Abstract Submitted
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Research on Disruption Mitigation Enabled by Shattered Pellet Injection Systems on DIII-D, JET, and KSTAR in Support of ITER[1]
L.R. BAYLOR, S. MEITNER, T. GEBHART, D. SHIRAKI, J. HERFINDAL, J. CAUGHMAN, D. RASMUSSEN, ORNL, N. EIDIETIS, GA, E. HOLLMANN, I. BYKOV, UCSD, C. LASNIER, LLNL, J. WILSON, D. CRAVEN, M. FORTUNE, S. SILBURN, CCFE, A. PEACOCK, JET Exploitation Unit, S.H. PARK, J.H. KIM, K.P. KIM, NFRI, G. ELLWOOD, S. JACHMICH, U. KRUEZI, M. LEHNEN, A. MUIR, ITER Organization, JET COLLABORATORS TEAM — SPI cryogenic impurity injectors have been fabricated and installed for use in disruption mitigation and runaway electron dissipation experiments on DIII-D, JET and KSTAR. These systems are now all operational and being utilized in disruption mitigation research in support of ITER and are based on a 3-barrel design for flexible pellet size and variable pellet composition studies. We will present performance results of these SPI systems and describe how the systems are being used in experiments to study radiation symmetry during the thermal quench and forces encountered during the current quench as well as the interaction of injected material with runaway electron beams that may form during the current quench as a means of mitigating possible impact damage from the energetic electrons. Physics and operational lessons learned on propellant gas removal, multi-pellet synchronization, and radiation asymmetry using this technology and the impact on the ITER SPI based disruption mitigation system design will be described.

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