Abstract Submitted
for the APR05 Meeting of
The American Physical Society

Advances in the Ignitor Program[1] F. BOMBARDA, ENEA, B. COPPI, MIT, THE IGNITOR PROJECT TEAM — There have been significant advances both in finalizing the design of the Ignitor machine and in understanding the plasma physics regimes that the experiments by Ignitor are expected to cover. Among the former, there is a new configuration of the plasma chamber and a solution for the first wall (Molybdenum tiles and tile carriers), the optimization and simplification of the entire poloidal field system, the successful test of key components of a 4 km/s pellet injector, the completed construction of the second generation prototypes of the toroidal magnet plates, the definition of the power supply system. For the physics, the achievement by the Alcator C- –Mod machine of 2 MA plasmas at 8 T supports the expectation that Ignitor will attain 11 MA with consistent safety factors. A realistic form of control of the plasma temperature in view of the thermonuclear instability onset as ignition is approached, has been simulated by the JETTO 1+1/2 D transport code and consists in coordinating the value of the plasma density that influences strongly the plasma resistivity, and the ICRH system that is employed to keep the plasma slightly undercritical but yet with high values of Q. A study of Ignitor plasmas in a variety of regimes other than the reference ignition scenario has been carried out, showing that even without tritium and with Ohmic heating alone novel physical regimes can be attained, largely exceeding the results of present day devices.

[1]Supported in part by the US DOE and by ENEA and CNR of Italy

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Date submitted: 14 Jan 2005 Electronic form version 1.4