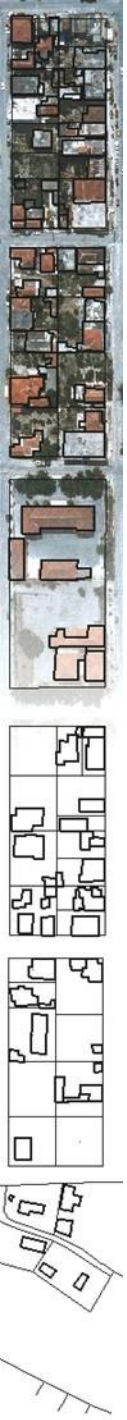


KTIMATOLOGIO S.A.

National Report of Greece

M. Gianniou, D. Mastoris, I. Stavropoulou
KTIMATOLOGIO S.A. (Hellenic Cadastre)

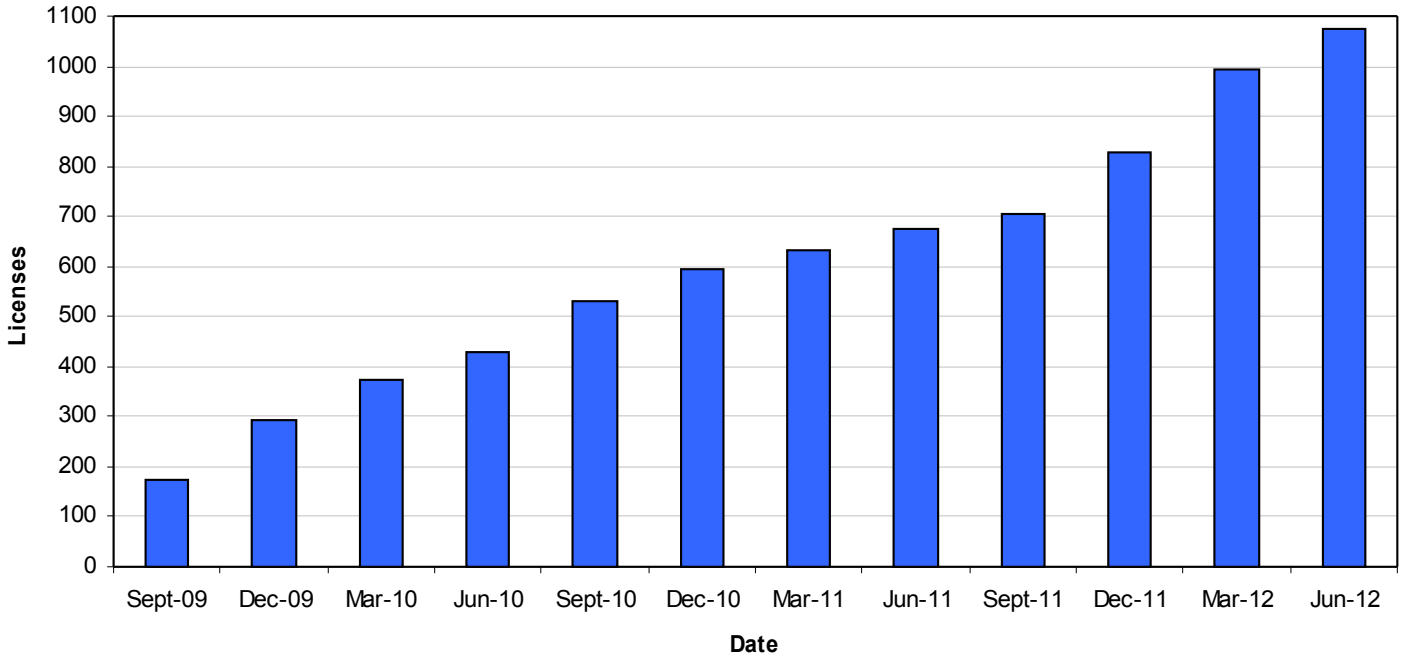
Outline

1. Operation of HEPOS
2. Evaluation of HEPOS transformation model
3. Evaluation of HEPOS geoid model
4. Assessment of ionospheric influence on network-RTK
5. Observation of co-seismic dynamic displacements

1. Operation of HEPOS

HEPOS
HEllenic POsitioning System

- **HEPOS services are available to the users since 25/5/2009**
- **The number of users steadily increases**



2. Evaluation of HEPOS transformation and geoid model

HEPOS is progressively being used by an increasing number of professional geoscientists.

The transformation model from ETRS89 (HTRS07) to the national system (GGRS87) and the HEPOS geoid model are widely used.

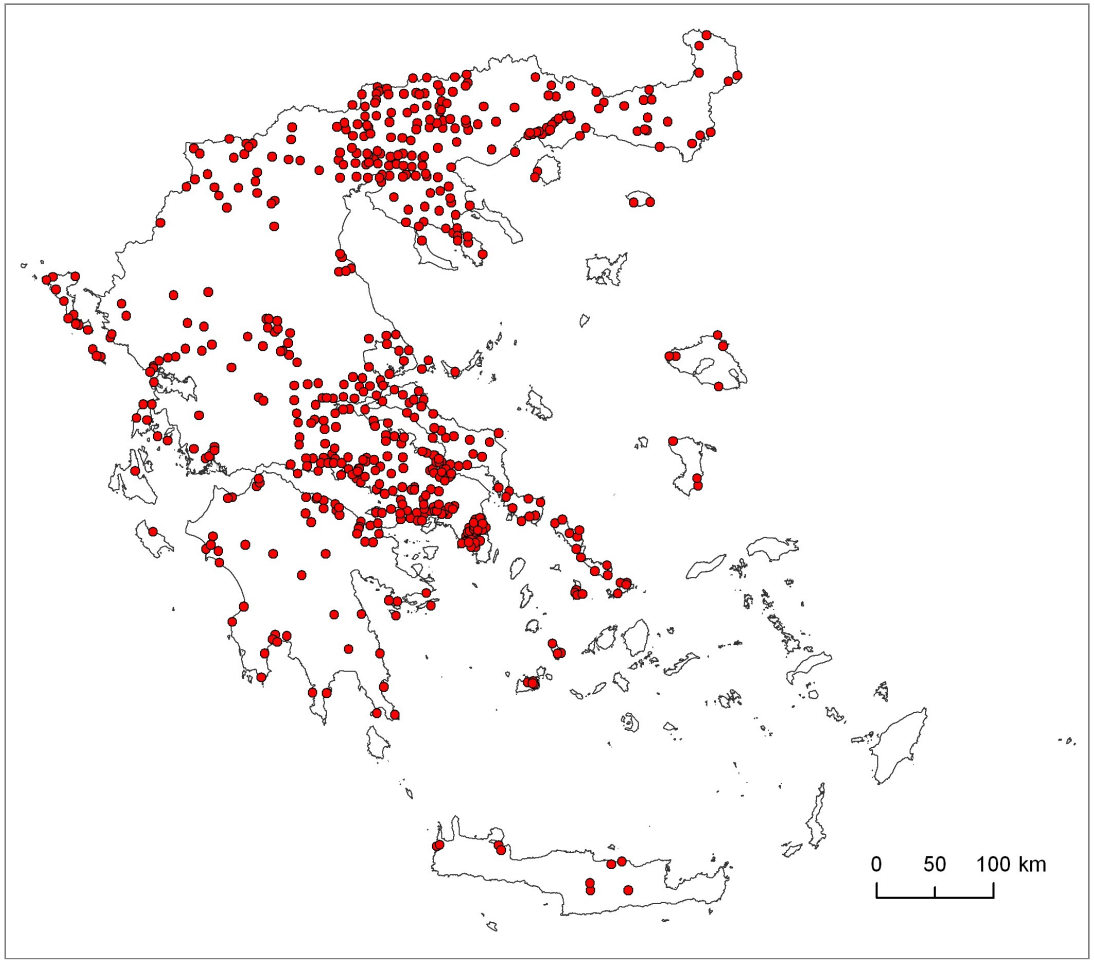
KTIMATOLOGIO S.A. started a project for the evaluation of the two models using measurements on benchmarks of the national triangulation and leveling networks.

Up to now, we evaluated measurements on 621 points:
436 from KTIMATOLOGIO S.A. projects and 185 from academic institutions (AUTH, NTUA, TEI of Athens, TUC).

In the following, the intermediate results are given.

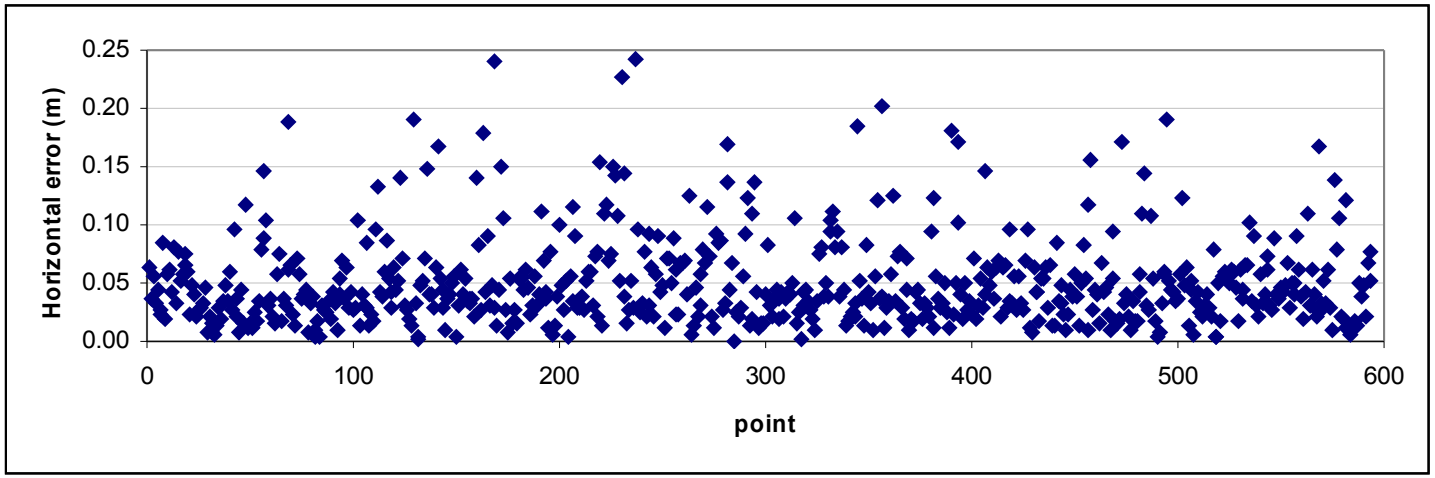
2. Evaluation of HEPOS transformation model

For the evaluation of the transformation model, 594 points were used.



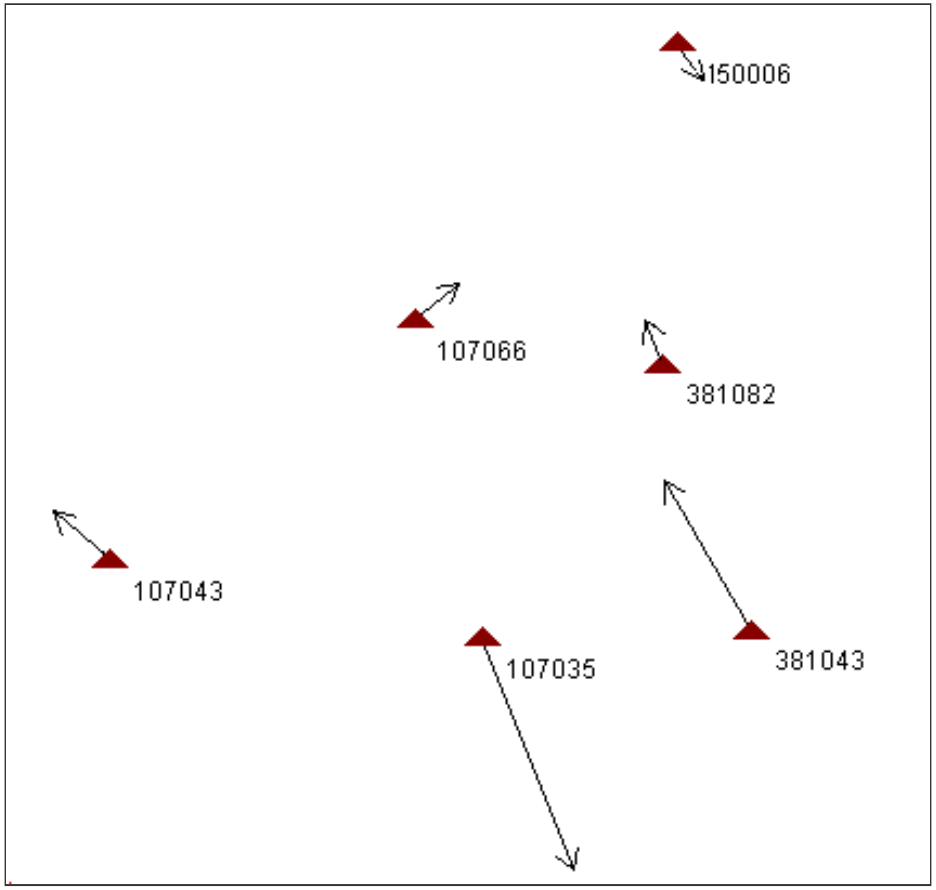
2. Evaluation of HEPOS transformation model

Horizontal errors



Statistics of horizontal errors (m)					
Min	Max	Percentiles			
		50th	90th	95th	99th
0.001	0.242	0.040	0.097	0.133	0.188

2. Evaluation of HEPOS transformation model

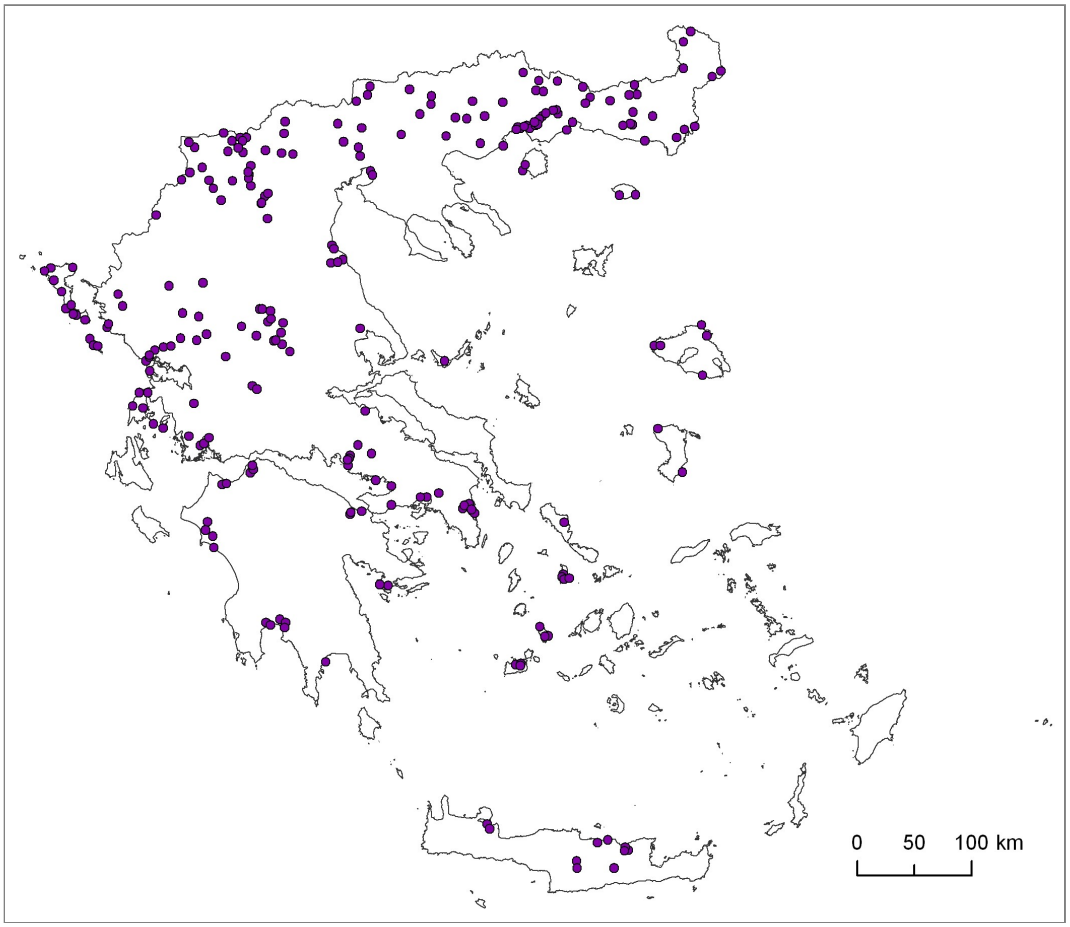


Points showing increased transformation errors have been further investigated by means of local similarity transformations.

In most cases these control points (e.g. point 107035) proved to be problematic benchmarks, inherently inconsistent to their neighboring ones.

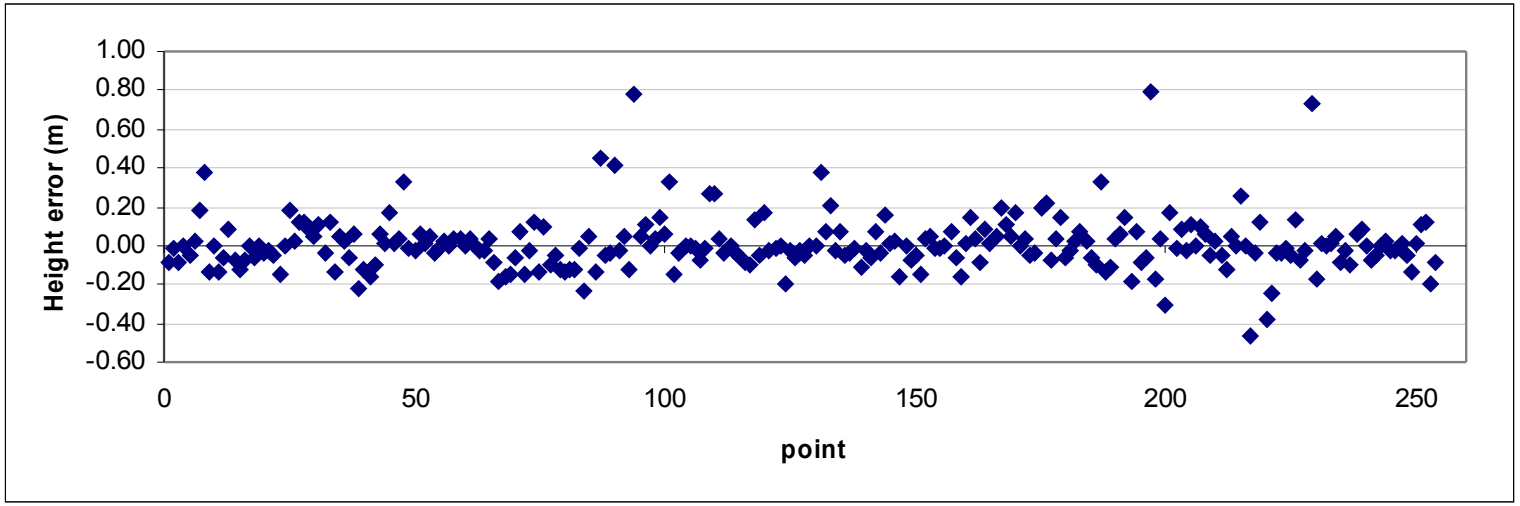
3. Evaluation of HEPOS geoid model

For the evaluation of the HEPOS geoid model, 254 points were used.

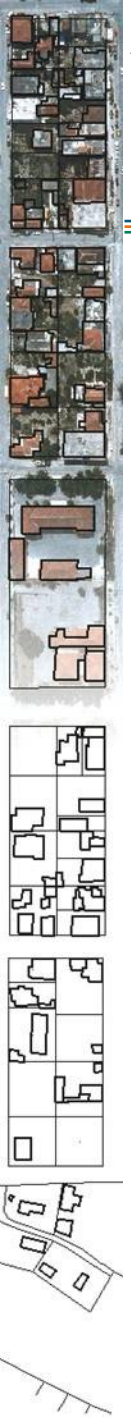


3. Evaluation of HEPOS geoid model

Height errors



Statistics of height errors (m)					
Min	Max	Percentiles			
		50th	90th	95th	99th
0.001	0.793	0.056	0.187	0.269	0.460



4. Assessment of ionospheric influence on network-RTK

As we are approaching the maximum of the 24th solar cycle, HEPOS users often need longer initialization times than in the previous years.

In some cases, mainly under unfavourable conditions (poor DOP, bad signal reception, long distance to the reference stations) initialization cannot be achieved.

Several tests have been made to verify the relationship between longer initialization time and ionospheric activity.

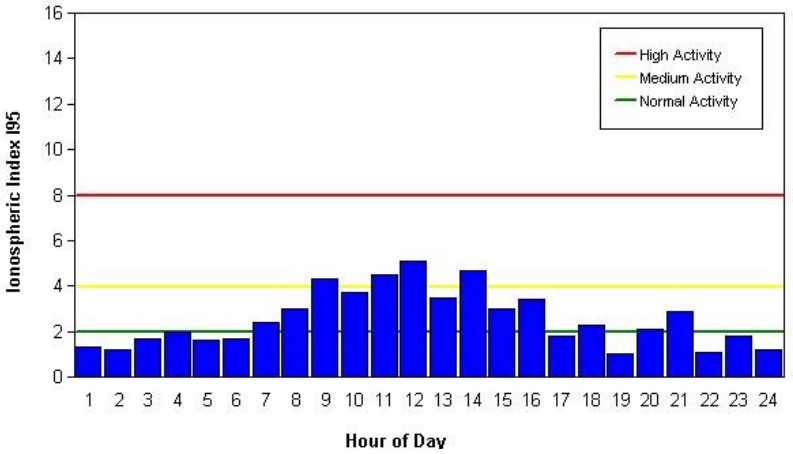
The initialization time was assessed by means of:

- **RTK field measurements**
- **Post-processing using RTK algorithms.**

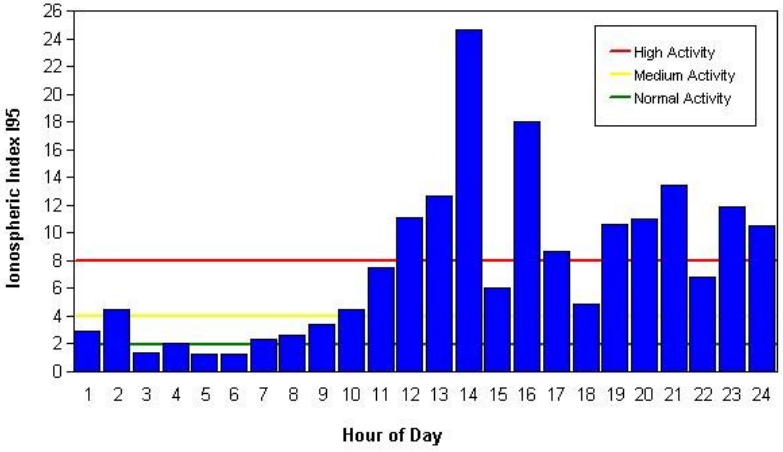
4. Assessment of ionospheric influence on network-RTK

I95 index for VRS Sub-network of Crete

19.3.2012



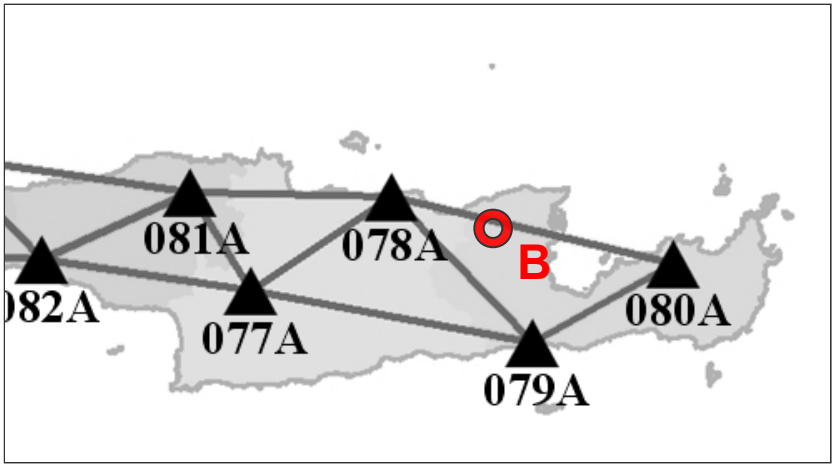
21.3.2012



4. Assessment of ionospheric influence on network-RTK

Post-processing test (location B)

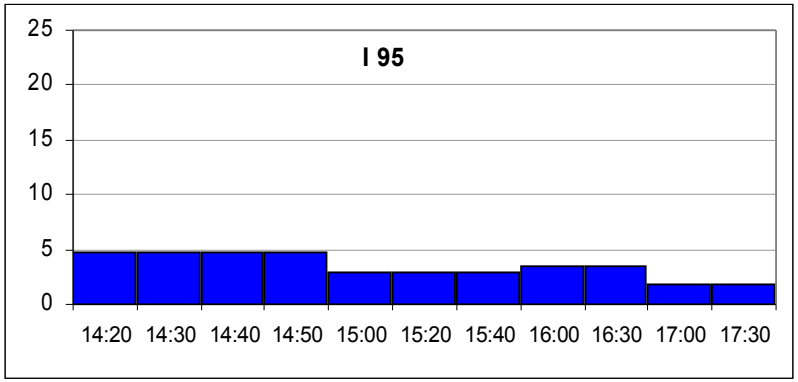
- VRS created close to the network boundaries (eastern Crete)
- VRS solved from station 078A (25 Km)
- Several initializations at different hours of days 19.3.2012 and 21.4.2012
- Results examined along with l95 values

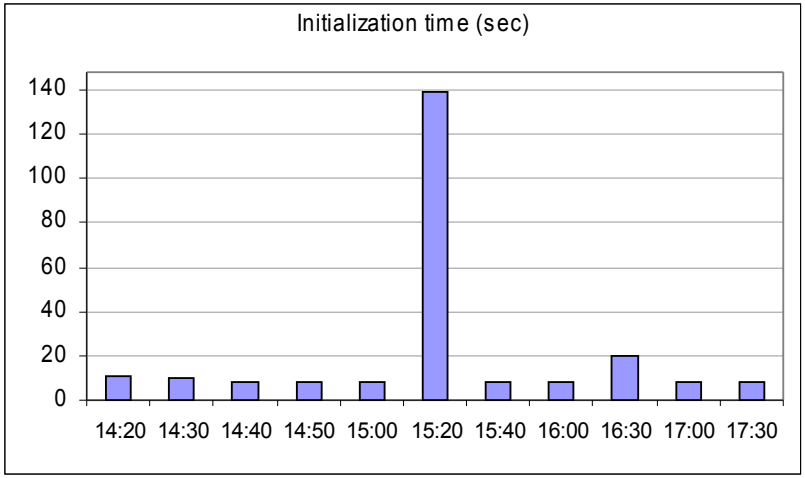


4. Assessment of ionospheric influence on network-RTK

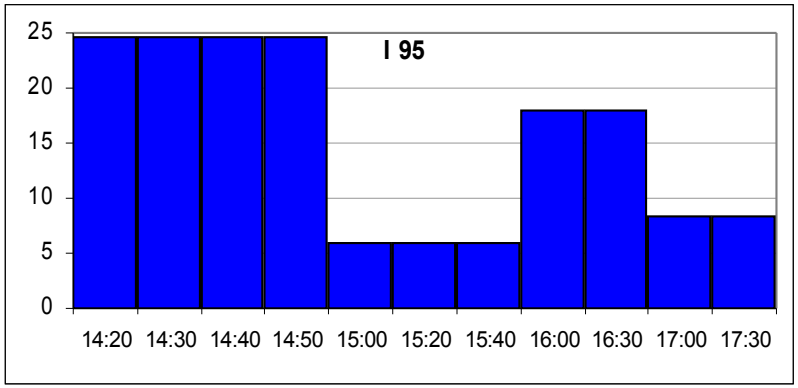
I95 index ~ PPK Initialization time at point B

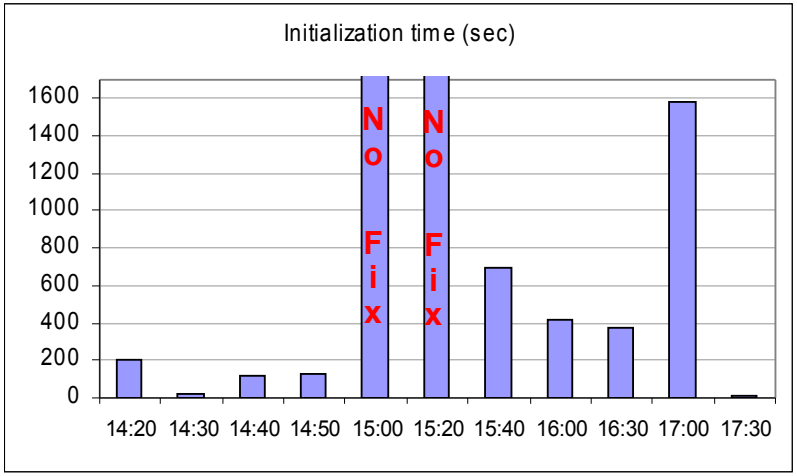
19.3.2012





21.3.2012





5. Observation of co-seismic dynamic displacements

The June 8, 2008 (western Greece) earthquake:

Mw: 6.4

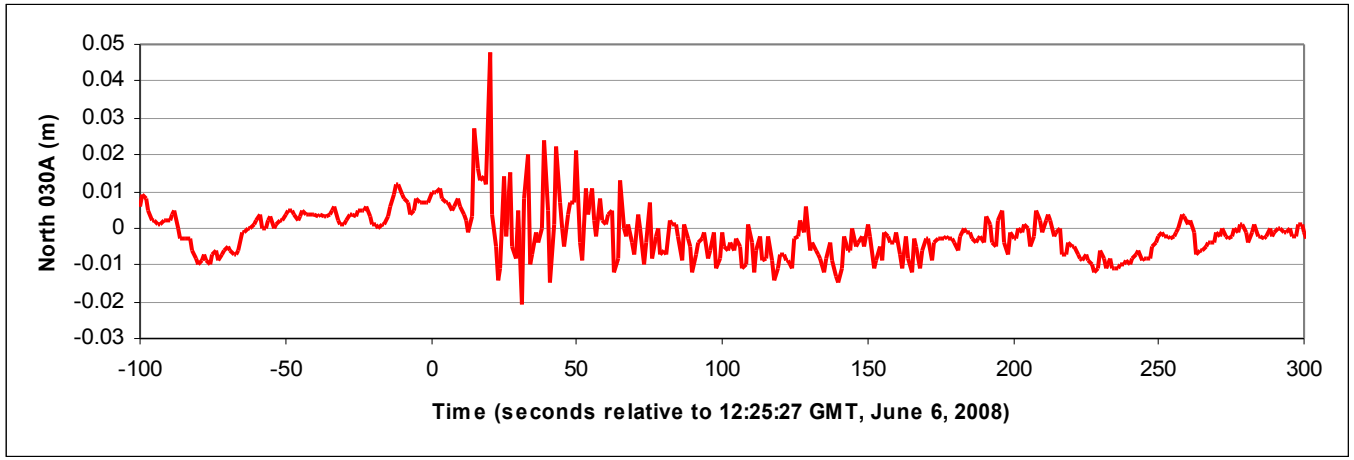
Depth: 25 Km

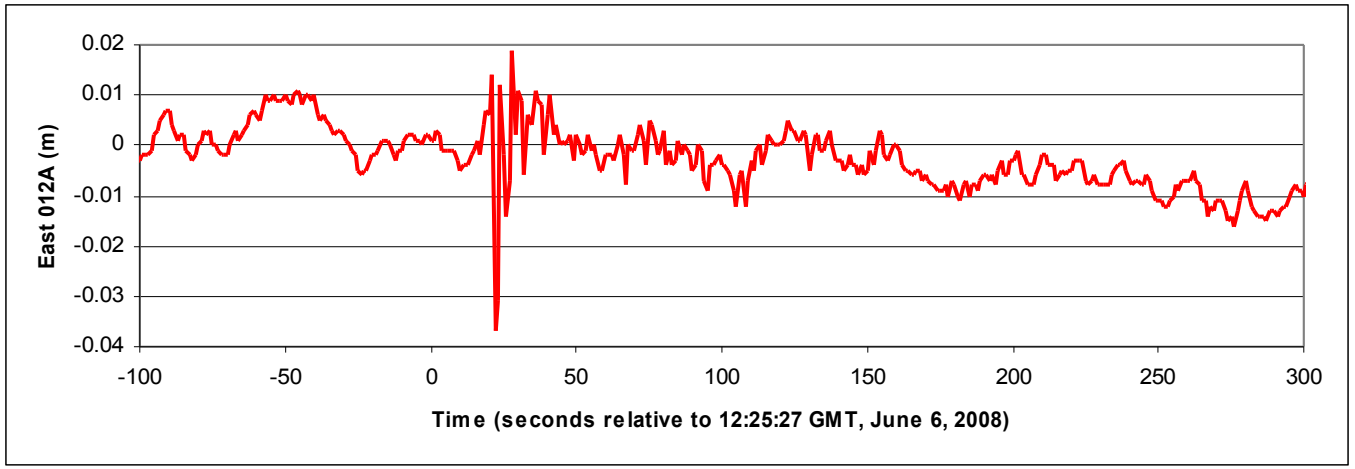
Red star: epicentre
Triangles: HEPOS stations
Green lines: Baselines solved

To detect possible dynamic displacements the 1-Hz data from HEPOS stations were processed with GAMIT/TRACK. Station 001A used as base station to form the baselines.

5. Observation of co-seismic dynamic displacements

Estimated dynamic displacements





Acknowledgments

HEPOS
HEllenic POsitioning System

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