Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Kinetic excitation of Alfvénic instabilities near the second ballooning stability boundary in a high-β toroidal plasma[1] ANDREAS BIERWAGE, LIU CHEN, Department of Physics and Astronomy, University of California, Irvine, CA 92697, USA — The kinetic excitation and/or damping of plasma waves in a high-β tokamak plasma is studied using linear gyrokinetic simulations. A new code was developed to accurately simulate excitations in a broad range of frequencies and wavelengths. It describes the evolution of the electromagnetic fields $\delta\mathbf{B}_\perp$, $\delta B_\parallel$ and $\delta E_\parallel$ subject to effects of kinetic compression of thermal and energetic ions, finite Larmor radii and finite drift orbit widths. The s-α equilibrium model and ballooning representation are employed. For example, the code is capable of investigating kinetic ballooning modes, Alfvénic ion temperature gradient modes, β- and toroidicity-induced Alfvén eigenmodes, and energetic particle modes. Our current focus is on the parameter regime near the second ballooning stability boundary, where the properties of Alfvénic instabilities including kinetic thermal ion compression will be examined. Corresponding results will be reported as they become available.

[1]This research is supported by United States DOE and NSF Grants.

Andreas Bierwage
Department of Physics and Astronomy,
University of California, Irvine, CA 92697, USA

Date submitted: 23 Jul 2007 Electronic form version 1.4