

Abstract Submitted
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Mode conversion in ITER¹ E.F. JAEGER, L.A. BERRY, Oak Ridge National Laboratory, J.R. MYRA, Lodestar Research Corporation, SCIDAC CENTER FOR SIMULATION OF WAVE-PLASMA INTERACTIONS TEAM — Fast magnetosonic waves in the ion cyclotron range of frequencies (ICRF) can convert to much shorter wavelength modes such as ion Bernstein waves (IBW) and ion cyclotron waves (ICW) [1]. These modes are potentially useful for plasma control through the generation of localized currents and sheared flows. As part of the SciDAC Center for Simulation of Wave-Plasma Interactions project, the AORSA global-wave solver [2] has been ported to the new, dual-core Cray XT-3 (Jaguar) at ORNL where it demonstrates excellent scaling with the number of processors. Preliminary calculations using 4096 processors have allowed the first full-wave simulations of mode conversion in ITER. Mode conversion from the fast wave to the ICW is observed in mixtures of deuterium, tritium and helium3 at 53 MHz. The resulting flow velocity and electric field shear will be calculated.

[1] F.W. Perkins, Nucl. Fusion 17, 1197 (1977).

[2] E.F. Jaeger, L.A. Berry, J.R. Myra, et al., Phys. Rev. Lett. 90, 195001-1 (2003).

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