



Contribution ID: 34

Type: ORAL

Evaluation of stretched wire measurements based on photogrammetry in the context of CERN

Offset Measurements with respect to stretched wires are traditionally used for accelerator alignments at CERN i.e. for the SPS and the LHC, the position of the wire being measured either by an optical sensor or a capacitive sensor. In recent years the resolution of digital cameras increased so that wires of few tenth of millimetres get visible in images at limited distances of 1-2 m. A method based on photogrammetry is able to measure the reference (wire) and the magnet fiducials simultaneously using the same measurement system. As an optical non-contact method it offers easier possibilities of automation in comparison to the manual procedure employed in the SPS and LHC so far. At the same time other uses of wire measurements like the calibration of wire chambers and detectors seem interesting.

The presented photogrammetric measurements are based on the feature measurement of the commercial software from AICON 3D systems. An evaluation has been done of the wire axis measurement without special signalisation and the magnets fiducials at distances of 1-2 m as for the LHC. For this different hardware components and parameters have been tested like lenses, light conditions or different wires. An estimation of the reachable precision is verified on a dedicated test bench and a scale 1:1 mock-up with respect to the classical offset measurements. The aim is to understand the capacities and constraints of the system that reaches precisions of few hundreds of millimetres in the tested setups.

Summary

Authors: BEHRENS, Antje (CERN); VENDEUVRE, Camille (Institut National des Sciences Appliquees de Strasbourg (FR)); MERGELKUHL, Dirk (CERN)

Presenter: BEHRENS, Antje (CERN)