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Plasma Chamber and First Wall of the Ignitor Experiment* A. CUCCHIARO, G. CELENTANO, C. CRESCENZI, P. FROSI, G. MADDALUNO, G. MAZZONE, A. PIZZUTO, G. RAMOGIDA, M. ROCCELLA, ENEA, Italy, B. COPPI, M.I.T., A. BIANCHI, B. PARODI, Ansaldo Ricerche,Italy, F. LUCCA, A. MARIN, L.T. Calcoli, Italy — The new designs of the Plasma Chamber (PC) and of the First Wall (FW) system are based on updated scenarios for vertical plasma disruption (VDE) as well as estimates for the maximum thermal wall loadings at ignition. The PC wall thickness has been optimized to reduce the deformation during the worst disruption event without sacrificing the dimensions of the plasma column. A non linear dynamic analysis of the PC has been performed on a 360° model of it, taking into account possible toroidal asymmetries of the halo current. Radial EM loads obtained by scaling JET measurements have been also considered. The low-cycle fatigue analysis confirms that the PC is able to meet a lifetime of few thousand cycles for the most extreme combinations of magnetic fields and plasma currents. The FW, made of Molybdenum (TZM) tiles covering the entire inner surface of the PC, has been designed to withstand thermal and EM loads, both under normal operating conditions and in case of disruption. Detailed elasto-plastic structural analyses of the most (EM) loaded tile-carriers show that these are compatible with the adopted fabrication requirements.
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☐ Prefer Oral Session
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