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Importance and Unpredictability of Self-organization Processes in Fusion Burning Plasmas B. COPPI, MIT, V. RICCI, R. SPIGLER, A. CARDINALI, CNR of Italy — Self-organization processes are considered to have an important role in well confined plasmas produced by present day experiments where the heating source is externally applied. The observation of "Profile Consistency" [1] is viewed as a manifestation of the presence of these processes. In the case of fusion burning plasmas close to self-sustainment (ignition) most of the heating due to fusion products is strongly dependent on the evolution of both the plasma temperature and density profiles. Therefore, self-organization is expected to be of considerably greater importance than in the case of non-reacting plasmas. This fact involves a significant degree of unpredictability on the outcome of envisioned experiments on burning plasmas that has to be added to the complexity of the collective modes that are expected to emerge. Thus, one of the motivations for the Ignitor program is to shed light on these issues and minimize the uncertainties for the design of more ambitious undertakings such as a Compact Pilot Plant. *Sponsored in part by CNR of Italy. [1] B. Coppi, Comm. Plasma Phys. Cont. Fusion **5**, 261 (1980).

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