Contribution ID : **280** Type : **not specified**

14.20 Radio Frequency Measurements of Energetic Particle Modes using the Ion Cyclotron Emission Diagnostic on the DIII-D tokamak

Thursday, 19 April 2018 10:31 (120)

The Ion Cyclotron Emission (ICE) diagnostic on the DIII-D tokamak advances our understanding of high-frequency energetic particles modes in the 5-200 MHz frequency range and motivates a possible similar ITER diagnostic. This diagnostic consists of ICRF antenna straps configured as receiving antennas and recently restored tile magnetic loop antennas, which have been used to collect a large set of radio frequency measurements in the 2015-17 run campaigns. Signals are digitized at 200 MSamples/sec for up to 5 seconds per discharge. The frequency response of the ICE antennas and differences between them will be described. Each shot typically yields 32 GB of data; techniques for successful handling and analysis of this challengingly large dataset will be discussed. The raw voltage fluctuations (<0.2 V and <1 mW) are analyzed in frequency space with FFTs and other tools within the OMFIT framework. In the case of the ICE modes, frequency is then mapped to real space with the aid of EFIT equilibrium reconstructions. This diagnostic has informed various energetic particle modes studies, including Compressional Alfven Eigenmodes (< 10 MHz), Ion Cyclotron Emission (5-25 MHz and higher harmonics), and whistler waves in the 100-200 MHz band. Work supported by US DOE under DE-FC02-04ER54698.

Primary author(s) : THOME, Kathreen (Oak Ridge Associated Universities)

Co-author(s) : PACE, David (General Atomics); PINSKER, Robert (General Atomics); DEL CASTILLO, Robert (Stony Brook University); ZHU, Yubao (University of California-Irvine)

Presenter(s) : THOME, Kathreen (Oak Ridge Associated Universities); PACE, David (General Atomics); PINSKER, Robert (General Atomics); DEL CASTILLO, Robert (Stony Brook University); ZHU, Yubao (University of California-Irvine)

Session Classification : Session #14. Thursday Morning Poster Session