

Summary of “Dimensional measurements of Nb₃Sn coils after impregnation”.

Within the High-Luminosity LHC upgrade, several Nb-Ti based magnets will be replaced by Nb₃Sn based dipoles and quadrupoles [1]. The development of this technology reached its final stages with the production of short model magnets and full-length prototypes. Eventually, the production of the actual Nb₃Sn dipoles that are going to be installed in the LHC has been commissioned already.

The desirable performance of these superconducting magnets relies on the characteristics of the conductor as well as on absolutely mastered manufacturing techniques and high precision assemblies with tight tolerances. It is therefore of crucial importance to precisely determine the geometry of the parts involved and be able to compensate deviations inherent to the production.

This presentation aims to show the methodology, the analysis convention and the results gathered of the systematic dimensional measurements performed on the 11T dipole and MQXF quadrupole in all of their flavors (short model magnets and long prototypes including measurements performed in the US using the same criteria). Thanks to these results it is been considered necessary to use a thinner braiding insulation of the conductor for the 11T dipole in order to achieve better coil geometry.

[1] L. Rossi, “LHC upgrade plans: Options and strategy,” Proc. Int. Part. Accel. Conf.