Stress-induced traps in multilayered structures

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Abstract

The trap parameters of defects in Si/CaF$_2$ multilayered structures were determined from the analysis of optical charging spectroscopy measurements. Two kinds of maxima were observed. Some of them were rather broad, corresponding to "normal" traps, while the others, very sharp, were attributed to stress-induced traps. A procedure of optimal linear smoothing the noisy experimental data has been developed and applied. This procedure is based on finding the minimal value of the relative error with respect to the value of the smoothing window. In order to obtain a better accuracy for the description of the trapping-detrapping process, a Gaussian temperature dependence of the capture cross-sections characterizing the stress-induced traps was introduced. Both the normal and the stress-induced traps have been characterized, including some previously considered as only noise features. ©2011 American Institute of Physics.