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Accuracy of two points correlation length measurement and its applications in H-1NF heliac. JAEWOOK KIM, Korea Adv Inst of Sci Tech, C.A. MICHAEL, Australian National University, Canberra, A.C.T. 2601, Australia, Y.U. NAM, National Fusion Research Institute, M. LAMPERT, Wigner RCP, Y. C. GHIM, Korea Adv Inst of Sci Tech — Anomalous transport observed in fusion-grade plasmas is widely accepted to be correlated with spatial and temporal correlation characteristics of the turbulent eddies. While temporal and 2D spatial (radial and poloidal) correlation characteristics have been studied in detail, the lack of such information in the parallel direction, with respect to the background magnetic field, of hot core plasmas precludes us from full understanding and controlling plasma turbulence. KSTAR is equipped with a couple of 2D diagnostic systems measuring ion-scale density fluctuations, namely the BES and MIR systems, at two different toroidal locations. These systems provide a possibility to measure a parallel correlation length. As it is necessary to identify how reliably one can measure correlation length with only two spatial positions, there has been such a study [Jaewook Kim et al., Nucl. Fusion accepted] recently. Based on this recent study, we experimentally obtained 3D correlation functions from H-1NF heliac using the data from a set of Langmuir probes. One probe is spatially fixed, while the second one is scanned radially and poloidally at a different toroidal location. H1-NF heliac plasmas are highly reproducible, therefore we construct the 3D correlation functions with multi-discharges.

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