



Absolute gravity change and vertical displacement measurements in France for geophysical applications

Anne Barnoud (1), Stéphane Mazzotti (2), and Nicolas Le Moigne (2)

(1) Université Clermont Auvergne, CNRS/IN2P3, LPC, F-63000 Clermont-Ferrand, France

(anne.barnoud@clermont.in2p3.fr), (2) Géosciences Montpellier, UMR5243, Université de Montpellier, Montpellier Cedex 5, France

Temporal absolute gravity variations bring complementary information to vertical displacements observed from GNSS data to study subsurface dynamical processes. Recent developments in gravimetric instrumentation allow measuring high-resolution temporal gravimetric variations that can be used for different geophysical applications (Van Camp et al. 2017). Temporal absolute gravity measurements, combined with GNSS data, can complement the quantification of vertical displacements and help discriminate the sources of the vertical displacements.

Various sites in France have been monitored either continuously over the past years using superconducting gravimeters or repeatedly with absolute FG5 gravimeters. Four superconducting gravimeters are continuously operating for applications related to solid Earth, hydrogeology and atmosphere (Strasbourg, the Larzac plateau, Trappes and the LSBB laboratory). Besides, absolute gravity measurements are repeated with FG5 gravimeters at different sites, mostly for relative gravimeters calibrations and sea level monitoring at tide gauges: Strasbourg, Brest, Calern, Montpellier, Larzac, la Rochelle, Marseille and l'Île d'Aix.

Here, we present a preliminary comparison of the observed gravity changes and associated vertical displacements from GNSS data already available and we discuss the potential of these data to constrain various dynamical processes, such as land uplift and water storage variations.