# On the possibility of preliminary estimation of the time resolution of pulsed ionizing radiation detectors using the SARMA-300 flaw detector

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The time resolution of pulsed ionizing radiation detectors is defined by the duration of the detector impulse response to a delta radiation pulse and characterizes the ability of the detector to register fast transient radiation processes.
This work presents a methodology for the registration and processing of the impulse response obtained using a diamond detector with a subnanosecond response time and a reference measuring instrument, the SAD1M diamond dosimeter, which has high sensitivity and deliberately lower time resolution. A pulsed x-ray flaw detector, SARMA-300, and a powerful ultrashort-pulse laser producing bremsstrahlung radiation were used as sources of ionizing radiation. Radiation pulses generated by the SARMA-300 flaw detector were experimentally recorded using the diamond detector and SAD1M detectors. It was shown that the detector output signal contains contributions from both bremsstrahlung and characteristic radiation of the x-ray tube anode, leading to an increase in the impulse response duration and distortion of its temporal shape.
Based upon the obtained results, a methodology for the preliminary estimation of the time resolution of the detectors is proposed. The method is based on simultaneous registration of the impulse responses of a reference detector and a detector under development to the radiation of the SARMA-300 flaw detector, followed by signal processing using convolution.