

Name	Degree	% participation
Daniel Filipe Valcarcel	MsC	100%

## Part I – Scientific Activities

### Participation in the collective use of the JET facilities by the EFDA Associates

#### Summary and highlights of research achievements

For the JET ITER-like wall project the design of the wall thermal load monitoring software (WALLS2011) was completed. Following that WALLS2011 was implemented on top of the MARTE real-time framework, integrated in CODAS (Level-1, RTDN network, supervisor and data collection) and commissioned during the JET restarts. This software is responsible for monitoring:

- Plasma strike point position and field line inclination (with respect to the divertor and upper dump plate tiles) for both the lower and upper strike points
- Plasma to limiter tile gaps
- Divertor tile energy, based on models taking into account divertor field line shadowing
- Limiter tiles surface temperature, based on models taking into account limiter to limiter field line shadowing

For these monitored properties when any defined limit is violated the software raises alarms handled by the JET Real-Time Protection Sequencer (RTPS).

WALLS2011 is running routinely as part of the ITER-like wall protection system and it is based on physical models developed by the Plasma Operations Group (POG). An offline tool for the analysis of the WALLS2011 alarms was developed and it is used whenever a stop is issued to diagnose the cause (if due to WALLS2011).

A tool (ATMTestTool) for Linux was developed in C and allows to test ATM links. This tool works by exchanging ATM datagrams between hosts, on a specified VPI and VCI, and test whether a successful link exists between them. This has been used primarily to test the configuration of the ATM switches and the physical optical links. It also allows to determine the roundtrip time by setting up one host as the server, echoing all the received ATM datagrams, and another as a client that sends a datagram and counts time until it arrives back.

### Participation in the ITER project

#### Summary and highlights of research achievements

Minor improvements to the ConfigurationLibrary for MARTE, to allow connecting the latter to the ITER CODAC EPICS tools on the first software prototypes.

## Part II – Scientific Output

### A. Publications

**Papers in international refereed scientific journals**

Author(s)	D.F. Valcarcel, A. Neto, I.S. Carvalho, B.B. Carvalho, H. Fernandes, J. Sousa, F. Janky, J. Havlicek, R. Beno, J. Horacek, M. Hron, R. Panek
Paper title	The COMPASS Tokamak Plasma Control Software Performance
Journal name	IEEE Transactions on Nuclear Science
Volume, page	58, 1490 - 1496
Year	2011

Author(s)	D.F. Valcarcel, A. Barbalace, A. Neto, A.S. Duarte, D. Alves, B.B. Carvalho, P.J. Carvalho, J. Sousa, H. Fernandes, B. Goncalves, F. Sartori, G. Manduchi
Paper title	EPICS as a MARTE Configuration Environment
Journal name	IEEE Transactions on Nuclear Science
Volume, page	58, 1472 - 1476
Year	2011

Author(s)	A. Barbalace, G. Manduchi, G. De Tommasi, A. Neto, F. Sartori, D. F. Valcárcel
Paper title	Performance comparison of EPICS IOC and MARTE in a Hard Real-Time Control Application

Journal name	IEEE Transactions on Nuclear Science
Volume, page	58, 3162 - 3166
Year	2011

Author(s)	F. Janky, J. Havlicek, D.F. Valcárcel, M. Hron, J. Horacek, O. Kudlacek, R. Panek, B.B. Carvalho
Paper title	Determination of the plasma position for its real-time control in the COMPASS tokamak
Journal name	Fusion Engineering and Design
Volume, page	86, 1120-1124
Year	2011

## E. Distinctions and awards

### Refereeing of scientific publications

D.F. Valcárcel served as referee for a paper published on the proceedings of the 20th Annual Student Conference "Week of Doctoral Students 2011" held at Charles University in Prague from May 31 to June 3, 2011.