Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Polarization measurements of post-disruption runaway electron synchrotron emission in DIII-D[1] Z. POPOVIC, E.M. HOLLMANN, UCSD, D. DEL-CASTILLO-NEGRETE, ORNL, I. BYKOV, R.A. MOYER, UCSD, J.L. HERFINDAL, D. SHIRAKI, ORNL, N.W. EIDIETIS, C. PAZ-SOLDAN, A. LVOVSKIY, GA — Visible synchrotron emission by runaway electrons (REs) has been studied with spectra and images to gain insight on RE dynamics and energy in several devices. RE pitch angle in post-disruption RE plateaus is important for radial transport loss of REs, current dissipation, and deposition of RE kinetic energy into the wall during final loss. A slow (˜100 ms) decrease of synchrotron brightness is usually observed during RE plateau, which is interpreted as dropping pitch angle for relativistic (>MeV) REs due to slowly evolving impurity content (and decreasing pitch angle scattering). If massive D2 injection is done, there is a more rapid purge of Ar out of RE plateau and a much faster drop of synchrotron brightness (˜20 ms). The brightness depends on pitch angle and RE density, so investigating polarization ratios (vertical/horizontal = Pz/Px) is a way of isolating pitch angle. Initial analysis indicates that the ratio depends on pitch angle. This is supported by drop in Pz/Px from ˜10 to about 3 during D2 MGI. The observation Pz/Px >1 is consistent with earlier observations [Tinguely 2019]. Comparisons of full orbit (KORC) and guiding center (SOFT) simulations of the polarization will be given.

[1]Work supported by US DOE under DE-FC02-04ER54698, DE-FG02-07ER54917, DE-AC05-00OR22725, DE-FG02-04ER54758, DE-AC52-07N27344, DE-FG03-95ER54309, DE-FG02-04ER54762, and DE-AC02-05CH11231

Zana Popovic
University of California, San Diego

Date submitted: 02 Jul 2020 Electronic form version 1.4