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Alignment measurements of HL-HLC superconducting quadrupole cryo-assemblies at CERN

Within the framework of the HL-LHC project at CERN, the rollout of the series production of the superconducting Nb3Sn quadrupole magnets (MQXFB) is 60 % complete. In parallel, the cryo-assembly LMQXFB (Q2) series production has begun. The Q2 cryo-assemblies consist of a cold mass containing an MQXFB quadrupole and a nested orbit corrector dipole, MCBXFB. Three cryo-assemblies were fully tested at 1.9 K and nominal current: LMQXFB01, LMQXFB02, and LMQXFB04. Alignment measurements were performed using a rotating-coil scanner at room temperature to characterize the bare cold mass and the stretched-wire system to characterize the cryo-assembly at room and cryogenic temperatures. Cryogenic measurements were performed at nominal current. This presentation reviews the measurement procedures and the relative challenges to reaching the stringent measurement requirements.

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