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Mitigation of the Thermonuclear Instability by Low-Power ICRH Minority Heating in Ignitor[1] A. CARDINALI, ENEA; Italy, B. COPPI, MIT — The expected ability of Ignitor to achieve ignition with high peak densities ($n_0 \cong 10^{21}\mathrm{m}^{-3}$) and relatively low temperatures makes it possible to investigate the thermonuclear instability that can develop in these regimes. As a consequence of the instability, self-heating of the plasma by the fusion produced α-particles can lead to a significant rise of the plasma temperature and, with this, to an increase of its pressure. Then, internal plasma modes may be excited and saturate the thermonuclear instability at acceptable levels without external intervention. In the case where an internal process may not be effective, a scenario is considered whereby Ignitor is led to operate in a slightly subcritical regime, i.e. the plasma parameters are so chosen that the thermonuclear heating power is slightly less than the power lost, and a small fraction of ^{3}He is added to the optimal Deuterium-Tritium mixture. The difference between power lost and α-heating is compensated by additional ICRH heating, which should be able to energize the minority species (minority heating) directly, which can transfer the power to the main plasma species by collisions. Other options to control the thermonuclear instability are discussed.

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