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The new CODAS implementation for the TCABR tokamak upgrade

An update is being carried out on the TCABR tokamak (small tokamak, with R0 = 0.62 m and a = 0.2 m) in operation at the Physics Institute of the University of São Paulo, Brazil. This upgrade consists of the installation of (i) graphite tiles to fully cover the inner surface of the vacuum vessel wall, (ii) new poloidal field (PF) coils to allow the generation of diverse plasma configurations, (iii) HFS in the vessel and non-symmetrical control coils for ELM suppression studies and (iv) a coaxial helical injection system to improve plasma initiation. Among other objectives, this update will enable studies of the impact of RMP fields on advanced offset configurations such as x-point target and snowflake diversion. To create the various plasma scenarios foreseen for the new TCABR, the implementation of a robust and flexible plasma control system, improvements to the data acquisition and analysis system and the implementation of supervisors to monitor the various systems involved are underway in the operation of the tokamak (EPICS - Multithreaded Application Real-Time executor, MARTe - Experimental Physics and Industrial Control System), improvements in the MDSplus system (Model Driven System Plus) already widely used in the TCABR tokamak and implementation of a Web system (using PHP, JavaScript, python) for generating experiment configurations and improving interaction between operators/scientists and the experiment. In this work we will present the details of this ongoing implementation.

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