Confinement Scalings, Compact High Field Experiments on Fusion Burning Plasmas and Relevant Superconducting Technology*

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The scalings that can be derived from the theory of the modes that are considered to be responsible for the transport properties of well confined plasmas and relevant experiments on plasmas with high degrees of purity indicate that the most promising approach is that of compact high field experiments capable of producing both high poloidal fields and high total plasma currents (e.g. 10 MA or higher).

The advancements made in the development of high field superconducting magnetic technology pioneered with the TRIAM 1 experiment and the Ignitor design [1] in which large MgB_2 superconducting coils have been introduced, lead to envision novel experiments that are not limited by the heating of the innermost copper coils of the presently designed high field machines. These include experiments aimed at reducing the role of Tritium in the meaningful fusion burning plasma regimes that can be produced. *Sponsored in part by the US DOE.

[1] B. Coppi, *et al. Nucl. Fus*., **55**, 053011 (2015).