

CONTROL SYSTEM OF SCANNING ELECTRON PULSED BEAM FOR INDUSTRIAL LINAC

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This paper describes a control system of scanning electron and bremsstrahlung pulsed beam for industrial linac. A system carried out continuous, nondistorting, and high-informative monitoring of the extensive area under pulsed radiation. The system uses the ultrasonic emission, generated by the beam in thin rods and plates, as a source of primary information about the current status of characteristics of each electron/bremsstrahlung pulse. The hardware includes thermoacoustic dosimeters on the base of thin rods and plates, a set of acoustic sensors, beam monitoring subsystem, scanner control subsystem, which are connected to an accelerator control system, synchronization module, and IBM-compatible PC with corresponding software. The developed system permit measuring the following integral and differential characteristics of the beam: the intensity, the spatial beam disposition on a target, beam size and the operation time of the beam, the beam current history, the longitudinal and transverse distribution of beam particles, the energy characteristics, the spatial profile of radiation field. The system also allows varying according to predetermined law the spatial profile of a radiation field on the target with extensive area. The results of the uniform radiation field formation are discussed.