



Contribution ID: 71

Type: **not specified**

Geodesy and Geodetic Infrastructure

Wednesday 11 April 2018 08:55 (20 minutes)

Geodesy and the associated geodetic infrastructure are essential to all the CERN Survey team activities, and much of it is necessary for the civil engineering teams for new projects too –albeit to a lower precision. The reference systems and the materialisation of those systems, the theoretical location of the new installations in those systems, and fieldwork control installations must all be in place before the civil engineering works can begin.

As for the accelerators and experiments, alignment tolerances drive the geodetic solutions selected, since they can also influence the form of the accelerator lines.

The latest studies and activities will be presented, together with concepts: for the geodetic surface reference and site densification networks; control baselines for gyro-theodolites and electronic distance measurement (EDM) instruments; the transfer of surface point locations into the underground tunnels; and the extension of the CERN reference systems and surfaces across the extended site. A facility for instrument calibration, control and testing, is proposed; adapted for the longer distances over which the Survey team measurement instruments and systems must work. Known issues will be highlighted and some potential solutions presented.

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Session Classification: Infrastructure and operation

Track Classification: I&O