

### A New Pulsed Pyroelectric Radiation Dosimeter

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We describe a new type of radiation dosimeter for the diagnostic X-ray region using a pyroelectric detector. The pulsed pyroelectric radiation dosimeter (PPERD) is a system constituted by a X-ray beam commutator, a pyroelectric chamber, a pre-amplifier and an electronic peak detector. The pyroelectric chamber consists basically of a lead zirconium titanate (PZT) ceramic (17 mm x 17 mm and 3 mm thick) on a nylon support. The chamber is evacuated to about 1 mm Hg. The thickness of the detector is such that it absorbed more than 99% of the X-ray beam used in these studies.

The pyroelectric element itself absorbs a X-ray pulse and provides a voltage proportional to the energy absorbed. The PPERD has the following characteristics for diagnostic X-ray beams: 1) It responds linearly to the radiation intensity for a given radiation spectrum; 2) It responds linearly to the radiation energy fluence rate; 3) The pyroelectric chamber is simple to construct, inexpensive and rugged; 4) The lower detection limit of energy fluence rate range and of exposure rate range are respectively  $20 \text{ mW/m}^2$  and  $9.0 \cdot 10^{-5} \text{ C.Kg}^{-1}\text{s}^{-1}$  (35 mR/s).

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