Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Optimal Equilibria and Plasma Parameter Evolutions for the Ignitor Experiment* A. AIROLDI, G. CENACCHI, IGNIR, B. COPPI, MIT — In view of the operation of the Ignitor machine in both the H and the I-regime, optimal equilibrium configurations that can sustain plasma currents I_p up to 10 MA with a double X-point have been identified. In fact, the emergence of the I-regime in double X-point configurations has not been observed experimentally yet. The characteristics of the magnetic equilibrium configurations that can be produced play a crucial role in the performance of the machine. Therefore, particular care has been devoted to the study of plasma equilibria relevant to the main phases of the discharge evolution. A series of simulations to be utilized for the control of the relevant (sub-ignited) plasma parameters has been carried out using the JETTO transport code considering different values of the plasma current and, correspondingly, of the magnetic field. Special attention has been devoted to non-igniting experiments with $I_p = 5$ MA and $B_T = 8$ T, where B_T is the toroidal magnetic field, as they can be performed with much better duty cycles and longer duration than experiments aimed at reaching the most extreme plasma parameters and ignition in particular. The results of the relevant analyses with a discussion of the adopted transport coefficients is presented. *Sponsored in part by ENEA and the U.S. DOE.

Bruno Coppi
MIT

Date submitted: 15 Jul 2011 Electronic form version 1.4