



Contribution ID: 353

Type: **Poster**

ITR/2-2Ra: Imaging Challenges for the ITER Plasma Facing Components Protection

Thursday, 11 October 2012 08:30 (4 hours)

The ITER actively cooled tokamak is the next-generation fusion device which will allow studying the burning plasma during hundreds of seconds. ITER plasma facing components (PFCs) real-time protection will be mandatory to minimize operational risks as critical heat flux leading to degradation of PFCs and eventually to water leak. Thanks to Tore Supra expertise in actively cooled tokamak and long pulse operation, urgent research and development actions are presented and discussed addressing the feasibility and the performances of the PFCs protection function foreseen in ITER using a network of wide angle visible and IR imaging systems (VIS/IR WAVS). Three major steps addressing PFCs protection have been reached. First, the contribution of reflected light that could disturb the measurement of surface temperature has been taken into account through an industrial physic-based Monte Carlo ray-tracing method. Secondly, an integrated software and hardware framework validated on existing fusion devices has been proposed. In addition, extended functionalities to analyze and understand in real-time the huge volume of images produced by the VIS/IR WAVS have also been developed. Finally prototypes of ITER first mirrors have been built and tested with successful first results. These results demonstrate that a more precise definition of the functional specifications of the entire imaging system can be obtained addressing both machine protection and plasma performance.

Country or International Organization of Primary Author

France

Primary author: Mr TRAVERE, Jean-Marcel (France)

Co-authors: Mr THELLIER, Christophe (THALES-SESO); Dr CHABAUD, Dominique (OPTIS); Mr HUMBERT, Eric (OPTIS); Mr FERME, Jean-Jacques (THALES-SESO); Dr MAROT, Laurent (University of Basel, Department of Physics); Dr AUMEUNIER, Marie-Helene (OPTIS); Mrs JOANNY, Maryline (CEA/IRFM); Dr LOARER, Thierry (CEA/IRFM); Mr MONCADA, Victor (CEA/IRFM); Dr MARTIN, Vincent (CEA/IRFM)

Presenter: Mr TRAVERE, Jean-Marcel (France)

Session Classification: Poster: P5

Track Classification: ITR - ITER Activities