Geophysical Research Abstracts
Vol. 21, EGU2019-15991, 2019
EGU General Assembly 2019

AQG-A01 : Evaluation of the instrument ; continuous monitoring in laboratory; daily observation at different location

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The first Absolute Quantum Gravimeter AQG-A01 [1] [2] developed by Muquans has been funded in the frame of RESIF (the French Seismologic and Geodetic Network, [3]). In December 2018, after a few years of μdevelopment; the instrument was delivered to RESIF group.
At first AQG-A01 was installed in the Larzac observatory nearby a continuous superconducting gravimeter GWR iGrav [4], a MGL FG5#228 absolute gravimeter is also recording weekly g measurement at the same place. In a second step AQG-A01 and FG5#228 are moved at different indoor gravity station to evaluate the ease of use of this new generation of atomic gravimeter compared to free-fall gravimeter.
Additional gravity measurements are also recorded with MGL-A10 at some place.

In this poster some results of continuous gravity monitoring will be presented in order to evaluate the sensitivity and stability of the AQG as an observatory tool. Daily gravity measurement in different place will evaluate the capacity of the AQG to complete the panel of the existing instrument actually use for studies requiring g measurements. In both case, ease of use and setup and performance of the instrument will be discussed.
We will discuss the performances of the AQG in terms of sensitivity, stability and repeatability of the measurements compared to other existing commercial gravimeter

This paper summarizes the latest results obtained from these experiments. The evaluation of the AQG01 is still in progress but this study confirmed that the AQG01 enables absolute gravity measurements with a sensitivity of 50μGal$\sqrt{}$Hz standard deviation after 1000 s of data integration.

[1] V. Ménoret et al., "Gravity measurements below 10−9 g with a transportable absolute quantum gravimeter", Nature Scientific Reports, vol. 8, 12300 (2018)
[2] P. Vermeulen, Evaluating and comparing the performances of the first units of Absolute Quantum Gravimeter, Abstract EGU 2019
[3] http://www.resif.fr/
[4] B. Fores et al., Assessing the precision of the iGrav superconducting gravimeter for hydrological models and karstic hydrological process identification, GJI (2017)