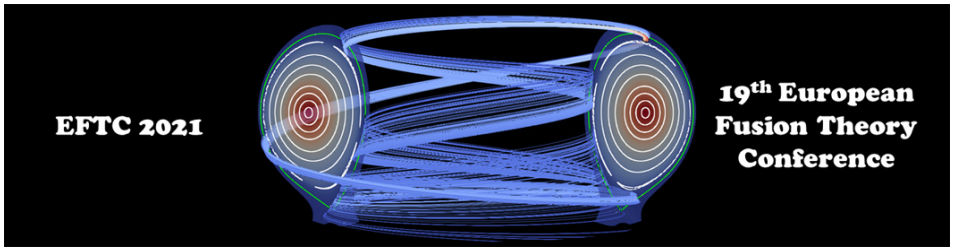


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# L-H transition studies at JET: challenges to theory

*Wednesday 13 October 2021 10:40 (30 minutes)*

We present results from a variety of dedicated L-H transition studies at JET-ILW, emphasizing the discrepancies between experimental data and accepted models of the transition. From earlier experiments in JET-ILW it is known that as plasma isotopic composition changes from deuterium, through varying deuterium/hydrogen concentrations, to pure hydrogen, the value of the density at which the threshold is minimum, ne,min, increases, leading us to expect ne,min(T) < ne,min(D). Preliminary analysis of the first JET-ILW Tritium L-H experiments, shows transient ohmic L-H transitions for ne< ne,min(D), as expected. At higher densities, with NBI heating, we see hints of PLH(T) < PLH(D). An analysis of Doppler reflectometer measurements of the radial electric field in D and He plasmas has been carried out. We do not find a critical radial electric field value or vExB rotation before the transition. Instead, it appears that the diamagnetic velocity, proportional to $\nabla p$, may be a better indicator of the required conditions for an L-H transition. In H vs D it has been shown that the reason for the increased PLH in H is that lower confinement in H implies higher fuelling and power are required to match the edge pressure profiles before the transition. This also tells us that $\nabla p$ before the transition is important, and is a reminder that PLH is in fact determined by plasma transport characteristics in L-mode. Planned confinement studies in T may help elucidate this connection.

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