Abstract Submitted
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Identification and Study of MHD modes on NSTX using Soft X-ray Images[1] C.E. BUSH, Oak Ridge National Laboratory, B.C. STRATTON, J. ROBINSON, L.E. ZAKHAROV, E.D. FREDRICKSON, Princeton Plasma Physics Laboratory, D. STUTMAN, K. TRITZ, Johns Hopkins University — Theory and experiments indicate that MHD phenomena can cause significant fast particle losses which in turn lead to heating power loss and elevated wall power loading in present experiments and possibly future burning plasma devices. It is important for STs, ITER, and ITPA database scaling to understand the dominant MHD modes and their effects on fast particles. We have studied the spatial structure and time behavior of the MHD in NSTX using a unique fast soft x-ray imaging camera with a wide-angle (pinhole) tangential view of nearly the entire plasma minor cross section. The camera provides a 64x64 pixel image, on a CCD chip, of light resulting from conversion of soft x-rays incident on a phosphor to the visible. We have acquired plasma images at frame rates of 1-500 kHz (300 frames/shot), and have observed a variety of MHD phenomena: internal reconnection events, disruptions, sawteeth, fishbones, tearing modes, and ELMs. This is important to ITER due to fast particle (α's,etc.) losses. Modes with frequency > 90 kHz have been observed.

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