Abstract Submitted
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Simulation of High Power ICRF Wave Heating in the ITER Burning Plasma[1] E.F. JAEGER, L.A. BERRY, R.F. BARRETT, E.F. D'AZEVEDO, Oak Ridge National Laboratory, SCIDAC CENTER FOR SIMULATION OF WAVE-PLASMA INTERACTIONS TEAM — ITER relies on Ion-cyclotron Radio Frequency (ICRF) power to heat the plasma to fusion temperatures. To heat effectively, the waves must couple efficiently to the core plasma. Recent simulations using AORSA [1] on the 120 TF Cray XT-4 (Jaguar) at ORNL show that the waves propagate radially inward and are rapidly absorbed with little heating of the plasma edge. AORSA has achieved 87.5 trillion calculations per second (87.5 teraflops) on Jaguar, which is 73 percent of the system's theoretical peak. Three dimensional visualizations show "hot spots" near the antenna surface where the wave amplitude is high. AORSA simulations are also being used to study how to best use ICRF to drive plasma currents for optimizing ITER performance and pulse length. Results for Scenario 4 show a maximum current of 0.54 MA for 20 MW of power at 57 MHz. [1] E.F. Jaeger, L.A. Berry, E. D'Azevedo, *et al.*, Phys. Plasmas. **8**, 1573 (2001).

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