Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

High frequency coherent mode measurement via density profile reflectometry in DIII-D[1] LEI ZENG, TERRY RHODES, TONY PEEBLES, KSHITISH BARADA, University of California, Los Angeles — High temporal ($\geq$25 μs) and spatial (˜3 mm) density profile reflectometer measurements not only provide routine electron density profile measurements, but also enable the study of fast (<10 kHz) density profile evolution during a variety of plasma conditions. The high frequency bandwidth ($\leq$ 30 MHz) of the reflectometer phase data allows high frequency coherent mode activity to be resolved in both space and time. For example, a tearing mode with frequency range of 10-100 kHz is observed to modify a spatially resolved region of the reflectometer phase signals. Using a phase based analysis rather than the analysis of the inverted density profile, the mode spatial distribution may be determined. The location of the induced phase perturbation is found to be consistent with ECE electron temperature measurements. Further analysis and comparisons will be presented to examine the validity of this new technique. Once validated, this analysis will enable improved physics studies of high frequency transient mode structure and time behavior.

[1]Work supported by USDOE Grants DE-SC0019352, DE-FG02- 08ER54984 and DE-FC02-04ER54698

Lei Zeng
University of California, Los Angeles

Date submitted: 03 Jul 2019 Electronic form version 1.4