

Long term crustal movement estimated from glacio-hydro isostatic modeling and relative sea level observation

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Sea level observation can be used to track past crustal movement histories. A large number of studies have been conducted to obtain past sea level change information though quantitative analyses combining them to glacio-hydro isostatic adjustment (GIA) modeling is rarely conducted. Thus, the long term vertical crustal movement estimation, which is an essential data to understand the tectonic stability, has not yet sufficiently been understood.

In this study, we compiled published sea level data (from more than 100 sites) and compare the values with GIA modeled sea level estimation in the past. We also revisited the possible range of rheology parameter of Earth, which is a source of GIA model based sea level uncertainty. Then the data were compared with GIA modeled sea level to evaluate the amounts of vertical tectonic movement from LGM to present.

We also estimated amounts of vertical tectonic movement longer than 100,000 years using the Last Interglacial marine terraces. This was then compared with the one from LGM and found the systematic trend depend of regions.

In this presentation, we discuss possible reason to provide these discrepancies.

Keywords: sea-level change, GIA, coastal terrace, vertical tectonic movement, last interglacial, LGM