Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Disruption Studies and Simulations in Ignitor* G. RAMOGIDA, ENEA, F. VILLONE, Univ. Cassino - CREATE, G. RUBINACCI, Univ. Napoli - CREATE, B. COPPI, MIT — The prediction of plasma disruption features and evaluation of the associated EM loads played an important role in the development of Ignitor [1]. The kind and number of expected plasma disruptions drove the development of the plasma scenarios and the design of in-vessel components, as these events produced by far the largest EM loads the components must withstand. A strong integration of physics and engineering expertise was required to estimate the range of expected variation, based on the experimental data from existing machines, of the main parameters of the disruptions: thermal and current quench times, evolution of the plasma current, li, safety factor limits, halo current fraction and width, and radiated heat fraction. The MAXFEA axisymmetric 2D MHD code was used to evaluate the effects on the induced currents and EM loads caused by variation of the disruption parameters. Further, the detailed evolution of the plasma was simulated using the CarMa0NL code, which is able to self-consistently couple a nonlinear axisymmetric plasma evolution with volumetric 3D conductors. This allows the evaluation of the effects of the non-axisymmetric components of the machine such as the plasma chamber ports. *US DOE partly sponsored.

[1] B. Coppi, et al. *Nucl. Fus.* 53, 104013 (2013).

Bruno Coppi
MIT

Date submitted: 11 Jul 2014 Electronic form version 1.4