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Plasma Radiation Cooling in the Ignitor Experiments* E. GAMBOA, M.I.T., F. BOMBARDA, ENEA, Italy — The Ignitor experiment is designed to reach ignition at relatively low temperatures ($T_e \cong T_i \cong 11$ keV) and high densities ($n_0 \cong 10^{21}$ m^{-3}). Under these conditions the plasma parameters at the edge are such that the estimated thermal loads on the molybdenum first wall are everywhere relatively modest, thanks to the high fraction of power radiated by the plasma main species and by the small amounts of impurities trapped in the edge region. In the reference ohmic ignition scenario this fraction is expected to amount to more than 70% of the total power. The respective roles of the radiation emitted by the core and by the edge of the plasma column is analyzed as a function of plasma parameters, impurity fraction, impurity spatial distribution, and atomic species. The present analysis supports the original results[1] that led to choose a "limiter configuration" for Ignitor instead of a "divertor" one, with all the consequent benefits deriving from a more efficient use of the volume available inside the magnet's bore, and by using a high Z material for the first wall tiles. The non-functionality of divertors in high density plasma regimes has been highlighted also by experiments carried out on the Alcator C-Mod machine[2]
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[1]C. Ferro et al., ENEA Report RT/ERG/FUS/94/14, Italy (1994)
[2]B. LaBombard et al., *Nucl. Fusion* **40**, 2041 (2000)

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