JUSTIFICATION OF THE POSSIBILITY OF APPLICATION cOLLECTIVE THomson scattering diagnostic on t-15md tokamak using gyrotrons [[1]](#footnote-1)\*)

DOI: 10.34854/ICPAF.2022.49.1.063

Pimenov I.S.

NRC «Kurchatov Institute»,1 Akademika Kurchatova pl., Moscow, 123182, Russia, [pimenowigor@mail.ru](mailto:pimenowigor@mail.ru)

Eight gyrotrons are in plan to use for Electron-Cyclotron Heating (ECH) plasma on T-15MD tokamak. In addition to the main task gyrotrons could be used also for diagnostic purposes. Collective Thomson Scattering (CTS) diagnostic in tokamaks and stellarators use gyrotron radiation to obtain physical data about ion component of plasma. Unlike standard diagnostic Thomson Scattering, where scattering occurs at individual electrons, in case of CTS, scattering appears on fluctuation electron density caused by ions motion. CTS allows to obtain one dimensional ions distribution function, ion temperature and isotopic composition. CTS is applied on tokamaks   
JET [1], TEXTOR [2], Asdex Upgrade [3] and also on stellarators LHD [4] and W-7X[5]. The main goal of this prezentation is justification of realization CTS on T-15MD tokamak. In this work the next aspects will be considered concerning this diagnostic:

1. Comparison with other diagnostics
2. Area of applicability
3. Space-time resolution
4. Various schemes of input radiation
5. Selection of optimal gyrotron frequency

References

1. H. Bindslev, J.A. Hoekzema, J. Egedal et al, Phys. Rev. Lett. 83, 3206 (1999)
2. H. Bindslev, S.K. Nielsen, L. Porte et al, Phys. Rev. Lett. 97, 205005 (2006)
3. M. Stejner, J. Rasmussen, S.K. Nielsen et al, Plasma Phys. Contrl. Fusion 59 (2017) 075009
4. S. Kubo, M. Nishiura, K. Tanaka et al, Pl. and Fus. Res.: Reg. Articles, volume 5, S1038 (2010)
5. D. Moseev, M. Stejner, T. Stange et al, Rev. Sci. Instrum. 90 (2019) 013503

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