Abstracts

Nuclear Radiation Perturbation of a Semiconductor-Filled Microwave Cavity

The perturbation of a semiconductor-filled microwave cavity by nuclear radiation particles is considered as a possible means of radiation counting. The TE/sub r/ mode equations for a spherical cavity are summarized, and the charge diffusion-recombination equation is solved for this spherical geometry. The case of a spherical cavity operating in the TE/sub 011/ mode, with the charge ionization occurring at the center, is analyzed. Through the utilization of a semisteady-state approach, a normalized expression for the power change as a function of time is obtained. This quantitative description for the output pulse shape is applied to the case of high-purity CdS at a frequency of 46.5 Gc/s. These results are presented in an accompanying figure.

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