



15 years slow deformation in and around Lake Vänern (SW Sweden) deduced from repeated GPS measurements

Faramarz Nilfouroushan (1), Peter Hodacs (1), Christopher Talbot (1), Hemin Koyi (1), and Lars Sjöberg (2)

(1) Uppsala University, Earth Sciences, Uppsala, Sweden (faramarz.nilfouroushan@geo.uu.se, 0046 184712591), (2) Royal Institute of Technology (KTH), Stockholm, Sweden

In this contribution, we present the new geodetic velocity and strain rate fields obtained from GPS surveys around Lake Vänern in southwestern Sweden during the period 1997-2012. The lake Vänern is a graben bounded to the east and west by main N-S striking faults, whereas ENE-WSW striking faults define its northern and southern boundaries. The Värmland GPS network, was setup to monitor the ongoing slow deformation in and around this lake due to tectonic and Glacial Isostatic Adjustment (GIA) processes in Fennoscandia. This network straddles the Protogine and the Mylonite zones and covers one of the most active seismic zones of Sweden.

We use GAMIT-GLOBK software to process the past GPS data, collected in October 1997, and the new GPS data, collected in October 2010, 2011 and 2012. We also integrate our local network with the SWEPOS (Swedish Permanent GPS network) and IGS (International GNSS Service) stations to better constrain the velocity fields in ITRF2008 and Eurasia-fixed reference frames.

The preliminary results obtained from campaign-mode measurements between 1997 and 2011 shows that the eastern part of the network, located on the eastern side of the NS trending Mylonite zone, is deforming relatively faster than the western part. In the eastern part, the overall extensional components trending NW-SE with local variations are observed. To constrain better these preliminary results, we will add the new campaign data collected in October 2012 to the 1997-2011 solutions and present new deformation maps. The 15 years long observation period (1997-2012) can better constrain sub-mm/yr horizontal crustal shortening or extension rates in Sweden, more specifically around Lake Vänern.