



ITRF2014 and Earth figure changes: evidence of global viscous relaxation in recent ice melting Earth's response?

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The latest solution of the International Terrestrial Reference Frame, entitled ITRF2014, presents particularly large vertical velocities across Greenland, South East Alaska and the Antarctic Peninsula, compared with the previous solution ITRF2008. We investigate here the geophysical origin of this evolution of the ITRF velocity field. From a selection of ITRF2014 GNSS vertical velocities we determine solid Earth figure changes and Earth's geocenter motion at different dates. By exploring various geophysical models, we show that our estimations can be well explained by the deformation due to Glacial Isostatic Adjustment (GIA) and Recent Ice Melting (RIM). However, we also show that the obtained solid Earth oblateness is not consistent with J_2 -rate observations if we assume purely elastic RIM deformations. We explore here different rheological scenarios that may explain this discrepancy, including low viscosities in the asthenosphere and/or the D'' layer, or possible phase transitions in the mantle transition zone.