

## Observation of Energetic Particle Mode by Using Microwave Reflectometer

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The heterodyne reflectometer system [1] is utilized for the fluctuation measurement in the LHD. By using the extraordinary polarized wave, we can measure the corresponding value to the combined fluctuation with the electron density and the magnetic field in the plasma core region even if the radial electron density profile is flat. Currently the system has three channels of fixed frequencies of 78, 72, 65 GHz. Power combined three microwaves are traveling to/from the LHD by using a corrugated waveguide for avoiding the transmission loss. The simplified super heterodyne detection technique is used for the receiver system. Recently the real-time data acquisition system has been able to be utilized and the sampling rate is up to 10 MSample/sec by using a compact-PCI based digitizer. Then the system is very convenient to observe MHD phenomena such as energetic particle driven Alfvén eigenmodes [2], launching the extraordinary polarized wave. At the meeting we show the experimental result of the detailed behavior of the energetic particle mode when low- $n$  MHD burst is occurred. It seems to be caused that the spatial distribution of high energy particle is changed by such a MHD-burst.

[1] T. Tokuzawa *et al.*, 31st EPS Conf. P5-114 (2004)

[2] S. Yamamoto *et al.*, Nuclear Fusion **45**, 326 (2005)