Contribution ID: **499** Type: **Poster**

Development of a new CODAS for the TCABR tokamak

Monday 13 May 2019 16:50 (15 minutes)

An upgrade is being conducted on the TCABR tokamak, which is a small-size tokamak (R0 = 0.62 m and a = 0.2 m) operated at the University of São Paulo, Brazil. This upgrade consists mainly in the installation of (i) graphite tiles to cover entirely the inner surface of the vacuum vessel wall, (ii) new poloidal field (PF) coils to allow for the generation of various divertor configurations such as single-null, double-null, snowflake and x-point target divertors, (iii) in-vessel HFS and LFS non-axisymmetric control coils for ELM suppression studies, and (iv) a coaxial helicity injection system to improve plasma start-up. Among other goals, this upgrade will allow for studies of the impact of RMP fields on advanced divertor configurations, such as the x-point target and snowflake divertors. The creation of the various plasma scenarios that are envisaged for TCABR will require a robust and flexible plasma control system. The new TCABR plasma shape and position control is being designed and will be based on a feedback PID technique. The design of the new PID controllers will be carried out using the so-called RZIp model [Coutlis et al., Nuclear Fusion (1999) 39 663]and, in this work, the algorithms, programs and codes used to tune the plasma control system will be presented. Experimental data for the TCABR tokamak is currently stored in MDSplus (Model Driven System Plus) database and together with the data acquisition system, remote access (CODAS) [W.P. de Sa, G. Ronchi, Fusion Eng. Des.(2016) 112 1034] will be upgraded to fit the plasma control presented above and it will also be discussed.

Authors: Dr PIRES DE SÁ, Wanderley (Institute of Physics of the University of São Paulo, São Paulo, Brazil); Dr CANAL, Gustavo (Institute of Physics of the University of São Paulo); Dr SEVERO, Jose Helder Facundo (Institute of Physics of the University of São Paulo, São Paulo, Brazil); Dr GALVAO, Ricardo Magnus Osorio (Institute of Physics of the University of São Paulo, São Paulo, Brazil); Mr SANTOS, Alessandro (Mauá Institute of Technology); Dr KOMATSU, Wilson (Polytechnic School of the University of São Paulo, São Paulo, Brazil); Dr KASSAB, Fuad (Polytechnic School of the University of São Paulo, São Paulo, Brazil); Mr FERREIRA, Julio Guimaraes (Nacional Institute for Space Research, São José dos Campos, Brazil); Dr PIQUEIRA, Jose Roberto Castilho (Polytechnic School of the University of São Paulo, São Paulo, Brazil); Dr NACIMENTO, Ivan Cunha (Institute of Physics of the University of São Paulo, São Paulo, Brazil)

Presenter: Dr PIRES DE SÁ, Wanderley (Institute of Physics of the University of São Paulo, São Paulo, Brazil)

Session Classification: Poster

Track Classification: Plasma Control