

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Spherical tokamaks with plasma centre-post¹ CELSO RIBEIRO, Escuela de Ingenieria Electronica del Instituto Tecnologico de Costa Rica — The metal centre-post(MCP) in tokamaks is a structure which carries the total toroidal field current and also houses the Ohmic heating solenoid in conventional or low aspect ratio (Spherical)(ST) tokamaks. The MCP and solenoid are critical components for producing the toroidal field and for the limited Ohmic flux in STs. Constraints for a ST reactor related to these limitations lead to a minimum plasma aspect ratio of 1.4 [1] which reduces the benefit of operation at higher betas in a more compact ST reactor. Replacing the MCP is of great interest for reactor-based ST studies since the device is simplified, compactness increased, and maintenance reduced. An experiment to show the feasibility of using a plasma centre-post(PCP) is being currently under construction and involves a high level of complexity[2]. A preliminary study of a very simple PCP, which is ECR(Electron Cyclotron Resonance)-assisted and which includes an innovative fuelling system based on pellet injection, has recently been reported. This is highly suitable for an ultra-low aspect ratio tokamak(ULART) device[3]. Advances on this PCP ECR-assisted concept within a ULART and the associated fuelling system are presented here, and will include the field topology for the PCP ECR-assisted scheme, pellet ablation modeling, and a possible global equilibrium simulation.

[1] R.D.Stambaugh et al., Fus. Eng. Design, 41, p385, Sep98

[2] P.Micozzi et al., Nucl. Fusion, 50, p1, Jul10

[3] C.Ribeiro, Proc. 25th Symp Fus. Eng., SF, US, Jun13

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Date submitted: 09 Jul 2013

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