Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Anomalous Transport Processes Including Self-organization for Fusion Burning Regimes* A. AIROLDI, G. CENACCHI, CREATE, P. DETRAGIACHE, ENEA, B. COPPI, MIT — A class of thermal energy transport models is adopted involving scalings for the relevant diffusion coefficients based on the dominant modes in high temperature plasma regimes and featuring radial profiles that reflect the presence of self-organization processes [1]. This is referred to as "profile consistency." One of these models is the C-T model (Coppi-Tang) used extensively to predict the plasma parameters and profiles for the ITER experiment [2]. A comparison of the results by this model with those obtained by previous analyses (e.g. involving the so called Bohm-gyro-Bohm models) is presented. The reference plasma evolution scenario involving the extreme parameters $B_T \simeq 13$ T and $I_p \simeq 11$ MA leads to achieving ignition with Ohmic heating only or with the additional contribution of modest amounts of ICRH heating. Scenarios that are less demanding for the machine but do not involve ignition have been considered as well. *Sponsored in part by the US DOE.

[1] B. Coppi, Comments Pl. Phys. Cont. Fus. 5, 6: 261-270 (1980).
[2] T.A. Kasper, W.H. Meyer et al. Nucl. Fus. 51, 013001 (2011).

Bruno Coppi
MIT

Date submitted: 10 Jul 2013 Electronic form version 1.4