

Systematic Study of LED Stimulated Recovery of Radiation Damage in Optical Materials

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The radiation damage in optical materials, mostly manifest as the loss of optical transmission, recovers to some extent in the presence of natural light, and at a faster rate in the presence of stimulating light. On the other hand, the systematic study of the dynamics of the recovery as a function of the stimulating light parameters such as its wavelength, intensity and exposure duration and method has not been performed in detail.

We established an LED recovery station which provides pulsed and continuous light at various wavelengths at custom geometries. The study starts with the irradiation of optical samples at various gamma doses at a rate of 87.5 Gy/min. The optical transmittance of the samples are then measured in 200 nm - 2000 nm range for an extended period of time.

Here we report on the details of the irradiation and recovery setups, and the results of recovery from radiation damage under different light exposure mechanisms.

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