Review of

Absolute gravity measurements at Brest (France) between 1998 and 2022

authored by

Marie-Françoise Lalancette[1], Guy Wöppelmann[2], Sylvain Lucas[1], Roger Bayer[3], Jean-Daniel Bernard[4], Jean-Paul Boy[5], Nicolas Florsch[2], Jacques Hinderer[5], Nicolas Le Moigne[3], Muriel Llubes[6], Bernard Luck[4], and Didier Rouxel

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Summary of the article:

The authors present a time series of absolute gravimetric observations for the station Shom in the coastal city Brest. These 20 g-values have been measured over a period of 24 years, and are made available now for research application like investigations in sea level change or land uplift. The measured data have been prepared carefully (applying reductions for ocean and Earth's tides, atmospheric fluctuation, polar motion, etc., and editing) to obtain a homogeneous best data set for interdisciplinary research. Meta data and explaining descriptions are provided for future users. Due to the significance of the Brest station for the worldwide tide gauge network, the independent gravimetric series is of crucial importance w.r.t. the ongoing climate change.

Remarks:

I was a little unsure at the beginning because to the partly old references like Carter et al. (1989) or Baker (1993). But I know these old papers partly very well. They are in some way fundamental papers and worth to name them and refer to them. Overall, the reference list is a very good and proper list.

Starting from the beginning:

Line 71: Neilan et al., 1997. In References, I find 1998 and not 1997.

Line 82: I cannot find Lambert et al., 2006, in the references .

Line 159 and 160: It seems that the 700 kg are referred to the 2 FG5s. A single instrument has about half the weight. I would prefer here something like "One FG5 gravimeter weighed about 350 kg" to avoid any confusion.

Line 190, Table 1: I checked in the supplement the data for 01/08/2007, and I found the No sets with 188, but the drops per set are 50 and not 100. I have not checked all the other epochs.

Line 186: “microgal”, not “microGal”

Line 186: “top-of-the-drop height”. Some clear explanation would be helpful here. The top-of-the-drop is the resting position of the testmass at the vertical position z=0 (coordinate system of the data evaluation, positive downwards). The z=0 is important because when you shift the origin of the coordinate system to any other position, you will obtain different g-values. I often used the position of the first data pair (z,t) of the postprocessing as z=0 to avoid other problems.

Line 213: Hinderer and Luck 2005 ?

Line 218/219: “we edited the data . . .”. What means “edited”? Elimination of gross errors?

Line 219: “best one-day gravity value (Table 1)”. As I understand, Table 1 shows the mean g-values of the sets observed over more than one day, which corresponds with the supplement. Do you say here, that the g-values in Table 1 are the best one-day values? This here is confusing.

Line 256: Applying the evaluation software from the FG5 manufacturer, the gravity value from an FG5 is determined . . . .

Line 272: “The transfer of each absolute gravity value from the effective instrumental height (top-of-the-drop) to the common reference height . . .”. The effective instrumental height is not the top-of-the-drop position. Here is the explaining extract from the paper of Wziontek et al. (2021):

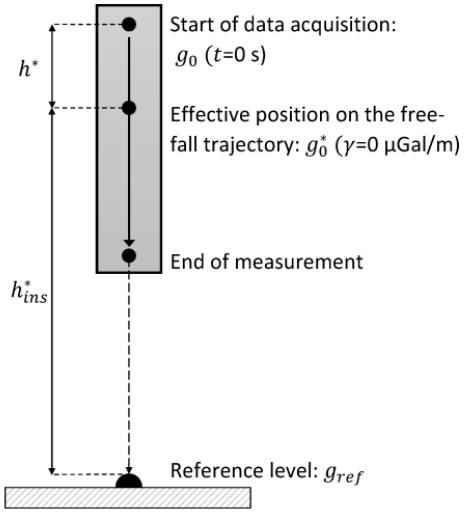

Fig. 1 Schematic representation of the effective position on the free-fall trajectory, where the determined g is independent of the constant VGG γ used within the observation equation of corner-cube gravimeters. The effective measurement height h^* has its origin within the gravimeter itself (start of data acquisition) and depends on the processed section of the zero-crossings. The effective instrumental height h^*_{ins} depends also on the setup of the gravimeter and has to be known to transfer the gravity value to a reference level (usually top of the benchmark) by using a VGG that can differ from γ.

Please read the caption of the figure above. Effec. Instr. Height is close to the 1/3 of the falling distance.

In References, I found 3 references not named in the text: line 488 (Boy and Hinderer2005, line 500 (De Linage 2003), line 574 (Van Camp and Vauterin, 2004).

Line 558: the year of Pugh and Woodworth? 2014?

My recommendation:

After small changes, the article will be ready for publication. The paper ensures sustainability for future investigations. Very good!