

Impact of UV pulsed laser radiation and of the electron flow on dielectric states of polymer composite nanomaterial based on LDPE matrix

© *N.M. Ushakov*², *I.D. Kosobudskii*^{1,2}

¹ Gagarin Technical State University,
410054 Saratov, Russia

² Kotel'nikov Institute of Radio Engineering and Electronics, Saratov Branch of Russian Academy of Sciences,
410019 Saratov, Russia

E-mail: nmu@bk.ru

The influence of the soft electron flow and irradiating pulsed UV laser on dielectric states of polymer composite nanomaterial based on LDPE matrix is experimentally studied. It was shown that irradiation of the samples LDPE–ZnO by electron beam (10 keV) for 10–15 minutes gives rise the appearance of the horizontal portion of the temperature dependence of capacitance (permittivity) and to memory effect (slow relaxation of dielectric situation within a few days). Irradiation with pulsed UV laser of the LDPE–CdS sample allows you to switch into a conducting state and return it to their original state upon application of a weak electric field. The observed phenomena may find practical applications for the polymer electronic memories and switching devices.

Acknowledgement

The authors are grateful to Dr. Ul'zutuev A.N. and Dr. Podvigalkin V.Ya. for assistance in the experimental studies.