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First long pulse experiments with the actively cooled W-divertor in WEST A EKEDAHL, C BOURDELLE, J BUCALOSSI, N FEDORCZAK, T LOARER, P MOREAU, E TSITRONE, J-F ARTAUD, L DELPECH, C DESGRANGES, P DEVYNCK, CEA, IRFM, T DITTMAR, Julich, Germany, R DUMONT, J GASPAR, C GIL, M GONICHE, J P GUNN, CEA, IRFM, C C KLEPPER, ORNL, USA, P MAGET, J MORALES, R NOUAILLETAS, Y PEYSSON, X REGAL-MEZIN, C REUX, D VEZINET, CEA, IRFM, F-13108 Saint Paul-lez-Durance, France., WEST TEAM — WEST is a full tungsten (W) superconducting tokamak with large aspect ratio (˜5), whose mission is to assess power exhaust with ITER actively cooled divertor technology and to master long pulse operation in a metallic environment. Repetitive and reliable long L-mode X-point discharges (˜30 s) have been achieved in WEST, accumulating ˜20 minutes of plasma over two days. They were performed in upper single null configuration on the actively cooled W-divertor, using 2.7 MW Lower Hybrid (LH) power and nitrogen seeding in some discharges. The plasma radiation and density remained constant during the long pulses, indicating that no W-accumulation was taking place. In short pulses, 5.0 MW of LH power has been coupled in L-mode discharges. The central electron temperature increases linearly with the input power and reaches 5 keV with 5.0 MW of LH power. Loop voltage <0.15 V is achieved for line average density $<4*10^{19}$ m^{-3}, with no sign of loss of LH current drive efficiency at the highest density. In the experiments, the heat load pattern on the divertor target is monitored with a unique set of PFC diagnostics (infrared systems, Langmuir probes, thermocouples, Fiber Bragg gratings).

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