



## **Linking ring deformations of the Large Hadron Collider to elastic surface loading**

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When operating the Large Hadron Collider (LHC) in Geneva, circumference changes of the main ring can be inferred from the timing measurements with accuracies down to 10 micron. The circumference changes have been shown to correlate with Earth tides and surface mass loading. In this light, the LHC, may provide valuable observational constraints on surface loading problems often encountered in geodesy.

In this presentation, besides showing correlations with surface loading changes from hydrology, and the atmosphere as derived from GRACE, we explore the theoretical framework to deterministically couple the LHC circumference changes to elastic surface loading variations in the region.