

Abstract Submitted  
for the DPP16 Meeting of  
The American Physical Society

**Probing of high-frequency coherent fluctuations by using a two-channel microwave reflectometer with antenna switching**<sup>1</sup> R. IKEZOE, M. ICHIMURA, J. ITAGAKI, M. HIRATA, S. SUMIDA, S. JANG, K. IZUMI, A. TANAKA, M. YOSHIKAWA, J. KOHAGURA, M. SAKAMOTO, Y. NAKASHIMA, Univ. of Tsukuba — A two-channel microwave reflectometer with capability of fast switching of microwave antennas in array was developed and applied to a hot linear plasma produced in GAMMA 10 to study the behavior of Alfvén waves in a collisionless bounded plasma. High-frequency fluctuations associated with Alfvén-ion-cyclotron (AIC) waves were successfully measured at multi points using this system. It is found that coherent phase fluctuations are obtainable at wide radial and axial region for the AIC waves. In addition, measured phase-difference profile clearly shows standing wave structures. Signature of movement of these nodes is also obtained. These results demonstrate applicability of the developed two-channel reflectometer for assessment of spatial structure of high-frequency waves and also verifies globally expanded coherent structure of the AIC waves in GAMMA 10. Two-point correlation analysis in conjunction with multi-point measurements using antenna switching turns out to be a powerful tool for investigating spatial structure of waves in a hot plasma where traditional solid probes are inadequate.

<sup>1</sup>This work was in part supported by Grant-in-Aid for Young Scientists (B) (15K17797) and Scientific Research (C) (25400531), and by Bidirectional Collaborative Research Program of NIFS (NIFS15KUGM101).

Ryuya Ikezoe  
Univ. of Tsukuba

Date submitted: 13 Jul 2016

Electronic form version 1.4