

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**Vertical Control for Burning Plasmas in Ignitor**<sup>1</sup> F. VILLONE, G. RUBINACCI, CREATE, Italy, F. BOMBARDA, G. RAMOGIDA, ENEA, Italy — The vertical position and shape controller for Ignitor has been designed on the basis of the CREATE\_L linearized plasma response model,<sup>2</sup> which assumes an axisymmetric system and describes the electromagnetic interaction of the plasma with the surrounding structures by a small number of global parameters (i.e.,  $\beta_{pol}, l_i, I_p$ ). In particular, the vertical stabilization system has been designed assuming that the vertical plasma centroid position can be estimated by a suitable linear combination of the available magnetic measurements. A possible partial failure of these magnetic diagnostics has already been taken into account, showing a good resilience to such events. However, in case of severe failures, it will be necessary to resort to a completely different (i.e. non-magnetic) measurement of the vertical position.<sup>3</sup> As an example, we apply this method to the simulated signal of a double, soft X-ray spectrometer looking at the top and bottom of the plasma edge. The spatial and spectral features of these signals seem, in many cases, sufficient to discriminate between actual movements of the plasma column and changes in the plasma parameters.

<sup>1</sup>Sponsored in part by ENEA of Italy and by the U.S. D.O.E.

<sup>2</sup>R. Albanese, F. Villone, *Nucl. Fusion* **38**, 723 (1998)

<sup>3</sup>F. Bombarda, et al., *35th EPS Plasma Phys. Conf.* P4.073 (2008)

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Date submitted: 17 Jul 2008

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