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Physics with Reduced Parameters by the Ignitor Experiment[1] G. CENACCHI, Associazione Euratom-ENEA sulla Fusione, Italy, A. AIROLDI, D. FARINA, CNR-IFP, Italy, B. COPPI, M.I.T. — The Ignitor experiment is designed to produce plasma currents up to 11 MA and magnetic fields up to 13 T [2], but its operational life will include "preparatory" discharges at reduced machine parameters that are expected to access significant plasma regimes. In this context a careful analysis has been carried out to verify the consistency of the plasma parameters to be obtained, in particular the ideal ignition conditions in D-T plasmas with considerable pulse lengths, with the characteristics of the poloidal and toroidal field systems. To this end many simulations were carried out by the JETTO code, that is capable of taking into account the evolution of relevant free-boundary plasma equilibria. Two scenarios with magnetic fields up to 9 T and appropriate levels of injected (RF) heating were investigated: "limiter" (no X-point) configurations with plasma currents up to 7 MA, and double X-point configurations with plasma currents up to 6 MA. Proper programming of the density evolution and of the RF injection lead to reach and to maintain steady state conditions with peak temperatures around 6 keV (ideal ignition for the considered profiles) and significant α-particle production. The relevant pulse flat-top length can be about 8 seconds.

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[2]B. Coppi, A. Airoldi, et al., *Nucl. Fusion* **41**, 1953 (2001)

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