Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Plasma Position Diagnostics for the Ignitor Experiment[1] G. PIZZICAROLI, F. ALLADIO, F. BOMBARDA, ENEA - Italy, A. LICCIULLI, M. FERSINI, Università di Lecce, Italy, D. DISO, Salentec, Italy, E. PAULICELLI, Università di Bari, Italy — Prototype coils of the electromagnetic diagnostics for the Ignitor experiment have been manufactured adopting innovative methods to improve the ceramic insulator resilience to neutron and gamma radiation. Thus, real time plasma position measurements should be possible over a broader range of high performance plasma regimes with D-D and D-T fuel. An alternative method is under study to provide the necessary spatial information also at the highest parameters that the Ignitor experiment can achieve ($B_T \simeq 13$ T, $I_p \simeq 11$ MA, neutron yield$\simeq 3 \times 10^{19}$ n/s), where the electromagnetic diagnostics may fail. The new instrument is based on the diffraction and detection of the soft X-ray radiation emitted at the plasma edge. Gas Electron Multiplier (GEM) detectors are considered as the best candidates to provide signals with high counting rates (>1 MHz) and high S/N ratios, to be used by the control system[2]. A curved Multilayer Mirror placed inside one of the equatorial ports will diffract the radiation onto a properly shielded GEM detector that is located outside the machine vacuum and not in direct view of the plasma.

[1]Sponsored in part by ENEA of Italy and by the U.S. D.O.E.
[2]D. Pacella, et al, *Nucl. Instr. Meth. A* **508**, 414 (2003)

Francesca Bombarda
ENEA - Italy

Date submitted: 25 Jul 2007 Electronic form version 1.4