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Assembly of the Nb3Sn dipole magnet FRESCA2

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The Nb3Sn dipole magnet FRESCA2 has been developed and manufactured within the framework of a collaboration between CEA Saclay and CERN. The aim of the magnet is to upgrade the superconducting cable test station FRESCA at CERN with a Nb3Sn dipole providing a 13 T magnetic field in a 100 mm aperture. The magnet is composed of 4 coils in a block-type configuration with flared ends, 1.6 m long, housed in a bladder and key type mechanical structure. FRESCA2 has been assembled at CERN at the end of 2016 with the 4 first Nb3Sn coils fabricated at CEA Saclay and CERN. The coils were dimensionally measured and electrically tested. Tailored-shims were fabricated and inserted in the coil pack to improve the contact between the different layers. In addition, tests with pressure sensitive films were carried out to verify the uniformity of the loading. In this paper we provide a detailed description of the various steps of the assembly from the impregnated coils to the delivery of the dipole to the test facility, with particular emphasis on the procedures followed and the tooling developed.

Submitters Country

Switzerland

Primary author: BOURCEY, Nicolas (CERN)

Co-authors: GAUTHIER, Remy (CERN); PINCOT, Francois-Olivier (CERN); RIFFLET, Jean-Michel; GROSCLAUDE, Philippe; MANIL, Pierre (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR)); CARLON ZURITA, Alejandro (CERN); ROCHEPAULT, Etienne (CERN); PEREZ, Juan Carlos (CERN); FERRACIN, Paolo (CERN); DE RIJK, Gijs (CERN); FERRADAS TROITINO, Jose (Centro de Investigaciones Energéti cas Medioambientales y Tecno); RONDEAUX, Francoise (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR))

Presenter: BOURCEY, Nicolas (CERN)

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