

Density fluctuations measurement from fixed and sweeping microwave reflectometer during L-H transition on the COMPASS tokamak

O. Bogar^{1,2}, J. Zajac¹, M. Varavin¹

¹ *Institute of Plasma Physics, The Czech Academy of Sciences, Prague, Czech Republic*

² *Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava, Slovakia*

Microwave reflectometry is a versatile diagnostics that allows to perform both density profile and density fluctuation measurement. Fast sweeping reflectometry uses the O-mode polarization in frequency range 18-54 GHz. The sweeping time 6 μ s followed by 1.5 μ s of recovery time allows the density profile reconstruction from the frequency spectra with high temporal and spatial resolution. Fixed frequency measurement records the time evolution of the phase fluctuation at the plasma density layer given by probing frequency. IQ detection separates measurements of phase and amplitude of the reflected signal. IQ signal as well as IF signal is recorded at 200 Msamples/s. New dynamic calibration based on frequency marker and delay line technique was performed in order to suppress the frequency non-linearity at high sweeping rates. We investigate both the density fluctuation spectra and the fast density profile dynamics during the L-H transitions with varying discharge parameters. This contribution presents radial dependence of frequency spectra and radial profile of density fluctuation level from these two techniques.