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Wed-Af-Po3.20-04 [57]: The Effects of Manufacturing Errors on Field Quality of a Canted-Cosine-Theta Twin Aperture Beam Orbit Corrector

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The High Luminosity LHC (HL-LHC) project, as an upgrade of the large hadron collider (LHC), is to be started in 2020. A set of twin aperture beam orbit corrector with Canted-Cosine-Theta (CCT) dipoles will be developed in China, with a field quality requirement of 10^{-3} in the two apertures. Cooperating with CERN, a twin aperture corrector is being fabricated as the prototypes before the series production. The corrector consists of two apertures and for each aperture there are two layers of CCT coils wound on aluminum formers by using 10 NbTi wires. During the fabrication of the CCT coils, certain manufacturing errors including the former tolerance error, rotation error, concentricity error and winding error were appeared, which affect the field harmonic components. This study analyzed the effects on field harmonic components by these manufacturing errors. Suggestions from the analysis results are provided the further series production of the 2.2-m orbit correctors.

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