

Assessment of errors and uncertainty patterns in GIA modeling

Barletta, Valentina Roberta; Spada, G.

Published in:
Geophysical Research Abstracts

Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Barletta, V. R., & Spada, G. (2012). Assessment of errors and uncertainty patterns in GIA modeling. Geophysical Research Abstracts, 14, EGU2012-9717.

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



Assessment of errors and uncertainty patterns in GIA modeling

V. R. Barletta (1) and G. Spada (2)

(1) DTU Space, Copenhagen, Denmark (v.r.barletta@gmail.com), (2) Dipartimento di Scienze di Base e Fondamenti, Urbino University, Urbino, Italy

During the last decade many efforts have been devoted to the assessment of global sea level rise and to the determination of the mass balance of continental ice sheets. In this context, the important role of glacial-isostatic adjustment (GIA) has been clearly recognized. Yet, in many cases only one "preferred" GIA model has been used, without any consideration of the possible errors involved. Lacking a rigorous assessment of systematic errors in GIA modeling, the reliability of the results is uncertain. GIA sensitivity and uncertainties associated with the viscosity models have been explored in the literature. However, at least two major sources of errors remain. The first is associated with the ice models, spatial distribution of ice and history of melting (this is especially the case of Antarctica), the second with the numerical implementation of model features relevant to sea level modeling, such as time-evolving shorelines and paleo-coastlines.

In this study we quantify these uncertainties and their propagation in GIA response using a Monte Carlo approach to obtain spatio-temporal patterns of GIA errors. A direct application is the error estimates in ice mass balance in Antarctica and Greenland due to GIA. GIA errors are also important in the far field of previously glaciated areas and in the time evolution of global indicators. In this regard we also account for other possible errors sources which can impact global indicators like the sea level history related to GIA.