

THE RAP NET: A GEODETIC POSITIONING NETWORK FOR ANDALUSIA (SOUTH SPAIN)

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NETWORK OBJECTIVES

- To constitute the geodetic reference frame to Andalusia.
- To provide GPS data to post-processing.
- To broadcast differential corrections (code and carrier) via Internet and GSM. The stations at the eight Andalusian capitals and Algeciras (Cadiz) can also broadcast the corrections via radio.

NETWORK DESIGN

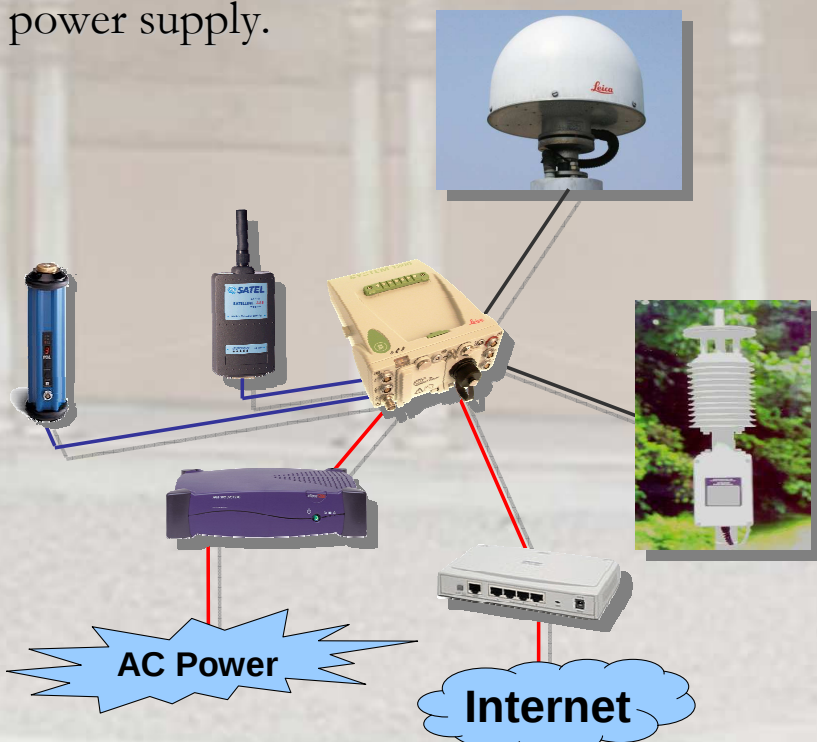
Permanent stations:

Status	Type
Operative	1st. Stage
Not Operative	2nd. Stage



STATIONS EQUIPMENT

- Antenna Geodetic Choke-Ring (Dorne-Margolin), AT504 in the first stage and geodetic antenna in the second one.
- Double frequency receivers.
- Meteorological station (pressure, humidity and temperature) only in the first stage.
- 2 Radio-modem: PacificCrest and Sateline3AS in the first stage.
- Continuous Internet connexion and power supply.

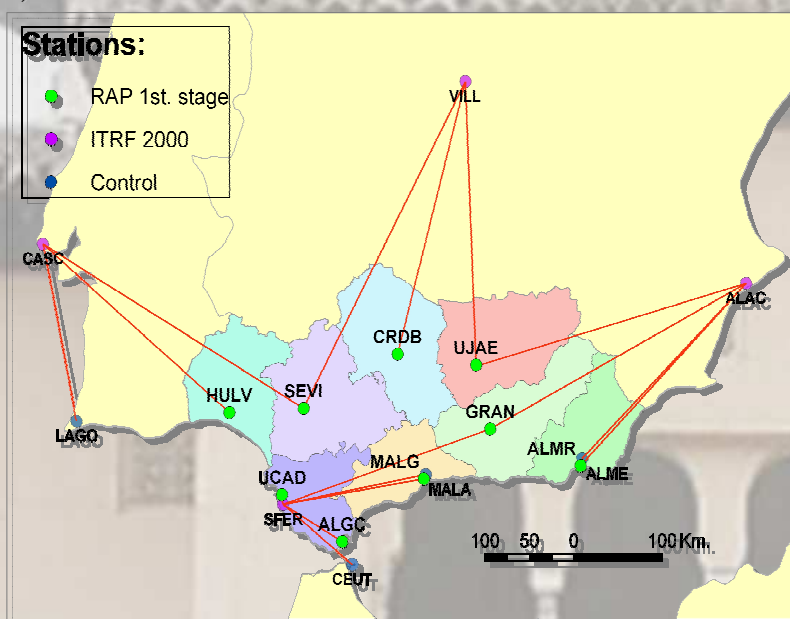


NETWORK SOLUTION AND ADJUSTMENT

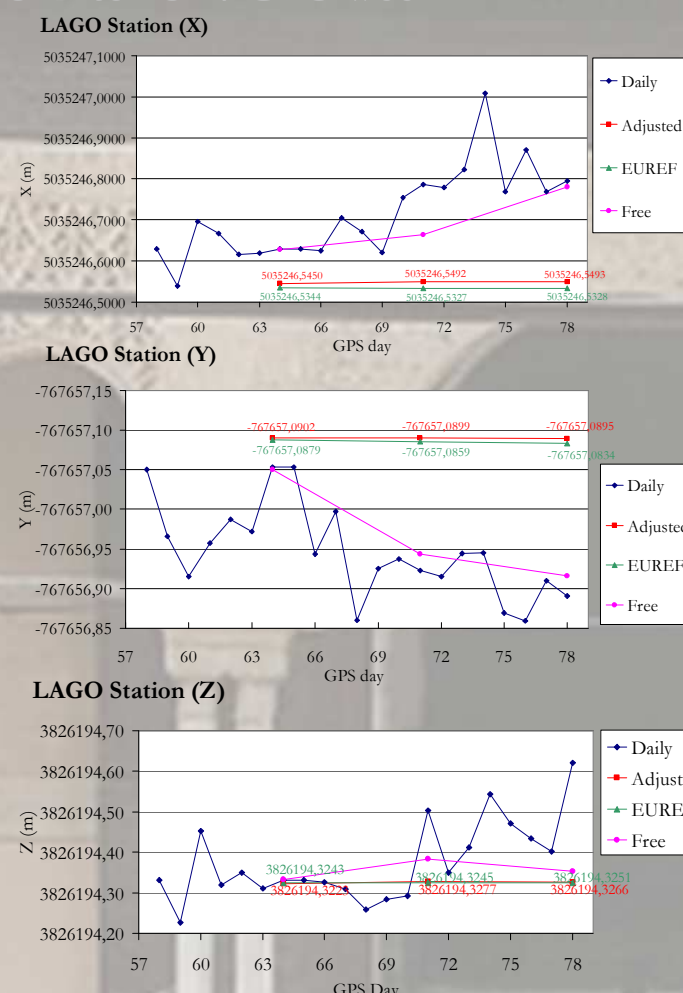
Data have been processed using the BERNESE 5.0 GPS Software.

SFER, ALAC, CASC y VILL with ITRF 2000 coordinates are set to be fixed in the processing. CEUT, LAGO, COBA y ALME from the EUREF network have been included as control stations.

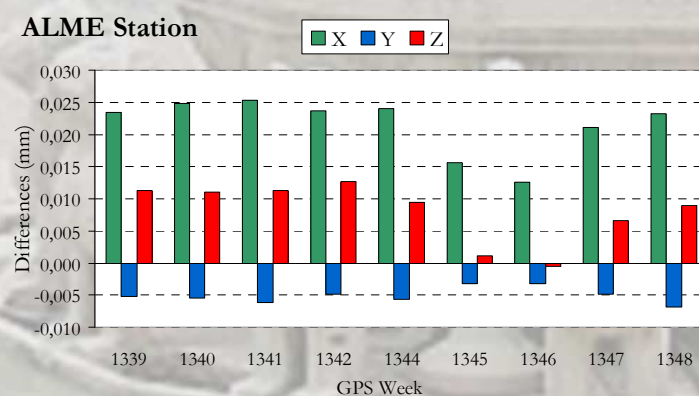
The followed strategy is the one proposed by EUREF and IGS for the solution and adjustment of their networks.



In the following figures it is displayed the daily solution coordinates and some examples of the comparison of our adjustment to the EUREF solution from 1312 to 1314 GPS week.



Differences between EUREF coordinates and the obtained by the RAP processing strategy for the ALME (Almería) station from 1339 to 1349 GPS week:



COORDINATES REFERED TO ITRF 2000

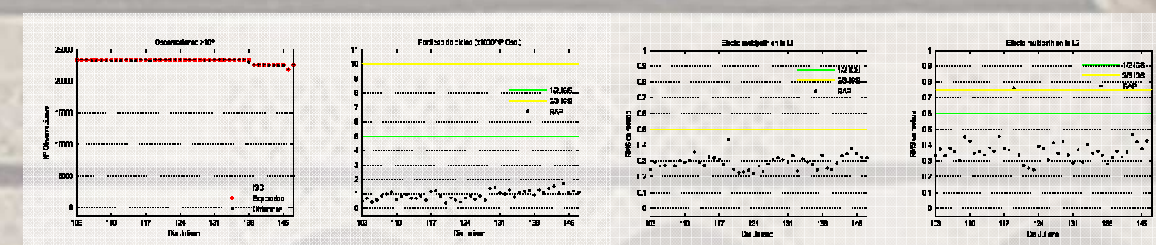
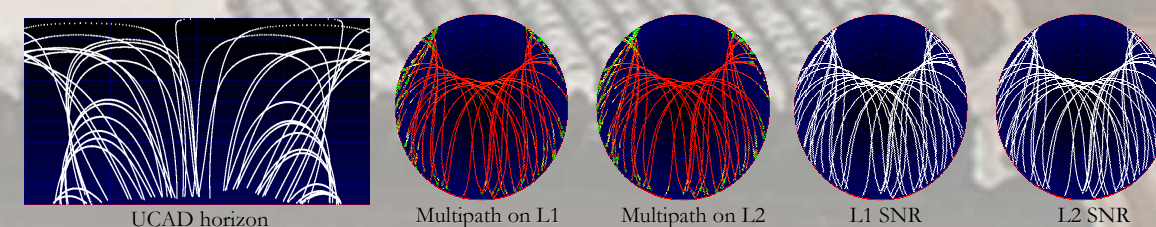
STATION	ID	Installed	X	Y	Z	σ_x	σ_y	σ_z
Algeciras	ALGC	2006/03/22	5135570.5493	-489449.4049	3738222.0365	0.0003	0.0001	0.0002
Almería	ALMR	2006/03/15	5104673.8004	-217597.5929	3805329.8906	0.0003	0.0001	0.0001
Cádiz	UCAD	2005/02/18	5101056.5109	-555223.4339	3775752.9067	0.0003	0.0001	0.0002
Granada	GRAN	2005/11/10	5077906.4123	-319058.4116	3834733.4975	0.0010	0.0003	0.0007
Huelva	HULV	2006/01/16	5044358.0019	-611644.0335	3842260.2361	0.0003	0.0001	0.0002
Jaén	UJAE	2005/03/29	5036324.9782	-332898.8341	3887177.3685	0.0004	0.0001	0.0003
Córdoba	CRDB	2006/02/22	5023360.5628	-420749.1433	3894832.2680	*Using Precise Point Position		
Málaga	MLGA	2006/02/23	5103686.6942	-395880.1592	3792209.2307	*Using Precise Point Position		
Sevilla	SEVI	2006/03/23	5049343.8840	-528173.4171	3848027.0886	*Using Precise Point Position		

* Due to technicals problems of temporal character in these stations, it was not possible the processing of them with the baselines adjustment model and it would be necessary the use of the PPP strategy.

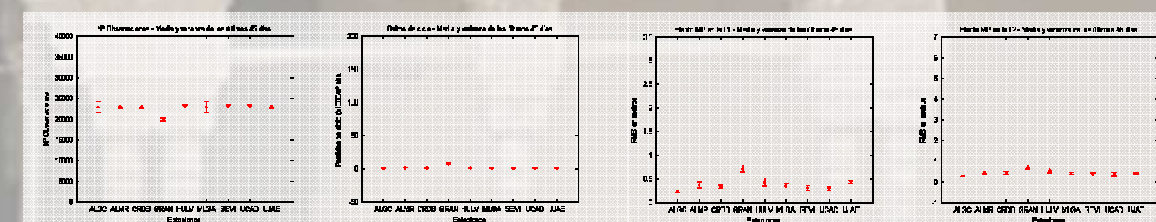
QUALITY CONTROL:

The quality of the network is continuously checked according to the procedure followed by EUREF and IGS wich use the free software TEQC by UNAVCO and QC2SKY by Marco Roggero from II Facoltà di Ingegneria del Politecnico di Torino. It is also used a software designed and developed by the Laboratory of Astronomy, Geodesy and Cartography.

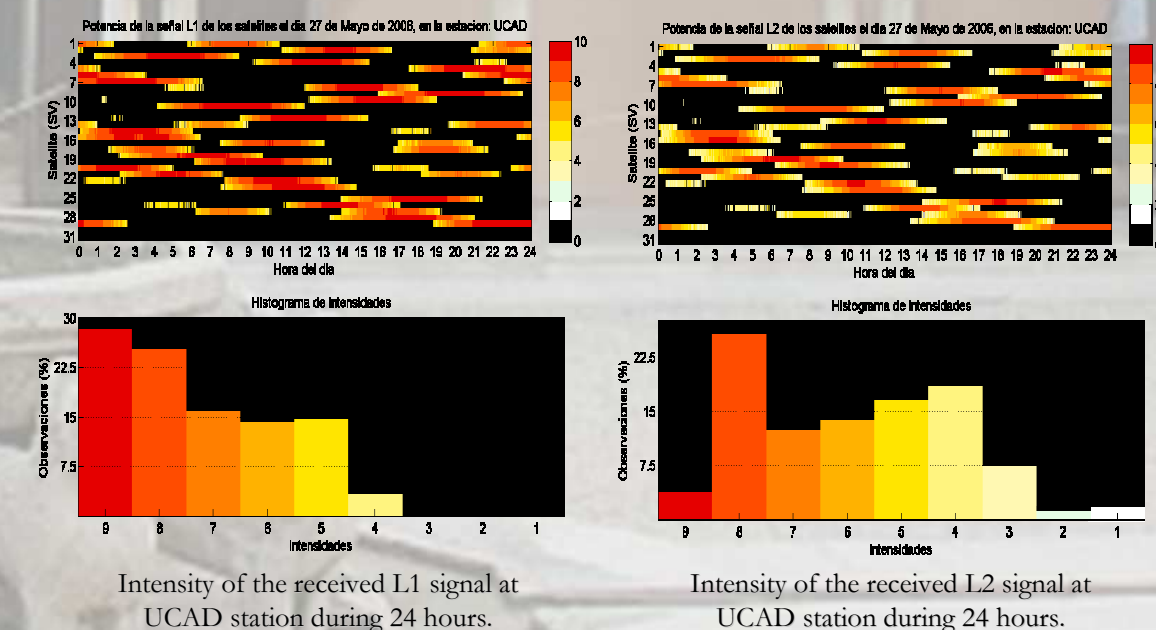
Some of the obtained graphics for the quality control of the UCAD station are shown below.



Expected and obtained number of observations, cycle slips, multipath on L1 and multipath on L2 for UCAD station during a 45 days long period.



45-day average value of the RAP stations.



Intensity of the received L1 signal at UCAD station during 24 hours.

Intensity of the received L2 signal at UCAD station during 24 hours.

Background image: Patio de los leones, Alhambra de Granada (GRANADA)