Contribution ID: **293** Type: **not specified**

Investigation of the mechanical properties of epoxy impregnated Nb3Sn cables

Tuesday 30 May 2017 18:48 (2 minutes)

In the framework of the FCC study, the Nb3Sn technology plays a crucial role for high-field superconducting magnets. The new generation Nb3Sn cable greatly contributes to bring the magnetic field produced by the superconducting dipole magnets to the 16 T level; nevertheless, its mechanical properties are unknown making it difficult to predict the mechanical behaviour of the magnet structure. For this reason, an extended experimental campaign on specimens made from a stack of 10 Nb3Sn cables was launched at CERN. The 10-stack can be considered a representative sample of the magnet coil because it is produced following the same construction process: curing, reaction and impregnation. The experimental campaign consists of compression tests along the three sample directions at room temperature and 77 K. A dedicated test bench was designed to measure the vertical and lateral deformations of the sample. This work presents the production process of the Nb3Sn 10 stacks and the features of the experimental setup. The stress-strain relationships and the Poisson's ratios are analysed focusing on the effect of loading speed rate and temperature.

Author: FICHERA, Claudio (CERN)

Co-authors: BERTARELLI, Alessandro (CERN); VALLONE, Giorgio (CERN); GUINCHARD, Michael (CERN); SACRISTAN DE FRUTOS, Oscar (CERN); FERRACIN, Paolo (CERN)

Presenter: FICHERA, Claudio (CERN)

Session Classification: Poster session