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Structural Analyses and Concept Developments and Physics for the Ignitor Program* A. BIANCHI, Ansaldo Nucleare, B. COPPI, MIT — The design of the Ignitor machine features high toroidal currents ($I_p \simeq 10$MA) and relatively small dimension $R_0 \simeq 1.32$m), with realistic values of the safety factor against the onset of macroscopic instability, involving record values of B_p the mean poloidal field. One of the near term developments is a novel optimized distribution of the cooling channels that has been fully analyzed and is presently included in the design of the toroidal magnet plates and the associated C-clamps [1]. This solution increases the duty cycle for the machine operating at full parameters by a factor of 2. A complete structural analysis of the plasma chamber, as presently designed, has been carried out identifying the limits on the numbers and the magnitudes of the disruptions that can be tolerated on the basis of well accepted criteria. Then a program of further activities concerning the overall structural design of the Ignitor core has been formulated. *Sponsored in part by the U.S. Department of Energy.

[1] B. Coppi et al., 2012 IAEA International Conference Fusion Energy, Paper OV/P-02 (Vienna, 2012) to be published in Nucl. Fus. (2013).

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