LONG-RANGE CORRELATIONS OF ELECTRIC POTENTIAL IN THE TJ-ii STELLARATOR PLASMAS EDGE [[1]](#footnote-1)\*)

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The phenomenon of turbulent particles transport across the confining magnetic field is currently one of the key one in the fusion plasma physics study. The theory predicts [1] that one of the mechanisms for suppressing small-scale turbulence could be zonal flows associated with toroidally and poloidally symmetric (*n=m=0*) oscillations of the radial electric field. Both low-frequency and high-frequency (GAM - geodesic acoustic mode) zonal flows are studied on many tokamaks and stellarators [2, 3, 4]. The study electric potential fluctuations in the TJ-II stellarator plasmas (Madrid, Spain) is carried out with Heavy Ion Beam Probe double diagnostics and two arrays of Langmuir Probes located in various toroidal cross-sections (see fig. 1).

Fig. 1 Location of HIBP and LP diagnostics on the TJ-II stellarator

In the low-density regime ⟨*ne*⟩ ≈ 0.5·1019 m-3 and ECR heating *PECRH* = 600 kW, two arrays of electric probes showed the radial extension presence of floating potential long-range correlations of the in the 0,85 < *ρ* < 0,95　diapason [5]. Long-range correlations of the electric potential, detected with double HIBP in a regime with a line-averaged density ⟨*ne*⟩ ≈ 0.5·1019 m-3 and an input power of *PECRH* = 220 kW, were identified as zonal flows [6].

This work is devoted to the cross-correlation analysis of electric potential fluctuations measured by toroidally separated arrays of LP and double HIBP diagnostics in a similar plasma scenario (density ⟨*ne*⟩ ≈ (0.4÷0.6) 1019 m-3, *PECRH* = 460 kW).

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