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Latest Results from the CLIC Geodetic Studies

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The alignment challenge presented by the CLIC project require us to look closely at the gravity field and our ability to model the geoid and the influence of tidal and other non-periodic effects. This is of particular importance if we wish to use HLS in the alignment system, and may have a bearing on the use of other instruments too. To examine how the gravity field can directly affect an accelerator's alignment two research projects are currenly underway.
The first is a study of the tidal (and other) effects on measurements made with an HLS. Many factors could affect the alignment of an accelerator over a length of several hundred metres, but we are only interested in those which can produce significant local deformations. An analysis of the contributing factors has been made, different approaches have been considered and tried, and the results to date will be presented.
The second study is to determine the geoidal undulations along a straight line as accurately as possible, and to understand if significant local undulations are even possible. The geoid determination is centered around the use a high precision astro-geodetic camera, coupled with gravimetric measurements at the surface and in a tunnel ~100 m directly below. The first measurement campaign has been completed and the preliminary results will be presented.

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