

Using geodetic measurements to improve estimates of Antarctica's GIA and present-day mass balance

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Publication date

2015

Document Version

Final published version

Citation (APA)

Gunter, B. C., Engels, O., Riva, R., Meister, R., Muir, A., King, M. A., van den Broeke, M. R., Hashemi Farahani, H., Ditmar, P., & More Authors (2015). *Using geodetic measurements to improve estimates of Antarctica's GIA and present-day mass balance*. Abstract from 26th IUGG general assembly, Prague, Czech Republic.

Important note

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JG1 Dynamics of the Cryosphere from Geometric and Gravimetric Observations (IAG, IACS)

24-Jun-2015, 16:30 - 18:00

Abstract content:**Using geodetic measurements to improve estimates of Antarctica's GIA and present-day mass balance**

This presentation will provide an overview and discussion of a methodology in which satellite altimetry, satellite gravimetry, and climate data sets are used to generate empirical estimates of present-day Antarctic glacial isostatic adjustment (GIA), as well as corresponding ice mass change estimates. One of the benefits of this approach is its ability to provide more reliable uncertainties of these estimates based on the error characteristics of the input observations. The resulting empirical GIA uplift rates show both similarities and differences from traditional GIA models based on ice history reconstruction. This presentation will explore some of these differences, in particular for regions such as the Amundsen Sea Sector in West Antarctica and the Phillip/Denman sectors of East Antarctica. Comparisons will also be made between empirical estimates made with a range of satellite gravimetry (GRACE) and satellite altimetry (ICESat, Envisat) data sets. The combinations suggest that the approach has the potential to reduce the uncertainty surrounding both Antarctic GIA and ice mass change estimates and provide new insights into the impact that recent ice load changes may have on present-day uplift rates.

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Keywords:

Antarctica glacial isostatic adjustment mass balance satellite altimetry gravimetry climate data GPS

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