Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Disruption mitigation using symmetric dual shattered pellet injections in KSTAR J. KIM, NFRI, L. BAYLOR, ORNL, M. LEHNEN, IO, N. EIDIETIS, GA, S.H. PARK, J.H. JANG, NFRI, D. SHIRAKI, ORNL, A. AYDEMIR, K.P. KIM, K.C. LEE, NFRI, Y.C. GHIM, KAIST, G.S. YUN, POSTECH, K.S. LEE, J.W. JUHN, NFRI, D.G. LEE, KAIST, M.U. LEE, S. THATIPAMULA, POSTECH, H.S. HAN, NFRI, M. REINKE, J. HERFINDAL, ORNL, U. KRUEZI, IO — ITER adopts a strategy for evenly distributing radiated power during disruption mitigation and reduces the time to prepare pellets using multiple shattered pellet injections (SPI). However, as there was no device with a completely symmetric SPIs, sufficient studies have not been conducted on the effect of multiple injections. To confirm the feasibility of mitigation strategy in ITER, KSTAR installed two SPIs in toroidally opposite positions. We investigated the difference in the disruption mitigation by changing the arrival times of the two SPIs to assess the jitter effect among SPIs. The current quenching rate changes as the time difference changes from a few percent to tens of percent of the thermal quenching (TQ) duration. The results show that more energy can be released when multiple SPIs are injected simultaneously. For dual SPIs, the measured peak density is $1.2\text{x}10^{21}$ m^{-3} near the end of the TQ, which is almost twice the value of a single SPI. We will first focus on multiple injections of different toroidal locations as well as multiple barrel injections of the same poloidal and toroidal location. Through this, we plan to provide data that is the basis of ITER DMS design.

Jayhyun Kim
NFRI

Date submitted: 28 Jun 2020 Electronic form version 1.4