

## The Lithium Wall Stellarator Experiment in TJ-II

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The liquid lithium divertor concept is at present one of the most appealing solutions for the particle and power handling challenges to face in a Fusion Reactor, and it has been proposed by several groups in the Tokamak community [1,2]. Excellent results have been obtained already, even under only partial coverage of the walls, in limiter and divertor Tokamaks and Compact Toruses, providing in many instances record values of plasma parameters and enhanced plasma reproducibility. In stellarators, on the other hand, a clear correlation between low recycling wall conditions and enhanced, reactor relevant, confinement modes has been established, being the achievement of the IDB-SDC mode in LHD the most conspicuous example [3]. Compared to tokamaks, stellarator plasmas show distinct features in their interaction with the surrounding materials. The lack of disruptions and type I ELMs make them more reliable for reactor operation. So it is the lack of MHD-driven density limit. In the last year, the plasma performance of the TJ-II Helic under low recycling, Li-coated wall conditions has been tested for the first time in a stellarator [4,5]. Compared to previous coatings, lithium has produced the best plasma performance to date, leading to the achievement of record values in plasma density and energy confinement. In the present work, the impact of the Li coating operation on edge characteristics and plasma wall interaction issues will be described. Future research lines in this direction, with impact on the design of a Li stellarator reactor concept, will be addressed.

[1] J.N Brooks et al. J. Nucl. Mater. **337-339**(2005) 1053 and refs. therein

[2] S.V. Mirnov et al Plasma Phys. Control. Fusion **48**(2006) 821 and refs. therein

[3] A. Komori et al. 18<sup>th</sup> PSI Conference Toledo, Spain. 2008. To appear in JNM

[4] J. Sánchez et al 18<sup>th</sup> PSI Conference Toledo, Spain. 2008. To appear in JNM

[5] F.L. Tabarés et al. 35<sup>th</sup> EPS Conference, Hersonissos GR. To appear in PPCF