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Impact of Divertor Geometry on ITER Scenarios Performance in the JET Metallic Wall

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The transition from a full carbon wall to tungsten components in the divertor and beryllium components plasma facing components in JET has been an essential step in 2011 for demonstrating the compatibility of ITER scenario with a metallic environment. Specific exploration of the divertor geometry have been conducted in JET in 2013 to identify the divertor conditions showing the optimum confinement and thermal neutron rate for both the baseline scenario (BetaN=2) and the hybrid scenario (BetaN=3). The global confinement in the baseline scenario (2.5MA/2.75T) is maximised when the strike points are located in the divertor corner close to the pumping throat where pumping is maximised. It is the lowest when the strike points are located on the vertical target which is also the ITER divertor configuration. The height of the density pedestal drops by a factor of 2 when the outboard pumping gorge is located in the private flux region, suggesting a change in the effective particle source. The electron temperature profile changes are small, however for discharge run in the divertor corner the pedestal and core ion temperature profile is increased by typically 30%. Record neutron rate pulses have been achieved in the hybrid scenario with low triangularity at 2.35T/2MAs BetaN˜3.2 and H98y2˜1.4 with the outer strike point located in the pumping throats in comparison to similar discharges with the strike point away from the divertor corner.

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