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Thu-Af-Or22-02: Test of the first full-length prototype of the HL-LHC D2 orbit corrector based on Canted Cosine Theta technology

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In the frame of the high-luminosity upgrade project (HL-LHC) of CERN for the Large Hadron Collider (LHC), a new double aperture beam orbit corrector magnets will be installed near the recombination dipole (D2). These 2.2 m long NbTi dipoles are built with the “canted cosine theta”(CCT) technique. The two independently powered apertures are oriented such that their field vectors are perpendicular to each other and to the direction of the beams. After constructing and testing a 0.5 m model magnet, a full-length double aperture prototype was built and tested at CERN in the SM18 test facility. Here we present the power tests at 1.9 and 4.5 K: training of each aperture, magnetic field quality and cross-talk effects, quench detection system effectiveness, quench protection performance and quench-back with several energy extraction systems.

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