

The EUROfusion JET-ILW global confinement database

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In 2009-2011 so-called ITER-like wall was installed on JET tokamak, with beryllium limiters and tungsten divertor. Change of the plasma facing materials from carbon to metallic had a significant effect on plasma operations and confinement. Achieving steady plasma performance has become more challenging due to impurity accumulation [1], which has put additional constraints on the available operational space. Confinement in scenarios with low $P_{\text{loss}}/P_{\text{LH}} < 2$ was found to be worse with respect to similar scenarios in JET C-wall, due to degraded confinement in the pedestal [2].

This contribution summarises the recent work done under the EUROfusion JET confinement database project. The project encompasses the systematic collection and study of the JET 0-D data as well as sharing with interested parties such as the international H-mode confinement database. The work is presently focussed on the JET-ILW data which has not been included into the international multimachine database until now. Virtually all steady state type I ELMy H-mode plasmas achieved in the JET-ILW period so far were included in the dataset, with all the standard engineering parameters and measured quantities. The database is in progress of being converted to the IMAS (ITER Integrated Modelling & Analysis Suite [3]) format and will be made available to the EUROfusion Research Units and collaborators.

The database is under continuous development and expansion of the dataset with new pulses is anticipated, including the future TT and DT operations. For the presently available data a study of the global energy confinement scaling with various parameters will be shown in this work together with comparison to the widely used HIPB98(y,2) scaling. The domain of existence of JET-ILW confinement database will be compared with the JET-C one. Effect of the parameters which are not included into the H98 scaling will also be discussed, such as divertor configuration, gas fuelling, SOL density and neutral gas pressure outside the plasma.

[1] G. Matthews et al, "Plasma operation with an all metal first-wall: Comparison of an ITER-like wall with a carbon wall in JET", Journal of Nuclear Materials, Volume 438, Supplement, July 2013, S2-S10

[2] M.N.A. Beurskens et al, "Global and pedestal confinement in JET with a Be/W metallic wall" Nucl. Fusion 54 (2014) 043001

[3] S.D Pinches et al, 44th EPS Conference on Plasma Physics (Belfast, Ireland), P4.155

<http://ocs.ciemat.es/EPS2017PAP/pdf/P4.155.pdf>