

InSAR: NEW CLUSTERING PROCEDURES AND ACTIVE DEFORMATION AREAS (ADA)

The PSI technique can be used to monitor deformations over very wide areas. An example is given by the European coverage achieved by the European Ground Motion Service (EGMS) products. The wide area coverage requires the generation of huge deformation measurement datasets. The analysis of such datasets can be tedious and time consuming.

In this context, GeoKinesia and the CTTC (Centre Tecnològic de Telecomunicacions de Catalunya) have proposed a data clustering procedure to filter and reduce the volume of large PSI datasets. This has the objective to facilitate the interpretation and exploitation of such datasets, especially for PSI nonexpert users. The original approach is described in Barra, Solari, Béjar-Pizarro, Monserrat, et al. (2017): “A methodology to detect and update active deformation areas based on Sentinel-1 SAR images”, Remote sensing, 9(10), 1002.

Starting from the PSI products, this method identifies clusters of neighbouring measurement points or ADAs (Active Deformation Areas) with deformation velocities above a specified threshold. Each ADA is assigned a quality index, which accounts for the noise of the deformation time series and the spatial homogeneity of the clustered measurement point deformations.

GeoKinesia and the CTTC have generated a Europe-wide map (European ADA web map), derived from filtering the EGMS Basic data of the baseline EGMS dataset. This map allows users to focus directly on the active deformation areas with absolute deformation velocities exceeding 5 mm/yr. The map is accessible via a webmap at <http://groundmotionADAs.com>.

Below we show an example of the European ADA map over the port of Barcelona. Each ADA corresponds to a polygon, colour-coded according to its velocity. This map includes a deformation time series representative of each ADA.

