

Abstract Submitted
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The low density type III ELMy H-mode regime on JET-ILW: a low density H-mode compatible with a tungsten divertor?¹ E. DELABIE, ORNL, USA, J. C. HILLESHEIM, J. MAILLOUX, C. F. MAGGI, F. RIMINI, CCFE, UK, E. R. SOLANO, CIEMAT, Spain, JET CONTRIBUTORS TEAM — The threshold power to access H-mode on JET-ILW has a minimum as function of density [1]. Power ramps in the low and high density branch show qualitatively very different behavior above threshold. In the high density branch, edge density and temperature abruptly increase after the L-H transition, and the plasma evolves into a type I ELMy H-mode. Transitions in the low density branch are gradual and lead to the formation of a temperature pedestal, without increase in edge density. These characteristics are reminiscent of the I-mode regime [2], but with high frequency ELM activity. The small ELMs allow stable H-mode operation with tolerable tungsten contamination, as long as both density and power stay below the type I ELM boundary. The density range in which the low density branch can be accessed scales favourably with toroidal field but unfavourably with isotope mass. At $B_T=3.4T$, a stable H-mode has been obtained at $\langle n_e \rangle = 2.9 \cdot 10^{19} m^{-3}$ with up to 15MW of heating power at $H98y \approx 0.9$. Better knowledge of the operational boundaries of this high frequency ELM regime could provide insight in how to sustain it at higher heating power for high temperature scenarios. [1] Maggi et al., Nucl. Fus. 54, 023007 (2014) [2] Whyte et al., Nucl. Fus. 50, 105005 (2010)

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Ephrem Delabie
Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831-6169, USA

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