

Compact x-ray spectrometer based on thermoluminescent detectors

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Single-channel compact noise-proof spectrometer (\varnothing 5x10 mm) is based on the absorption filter method. Spectrometer is an assembly of thermoluminescent detectors made of lithium fluoride LiF, that are placed one after another, which are also used as filters for X-ray spectrum selection. Spectrometer has been developed for measuring X-ray spectra of micropinch-discharge plasma in the energy range of 1–25 keV. The thermoluminescent LiF detectors are most attractive for use in plasma diagnostics. The thermoluminescent LiF detectors are immune to electromagnetic interference, practically insensitive to ultraviolet radiation, and do not have a dead surface layer; at the same time, their response is linear in a wide dynamic range of the absorbed radiation dose (from 20 mSv to 10 Sv). The calibration measurements and test tests demonstrated the good operability and reliability of the compact spectrometer based on the array of thermoluminescent LiF detectors. The basic experimental results obtained in the investigation of the X-ray spectra of plasma objects are presented.

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