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Thu-Af-Or22-03: Cold tests of the first nested orbit corrector prototype for HL-LHC

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The first prototype of the short orbit corrector MCBXFB for the upgrade of the LHC has been fabricated at CIEMAT, in collaboration with CERN, in the framework of the HL-LHC project. It consists of two nested dipoles, with an aperture of 150 mm and physical length of 1.5 m.

A first cold test was performed without the outer dipole coils, which were replaced by a support structure to align the iron yoke with the collared inner dipole. This test was aimed to validate the coil fabrication techniques, which are innovative for a NbTi Rutherford cable.

A second cold test was done with the full assembled magnet. It showed the successful performance of the mechanical clamping which holds the torque when both dipoles are simultaneously powered.

This paper describes the test results and the analysis of the measurements. The magnet is heavily instrumented: seven voltage taps per coil, six sections of collars with strain gauges and one coil per dipole with bullet gauges.

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