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Helium L-H transition threshold studies in JET-ILW[1] EMILIA R. SOLANO, Laboratorio Nacional de Fusion, CIEMAT, Madrid, Spain, M MASLOV, CCFE, Culham Science Centre, Culham, UK, E DELABIE, ORNL, Oak Ridge, TN-37831-6169, USA, G BIRKENMEIER, Max Planck Institute for Plasma Physics, Garching, Germany, I JEPU, Laser, Plasma and Radiation Physics, Magurele-Bucharest, Romania, A SHAW, J HILLESHEIM, CCFE, JET CONTRIBUTORS TEAM — For ITER, it is important to establish the L-H transition power threshold (P_{LH}), so H-modes can be investigated in its non-active phase, be it in Hydrogen, Helium, or suitable mixtures. In JET-C He and Deuterium appeared to have similar P_{LH} [1]. In JET-ILW we have shown that adding Helium to a Hydrogen plasma can reduce P_{LH} [2]. Here we report on recent L-H transition experiments with ^{4}Helium plasmas at JET-ILW, heated either with D-NBI or ICRH of H minority, with broad density scans. In all cases n_{D+H}/n_e<5% at the time of the L-H transition. The He and H+D concentrations were measured spectroscopically using the ratio of ^{4}He and D lines in an Optical Penning gauge in the subdivertor. Results at 1.8 T, 1.7 MA and 2.4 T, 2 MA reveal that the electron density at which the power threshold is minimum, $n_{e,min}$, is 60-70% higher in Helium plasmas than in Deuterium plasmas, while it is only 35% higher for Hydrogen at 1.8 T. [1] D. McDonald, PPCF 46, p. 519 (2004). [2] J. Hillesheim et al, 27th IAEA Fusion Energy Conference, Ahmedabad, India (2018).

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