Abstract Submitted
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Investigation of fast ion mode nonlinear dynamics and spatial structure in NSTX[1] N.A. CROCKER, W.A. PEEBLES, S. KUBOTA, UCLA, E.D. FREDRICKSON, N.N. GORELENKOV, G.J. KRAMER, H. PARK, PPPL, W.W. HEIDBRINK, UCI, K.C. LEE, C.W. DOMIER, N.C. LUHMANN JR, UCD — Neutral beam heated plasmas in NSTX exhibit a rich spectrum of fast-ion driven coherent modes that includes fishbones as well as toroidicity-induced and compressional Alfvén eigenmodes (TAE and CAE). These modes are of significant interest because they can induce fast ion transport and channel fast ion energy into the plasma. In recent experiments, the spatial structure of fishbone density perturbations has been investigated through the simultaneous application of a 288 GHz radial interferometer and three fixed-frequency microwave reflectometers operated by UCLA, three tangential far-infrared interferometers operated by UCD and an array of magnetic sensing coils external to the plasma. The coils and the UCLA diagnostics have also been utilized in a similar investigation of TAEs. The results are compared with predictions from NOVA-K. Nonlinear three-wave interactions between fishbones, TAEs and CAEs are also studied. These interactions transfer energy in space and time and can significantly influence the effect of the modes on fast ions.

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