

TRANSIENT ABSORPTION
OF GOLD NANORODS INDUCED
BY FEMTOSECOND LASER IRRADIATION

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S u m m a r y

The action of femtosecond laser irradiation on the optical absorption of gold nanorods has been measured by the pump-probe technique in spectral regions of the longitudinal and transverse modes of surface plasmons. The evolution of the parameters of plasmon absorption bands, namely, peak positions and band widths, after the impact of a pump pulse on a water suspension of nanorods has been revealed by the advanced data processing, accounting for a chirp of the “white continuum” of a probe pulse. The observed kinetics fits the hot electron relaxation theory. In addition, a significant increase of the cross-phase modulation in the spectral range of the surface plasmon absorption band has been found. The irreversible nanorod shape transformation (a change of the aspect ratio) has been observed after long-term irradiation. Pump-probe measurements were performed at the Center for collective use of equipment “Femtosecond Laser Complex” of National Academy of Sciences of Ukraine.