



The influence of lateral Earth structure on GIA in Antarctica

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Earth structure beneath Antarctica is strongly heterogeneous and this will influence the solid Earth response to surface loading, as well as potentially the evolution of ice dynamics. In this study we use a suite of rheological models that include vertical and lateral variations in earth properties, as derived from seismic velocity perturbations, to study the solid Earth response to surface load changes during the last glacial cycle. In particular, we investigate the degree to which the inclusion of a local rheological model, derived using data from a seismic array deployed across Antarctic, influences the results.

The W12 Antarctic deglaciation model is used in this study and we find that, in general, predictions for the present-day rate of solid Earth deformation are smaller when lateral variations in Earth structure are included within the GIA model. An important caveat to this is that GIA-related uplift rates may be greater than those predicted using the W12 model if there have been recent (post-2 ka BP) changes in ice loading, particularly in regions which are inferred to have a low upper mantle viscosity.