Abstract Submitted
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The Columbus Concept in the Context of a Science Based Approach to Fusion Research[1] M. SALVETTI, B. COPPI, MIT — Exploring the physics of meaningful fusion burning plasmas by a spectrum of complementary experiments is a keystone of the Science First approach [1] to fusion research. The rationale for this approach is that the possible discovery of new phenomena and the understanding of known ones, in particular sawtooth oscillations, under fusion burning conditions will contribute to define the characteristics of future fusion reactors. Accordingly, we have progressed in the study of the Columbus experiment [2] that is designed to reach ignition conditions in D-T plasmas where the heating due to the produced α-particles compensates for all energy losses. Columbus adopts all the design criteria and solutions of the Ignitor device, but has increased dimensions ($R_0 \simeq 1.5$ m is the plasma torus major radius, $a \simeq 0.53$ m and $b \simeq 0.98$ m are the minor radii) and plasma currents $I_p \simeq 12.2$ MA that is the value that the ITER concept would produce for the same stability safety factor without, however, reaching ignition. Columbus is proposed for construction in the U.S. while Ignitor has been developed in Italy.
[1] B. Coppi, M.I.T.-RLE report PTP02/04 (2002), Presentation to the National Research Council.
[2] B. Coppi M. Salvetti, M.I.T.-RLE report PTP02/06 (2002).

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