

**Coupling of SOL density profiles with edge plasma parameters
in the TJ-II stellarator**

T. Wu¹, B. Liu², U. Losada², E. de la Cal², A. Malaquias³, B. van Milligen², J.L. de Pablos², C. Silva⁴, and C. Hidalgo²

1 Southwestern Institute of Physics, Chengdu, China

2 Laboratorio Nacional de Fusion, CIEMAT, 28040 Madrid, Spain

3 Instituto Superior Técnico, Lisbon, Portugal

This work has addressed the question of whether anomalous transport driven by the plasma edge influences the scrape-off layer width in the TJ-II Stellarator.

It has been found that the SOL density profile is affected by the structure of edge radial electric fields, either driven by edge plasma transition (i.e. electron-ion root transition) or by external edge biasing. The coupling between edge and SOL regions depends on the magnitude of the edge shearing rate. Furthermore, SOL density increases with ECRH heating power and decreases in NBI plasma regimes with reduced level of edge plasma turbulence. It is concluded that SOL profiles are coupled to edge plasma parameters and consequently optimizing SOL power exhaust conditions requires considering transport in the edge region. Results about this topic from HL-2A tokamak will also be presented.