Abstract Submitted
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Tritium Minority Heating by Ion Bernstein Waves in Ignitor[1] C. CASTALDO, A. CARDINALI, ENEA — A promising scenario of minority heating of Tritium ions by Ion Bernstein Waves (IBW) coupled by mode conversion of fast waves in D(H) plasmas has been recently proposed.[2] The tritium ions are accelerated at energies high enough to increase significantly the DT fusion reactivity at relatively low temperature. It has been shown that breakeven can be reached considering a specific heating scenario for the JET machine. A similar heating scheme is analyzed for the Ignitor machine at reduced parameters. It is shown that 10 MW of ICRF power at $f = 91.6$ MHz, $N_{||} = 3.6$ that are coupled as fast waves to plasmas at $B_T = 9$ T, $I_p = 6$ MA, $n_{e0} = 2 \times 10^{20}$ m^{-3}, $T_{e0} = T_{i0} = 8$ keV, with 25% T, 40% D, 35% H concentration, are mode converted to IBW near the D-H hybrid resonant layer and are efficiently absorbed by tritium ions via cyclotron damping at $\omega = 2\Omega_T$. The tritium ions are accelerated at energies of the order of 100 keV, where the the DT fusion reactivity peaks. As a result about 50 MW/m^3 of peak fusion power are obtained, and the expected fusion power is about 30 MW, with $Q = 2$. The detailed comparison between equivalent scenarios in 50-50 D-T plasma is underway by means of the JETTO transport code.

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[2]C. Castaldo and A. Cardinali, *Phys. of Plasmas*, in press (2010)

B. Coppi
MIT

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