Progress in the migration towards the real time framework MARTe at FTU

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Keeping in mind the proposed FAST experiment [1] and aiming to meet basic requirements such as a modular and distributed architecture, where different control subsystems can be easily integrated at different times, and can operate either independently or in cooperation with other subsystems, at the end of last year we planned to upgrade the architecture of the FTU real time system, improving in such a way its flexibility and modularity. We decided to adopt two available packages to reach our goal: MARTe and RTNet [2]
We report on the state of the art of the MARTe migration process, the difficulties dealt with, the benefits and advantages achieved, the progress made from our last report and, in particular, we describe the integration of the ODIN equilibrium reconstruction system in the real time environment based on the MARTe architecture. The approach to the ODIN code was already discussed in [3], but its integration in the real time system has never been carried out at FTU. We illustrate how the MARTe architecture and the RTNet protocol allow for a high parallelization level and then for a dramatic computational time reduction

[1] Calabro' G. et al., FAST Plasma Scenarios and Equilibrium Configurations. G. Calabrò *et al* 2009 *Nuclear Fusion* 49 p. 055002

[2] Boncagni L., Pucci D., Sinibaldi S., Vitale V., Vitelli R., Zaccarian L. &Zamborlini G. . First steps in the FTU migration towards a modular and distributed real time control architecture based on MARTe and RTNet. Submitted and accepted at the 17th Real Time 2010 Conference . Lisboa, Portugal, May 2010

[3] Sadeghy Y., Ramogida G., Boncagni L., D'epifania C., Vitale V., Crisanti, F. & Zaccarian L. Real Time Construction of Plasma Equilibrium in FTU. IEEE Transactions on Plasma Science, Vol. 38, NO 3, March