Contribution ID: **3571** Type: **not specified**

P5.1031 Study of the two null nearby divertor magnetic configuration at EAST

Friday, 12 July 2019 14:00 (2 hours)

See full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P5.1031.pdf

Two of the biggest challenges for future fusion reactors are the power dissipation and erosion of diverter targets. Alternative configurations such as Snowflake [1] (SF) and the Quasi-snowflake family (QSF), including Two Null nearby divertor [2] (TNND), have the aim of controlling and optimising the magnetic flux expansion and the connection length. These can reduce the peak power flux and the temperature at the strike points enhancing the recombinations in the divertor region, in order to access the detachment state. The EAST tokamak is capable of pursuing advanced exhaust experiments with alternative magnetic configurations. The preliminary experiments dedicated to TNND were conducted at EAST with the aim of testing the potential of this alternative configurations, by moving the secondary x-point during the discharge evolution with the results of a increase of ~30% of connection length and a factor ~4 in the flux expansion, compared with the Single Null initial case. In this contribution the impact of distance between the two nulls of TNND, is investigated via the 3D edge plasma fluid and neutral particle transport code EMC3EIRENE [3]. A predictive study has been done to compare two TNND with different position of the second null and similar characteristic to the experimental one, studying the effect of second null's position on the power exhaust. The Peak power load in the TNND cases, in function of density and power entering the SOL, compared with a reference Single Null magnetic configuration, shown a significative reduction thanks to a lower value of Bp/ Btot in the divertor region. Instead the fraction of recombinations near the targets is negligible for the whole cases, although TNND's fraction is greater than SN case, at the same density.

[1]Ryutov D.D,. et al, Phys Plasmas 15 (2008) 092501
[2]G. Calabrò, et al., Nucl. Fusion 55 (2015) 083005
[3]Y. Feng, et al., Contrib. Plasma Phys. 54(4-6), 426-431 (2014)

Presenter: MEINERI, C. (EPS 2019)

Session Classification: Poster P5

Track Classification: MCF