

BASIC KINETIC MODEL FOR X-RAY
CONDUCTIVITY IN WIDE-GAP
SEMICONDUCTORS

V. Ya. Degoda, A. O. Sofienko

Taras Shevchenko National University of Kyiv,
Faculty of Physics
(2, Academician Glushkov Ave., Bld. 1, Kyiv 03127,
Ukraine; e-mail: degoda@univ.kiev.ua)

S u m m a r y

A logical scheme for the development of a basic kinetic theory of X-ray conductivity in semiconductors has been proposed. It includes the calculation of spatial distributions of free charge carriers at successive time moments and uses the model of diffusion-driven drift motion of free charge carriers in a solid. An analytic expression for the basic shape of a current pulse in the external circuit has been obtained in the case of ideal semiconductor, i.e., when it does not contain deep traps and recombination centers. Basic dependences of the current pulse shape on the coordinate of an X-ray quantum absorption event and the strength of an applied electric field have been obtained.