

Abstract Submitted
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Design of an Integrated Plasma Control System and Extension of XSCTools to Ignitor¹ R. ALBANESE, G. AMBROSINO, G. ARTASERSE, A. PIRONTI, G. RUBINACCI, F. VILLONE, CREATE, Italy, G. RAMOGIDA, ENEA, Italy — The performance of the integrated system for vertical stability, shape and plasma current control for the Ignitor machine has been assessed by means of the CREATE_L linearized model of plasma response² against a set of disturbances for the reference 11 MA limiter configuration and the 9 MA Double Null configuration. A new design, based on the methodology of the eXtreme Shape Controller (XSC) at JET, has been tested : by using all the shape control circuits with the exception of those used to control the vertical stability is possible to control up to four independent linear combinations of the 36 plasma-wall gaps. The results point out a substantial improvement in shape recovery, especially in the presence of a disturbance in l_i . The new shape controller can also automatically generate, via feedback control, new plasma shapes in the proximity of a given equilibrium configuration. The XSC Tools³ have been adapted and extended to develop linearized Ignitor models including 2D eddy currents and to solve inverse linearized plasma equilibria.

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³G. Ambrosino, R. Albanese et al., *Fus. Eng. & Des.* **74**, 521 (2005)

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