laser radiation with thin film of azobenzene containing polymer, a new model of interaction of light with thick layer of azobenzene containing polymer has been developed, where absorption of pump beam must be taken into consideration. Basing on this model and experimental results the absorption cross-sections of trans and cis isomers and rotary diffusion factor of trans isomers have been calculated.

The diffraction efficiency of induced grating has been experimentally investigated. The diffraction efficiency is oscillating in time, due to energy swap between straight and diffracted beams.

The speckle picture of scattered light field has been recorded with CCD camera. It has been shown that the autocorrelation function of scattered light is Fourier image of intensity distribution of pump beam, which corresponds with scattering on small statistically independent dissimilarities.

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