

Very Long-term Post-seismic Gravity Changes due probably to Long-term Viscoelastic Relaxation

*Yusaku Tanaka¹

1. ERI, UTokyo

Long-term post-seismic gravity change of the 2004 Sumatra-Andaman earthquake (Mw9.1-9.3) detected by GRACE + GRACE-FO is modeled sufficiently by an exponential function until the 2012 Indian-Ocean earthquake (Mw8.8) but gravity increasing became constant after that. An interpretation is post-seismic gravity change of the 2004 earthquake was almost completed in 2012 and that of the 2012 earthquake proceeded constantly. Assuming this, I calculate their spatial distributions. Post-seismic gravity change of the 2012 earthquake was expanded along the faults of the 2004 earthquake and the peaks of post-seismic gravity changes of the two earthquakes appeared at a same location. This suggests another interpretation, namely, post-seismic gravity change of the 2004 earthquake has another long-term component expected by Burgers rheology and post-seismic gravity change of the 2012 earthquake is slight. Spatial distributions of post-seismic gravity change on this assumption support this interpretation. This also shows Burgers rheology is appropriate to consider the viscosity of upper mantle based only on satellite gravimetry. This does not conflict with post-seismic gravity changes of other earthquakes.

