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TST-2球状トカマク装置におけるプラズマ周辺部乱流構造の計測
Two dimensional analysis of edge fluctuation on TST-2

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Study on turbulence transport is one of the most important research themes in fusion plasma community [1]. TST-2 is a medium size spherical tokamak device where we have good turnaround of experiments and flexible accessibility of Langmuir probes (LPs). In this study, we measured edge turbulence structures in ohmically heated plasmas with a number of Langmuir probes in TST-2. In previous work, a number of edge fluctuations have been observed in ohmically heated plasmas. Representative edge fluctuations are MHD oscillations around the frequency of 10 kHz and turbulence fluctuations in the frequency range of 60-100 kHz [2].

The cross-coherence between floating potentials (V_f s) measured with the two LPs (probe2 & probe3) toroidally and poloidally separated from each other was calculated. When two probes are connected along the same magnetic field line, the coherence maximizes. The coherence of this long range correlation oscillates at the MHD frequency.

In this poster, we will discuss the spatio-temporal development of the long range correlation and non-linear phenomena of the fluctuations. We found the profile of coherence propagates radially in accordance with MHD fluctuation.

Furthermore, we installed a new Langmuir probe to investigate stress tensor, toroidal flow and wave propagation. Before we proceed to the main experiment, we tested the difference of the signals with different shielding conditions of the probe tips.

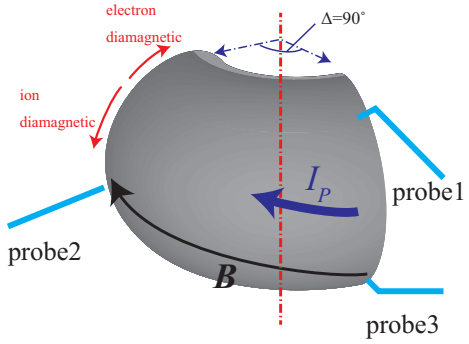

Fig.1：Schematic view of the Langmuir probes

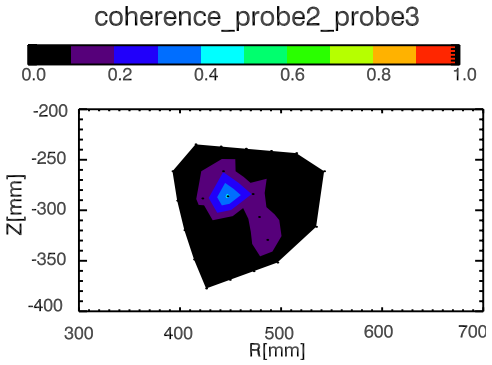

Fig.2 : Poloidal profile of the squared cross-coherence of V_f s at 60 kHz measured with probe2 and probe3 under the condition that the location of probe2 is fixed at R = 600 mm

[1] G.R. Tynan, A. Fujisawa, and G. McKee: Plasma Phys. Control. Fusion, **51**, (2009) 113001

[2] M. Sonehara, et al., IEEJ Transactions on Fundamentals and Materials **132** No.7 (2012) 499-504