x-ray emission in experiments with additional heating at the GDT facility[[1]](#footnote-1)\*)

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The Gas Dynamic Trap (GDT) facility is used to carry out experiments with additional plasma heating using microwave injection. The report presents data on the registration of X-ray radiation in these experiments.

Detectors based on scintillators and photomultipliers were used as recorders. The detectors are located outside the GDT vacuum vessel and are sensitive to fast neutrons and X-ray (gamma-ray) . The detectors operate in current mode and record the time evolution of the X-ray emission intensity. Additionally, a stilbene-based spectrometer of neutrons and gammas is used in the work, which makes it possible to estimate the energy of X-rays.

It was found that in experiments with additional microwave heating on the GDT (in some reegime), a population of superheated electrons with energies from 100 keV to 500 keV is formed. When such electrons interact with limiters, powerful bursts of X-ray radiation arise, the time evolution of which was studied in this work.

A series of experiments was carried out at the GDT facility to create a target plasma by injecting an electron beam with an energy of 25 keV into a gas. As a result, a plasma is formed with a concentration of 5 10 12 cm-3 and a temperature of 20 eV. It is sufficient for capturing powerful atomic beams. In such experiments, a population of superheated electrons with energies above 100 keV is also formed. Such electrons hit the surfaces of limiters and generate bursts of powerful X-ray radiation. A spectrometer based on a stilbene scintillator was used to measure the time evolution of the spectrum of such radiation.

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVIII/Mu/ru/AU-Pinzhenin.docx) [↑](#footnote-ref-1)