MT 26
International Conference on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: **1441**   Type: **Poster Presentation**

Wed-Af-Po3.23-06 [91]: Integrating Modeling Toolchain into High Field Magnet Monitoring and Control system.

Wednesday, 25 September 2019 14:00 (2 hours)

The Laboratoire National des Champs Magnetiques Intenses (LNCMI) is a French large scale facility, part of the European Magnetic Field Laboratory (EMFL), enabling researchers to perform experiments in the highest possible magnetic field. On its Grenoble site, the LNCMI provides up to 37 teslas combining a PolyHelices and Bitter magnet.

Following the power upgrade from 24 to 30 MW, the control and monitoring have been completely redesigned. Magnet activities are recorded into a database and can be easily tracked down on a web interface. Magnet characteristics (namely geometry and materials property) are also stored into a database. This allows to keep a record of all events during a magnet lifetime, to have access to instant data such as power consumption, cooling water temperature, …

In parallel, a numerical toolchain, HiFiMagnet has been developed in collaboration with Institut de Recherche Mathematique Avancee (IRMA) from Strasbourg University to simulate the magnets ranging from simple OD to full 3D models. Over the last three years, HiFiMagnet has reached a level of maturity
and has been selected as a pilot for the MSO4SC H2020 project. MSO4SC is an e-infrastructure that provides services and resources for simplifying the use and development of large scale applications on HPC in the cloud.

To get better control and follow-up on our magnets, we have connected the monitoring system and MSO4SC platform in order to:

Extract and setup HiFiMagnet simulation from an existing magnet in operating condition,
Provide predictive behavior of the magnets from a control perspective,
Help researchers by providing more accurate field map to prepare, design and exploit their experiments.

This work is illustrated by examples targeting both the magnet designer and the end-user.

Primary author: Dr TROPHIME, Christophe (Christophe)

Co-authors: Prof. PRUDHOMME, Christophe (IRMA/Univ. Strasbourg); Mr GRANDCLÉMENT, Cédric (LNCMI-EMFL-CNRS, UGA); DEBRAY, Francois (CNRS); Dr JAY, Olivier (LNCMI-CNRS); Dr HILD, Romain (IRMA/Uni Strasbourg)

Presenter: Dr TROPHIME, Christophe (Christophe)

Session Classification: Wed-Af-Po3.23 - Resistive and Pulsed High Field Magnet II