Joint DESY and University of Hamburg Accelerator Physics Seminar

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Improvements in Optics Measurement Resolution for the LHC

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Abstract

With respect to the operation of the LHC in 2015 with an increased collision energy, an accurate measurement and correction of the optics will be crucial. The current algorithm to determine LHC beta–functions uses the phase advances between three adjacent beam position monitors (BPMs). Improvements to this algorithm have been studied that include choosing better suited BPM sets depending on the phase advances, but also introducing the systematic quadrupolar errors (b2) of the dipoles to the model which is used for the computation. For the computation of local corrections the segment–by–segment technique is used. Improvements on this method will be shown together with a method which tries to find lattice errors by fitting simulated optics to measured data by varying the strength and position of quadrupoles within their tolerances. This method showed promising results in combination with ALFA detector measurements.

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