Abstract Submitted
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The Columbus device[1] MATTEO SALVETTI, BRUNO COPPI, MIT
— The Columbus device [1] is proposed as one component of a spectrum of experiments needed to explore the physics of fusion burning plasmas. Columbus has a larger volume than Ignitor by about 50%, lower current densities in the magnet systems and capability to sustain longer plasma pulses. The machine preserves the ability to confine, under macroscopically stable conditions, plasmas with peak pressures exceeding 3 MPa, corresponding to ignition at central plasma densities around 10^{21} nuclei/m^3 and to reach this regime by ohmic heating alone. The presence of an ICRH system will expand the capabilities of the device. In our opinion, a spectrum of "Science First" devices is the only viable path to an efficient fusion program development and plasma ignition is an important milestone to be achieved before undertaking the construction of a Demo reactor requiring minimization of the external heating power. The Iter design envisages that about one third of its heating power be supplied from the outside in order to maintain its plasma pressure at the desired values. The Columbus program is proposed as a U.S. counterpart to the Ignitor project conducted in Italy and to be complementary to it. The machine costs can be minimized by incorporating the main engineering solutions devised for Ignitor. [1] Coppi,B. and Salvetti,M.,"*Highlights of the Columbus Concept*", M.I.T. Report, PTP02/06 (2002).

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