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Fiducialisation for the next LHC magnet generation

With the end of the series production of the 1232 Dipoles and 474 quadrupoles in 2008, the majority of the fiducialisation activities ended. During the last ten years, only spare magnets and prototypes have been fiducialised and the systems (hardware and software) are obsolete today. The magnets to be exchanged in the LHC during the Long Shut-down 2 as well as the upcoming HL-LHC production (about 60 new magnets) are requiring again more measurements using state of the art measurement systems, applications and procedures. The measurement systems used in the past were laser trackers from the Leica LTD500 Series together with the AXYZ software. These laser trackers have been used extensively for almost 20 years and largely exceeded their expected lifetime. The software as well as the hardware are not maintainable anymore and need to make place for new systems.
The hardware was updated to the LEICA AT900 Series and the software to Spatial Analyzer. A new in-house software is taking care of the automatic data processing, calculation and the database upload. This software combines the advantages of using Spatial Analyzers's functionalities and measurement plans with a powerful architecture and data structure in C#. It operates on a universal data structure independent from the individual magnet design and allows covering the current and future magnet types. This paper describes the new equipment and software along with the strategy for the data treatment and storage in a universal data object.

Summary

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