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Comment

## ***Interactive comment on “Gravity effect of glacial ablation in the Eastern Alps – observation and modeling” by P. Arneitz et al.***

### **Anonymous Referee #2**

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The authors report the trend observed in gravity measurements at a location in the Austrian Alps over more than 2 decades. Most of the gravity increase is explained by the ablation of the surroundings glaciers due to global warming at the origin of the observed retreat in the Alps. The authors used 3 successive inventories of the glaciers cover to model the gravity effects at the station. They made a remarkable work at using the best modeling and available information to predict the associated gravity trend due to the glaciers ablation. Basically, the authors propose a direct model of the ice masses variations that allows them to explain most of the observed gravity signal. The results are very convincing. Once this has been done, one can ask the question of the usefulness of gravity measurements. Have we learned anything new? The answer is obviously: no! We did not learn anything more about the coverage of glaciers than what the more accurate but less frequent inventories indicate. I advise

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the authors to reflect on the role of gravity measurements. The argument that this will “clarify open questions on geodynamical and seasonal” effects makes little sense when the authors assessed their measurements uncertainty between 60 and 80 nms<sup>-2</sup> ... In the same vein, I am also surprised that the authors do not mention or even try to interpret the four-year cycle of gravity observable in the residuals. Is there a geophysical phenomenon or is it instrumental error? If this is a signal, then it would make sense to continue gravity measurements.

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Interactive comment on The Cryosphere Discuss., 6, 4977, 2012.

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