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Non-uniqueness and ambiguity of GIA solutions

Anthony Purcell (1) and Kurt Lambeck (1,2)

(1) Australian National University, Research School of Earth Sciences, Earth Physics, Acton, Australia (anthony.purcell@anu.edu.au), (2) International Space Science Institute, Berne, Switzerland

Glacial Isostatic Adjustment (GIA) produces an array of physical effects that significantly impact the analysis and interpretation of a broad range of geophysical processes. Consequently, much effort has been dedicated to producing GIA models that are robust, numerically and theoretically accurate and easily incorporated into other geophysical studies. In this process, however, there has been a failure to clearly communicate the uncertainties associated with GIA model outputs or the limitations of the underlying assumptions. GIA processes result from the convolution of ice- and water-loading effects with Earth response. In most cases neither the ice-loading history nor Earth rheology are well-constrained and there is an inherent non-uniqueness in GIA model inversions derived under these conditions. This presentation will discuss the limitations of GIA model products that must be considered in their development, interpretation and application.