Novel Hybrid Reactor Concepts Based on Ignitor Technology and Physics*

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A development of the Ignitor program, aimed at making fusion energy of near term relevance, is that of starting from nuclear engineering, technology and physics advances, on which the Ignitor effort is based, to conceive novel hybrid reactors. High field compact machines have produced record high density plasmas with excellent confinement properties that can be utilized as neutron sources for power producing reactors with Thorium as its fissile component (E. P. Velikhov and B. Coppi, 2019). The Columbus concept [1], that had been studied as a follow-up to Ignitor in order to investigate the burn conditions of Tritium deprived plasmas, is being reconsidered as a neutron source to start with. Advances in relevant Molten Salt Reactor technology are followed in this context. Moreover, following a suggestion by C. Bolton (2020) the adoption of pure, or nearly pure, D plasmas for which the high field approach is appropriate is being analyzed together with relevant advances in materials science. *Sponsored in part by CNR-ISC of Italy.

[1] B. Coppi and M. Salvetti, MIT (RLE) Report PTP 02/06, December 2006.