Geophysical Research Abstracts
Vol. 18, EGU2016-3648, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

An assessment of the ICE6G_C (VM5A) glacial isostatic adjustment model

Anthony Purcell (1), Paul Tregoning (1), and Amaury Dehecq (2)

(1) Research School of Earth Sciences, Australian National University, Canberra, Australia (anthony.purcell@anu.edu.au), (2) Polytech Annecy-Chambery, BP 80439, 74944 Annecy le Vieux Cedex, France

The recent release of the next-generation global ice history model, *ICE6G_C(VM5a)* [*Peltier et al.*, 2015, *Argus et al.* 2014] is likely to be of interest to a wide range of disciplines including oceanography (sea level studies), space gravity (mass balance studies), glaciology and, of course, geodynamics (Earth rheology studies).

In this presentation I will assess some aspects of the *ICE6G_C(VM5a)* model and the accompanying published data sets. I will demonstrate that the published present-day radial uplift rates are too high along the eastern side of the Antarctic Peninsula (by $\sim$8.6 mm/yr) and beneath the Ross Ice Shelf (by $\sim$5 mm/yr).

Further, the published spherical harmonic coefficients - which are meant to represent the dimensionless present-day changes due to glacial isostatic adjustment (GIA) - will be shown to contain excessive power for degree ≥ 90, to be physically implausible and to not represent accurately the *ICE6G_C(VM5a)* model.

The excessive power in the high degree terms produces erroneous uplift rates when the empirical relationship of *Purcell et al.* [2011] is applied but, when correct Stokes' coefficients are used, the empirical relationship will be shown to produce excellent agreement with the fully rigorous computation of the radial velocity field, subject to the caveats first noted by Purcell et al. [2011].

Finally, a global radial velocity field for the present-day GIA signal, and corresponding Stoke's coefficients will be presented for the ICE6G_C ice model history using the VM5a rheology model. These results have been obtained using the ANU group's *CALSEA* software package and can be used to correct satellite altimetry observations for GIA over oceans and by the space gravity community to separate GIA and present-day mass balance change signals without any of the shortcomings of the previously published data-sets. We denote the new data sets *ICE6G_ANU*.