OPTIMIZATION OF COLLECTIVE THOMSON SCATTERING GEOMETRY IN open MAGNETIC TRAPS [[1]](#footnote-1)\*)

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Progress in the methods of confining high-temperature plasma in modern open magnetic traps and planning experiments on next-generation facilities have led to the need to transfer and adapt well-established methods for diagnosing toroidal plasma for use in large open systems. In [1], it was proposed to use the recording of the collective scattering spectra of millimeter radiation for diagnosing the distribution function of energetic ions in the largest operating open magnetic trap, the GDT facility, which operates at the INP SB RAS. The proposed diagnostic system was created and the first experimental results were obtained [2].

The proposed and implemented scheme assumed the scattering of 54.7 GHz weakly refractive O-wave Gaussian beams. This did not allow us to take full advantage of the transition to a lower frequency to obtain a gain in the intensity of the scattered signal. In addition, the large size of the region from which the scattered signal is received did not allow one to analyze the distribution of energetic ions in the cross section of the trap.

In this paper, we discuss alternative schemes for inputting probing radiation and receiving scattered radiation, in which, due to strong refraction, it is possible to increase both the intensity of scattered radiation and the localization of the scattering region in the radial direction.

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References

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2. Shalashov A. G., et al. Phys. Plasmas, 2022, 29, 080702.
1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/Mu/ru/BZ-Gospodchikov.docx) [↑](#footnote-ref-1)