GAm at the plasma periphery of the T-10 tokamak [[1]](#footnote-1)\*)

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Zonal flows and geodesic acoustic modes (GAMs) as their high-frequency counterpart influence transport processes in tokamak plasmas through interacting with broadband turbulence [1]. GAM in T-10 tokamak plasmas has three frequency peaks: low frequency (LF) satellite, main peak and high frequency (HF) satellite [2]. Each peak interacts with individual frequensy diapason of broadband turbulense with three-wave mechanism [3]. It is known, that in T-10 tokamak plasmas periphery (ρ > 0.87) main peak amplitude lowers to the noise level [4].

The present research is focused on studying of frequency structure of GAM on the periphery (ρ ~ 0.9) of the plasmas using spectral and bicoherent analysis of data, received from heavy ion beam probe [5] in the regime (Ipl = 230 kA, Bt = 2.3 T, ne ~ 0.6‑0.7∙1019 m-3. Figure 1 shows comparison of spectrums of plasma potential oscillations, measured at different radiuses.

The current research states that at the plasma periphery of the T-10 tokamak LF-satellite can be observed separately from main peak and HF-satellite.

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References

1. Fujisawa A. et al, Experimental progress on zonal flow physics in toroidal plasmas, Nuclear Fusion 2007 **47** (10) S718-S726
2. Крохалев О.Д., Мельников А.В. Исследование частотной структуры геодезической акустической моды в плазме токамака Т-10. // Труды 63 всероссийской научной конференции МФТИ – 2020 – стр. 215-217
3. Krokhalev O.D., Melnikov A.V. Interaction of GAM and broadband turbulence in plasma of T-10 tokamak – 48 Zvenigorod international conference on plasma physics and controlled fusion, abstract series– ISBN 978-5-6042115-4-0 – 2021
4. Melnikov A.V. [et al] GAM and Broadband Turbulence Structure in OH and ECRH Plasmas in the T-10 Tokamak – Plasma and Fusion Research – 2018. – Т. 13 – С.3402109–3402109
5. Melnikov A.V. et al. Heavy ion beam probing – diagnostics to study potential and turbulence in toroidal plasmas // Nuclear Fusion 2017 **57** (6) 072004.

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