The Analysis of the Italian GNSS Network at the University of Padova: ETRS89 densification and Scientific GNSS Backbone Network for Italy.

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- Network organization
- Network data management and processing for EPN Densification
- Time series, velocities
- Strain rate on seismogenic faults
- Conclusions

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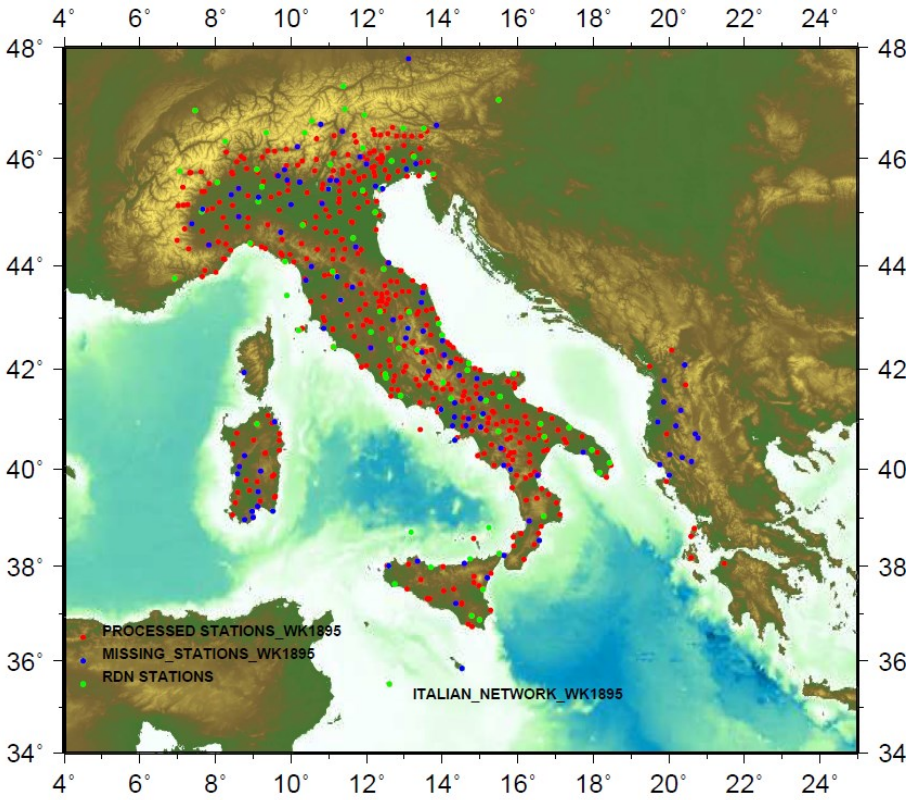
RINEX data are polled daily from a variety of FTP repositories in Italy and neighboring areas

- BKG
- BEV
- ASI
- IGMI-RDN (Rete Dinamica Nazionale)
- TPOS (Provincia Autonoma di Trento)
- STPOS (Provincia Autonoma di Bolzano)
- SMARTNET (Rete GNSS nazionale Leica Geosystems)
- NETGEO (Rete GNSS nazionale Topcon)
- SPIN (Rete interregionale GNSS Piemonte-Lombardia)
- Rete GNSS Regione Abruzzo
- Rete GNSS Regione Puglia
- Rete GNSS Regione Umbria (in progress)
- Rete GNSS Regione Friuli Venezia Giulia
- Rete GNSS INOGS
- INGV (Istituto Nazionale di Geofisica e Vulcanologia)
- Rete GNSS NOA (Grecia)
- Rete IGEWE (Albania)
- Rete ALBPOS (Albania)



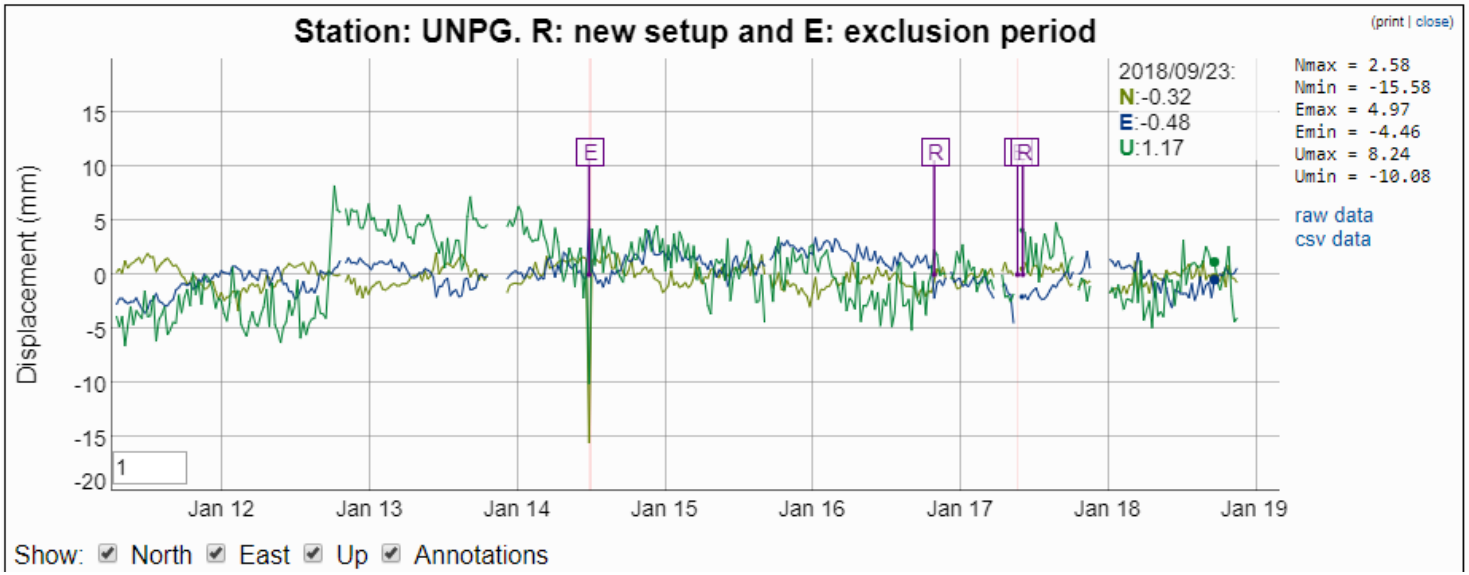
Data management for the Italian network

- Repository
- Densification of Rete Dinamica Nazionale (RDN)
- Time series and update of the velocities (weekly)
- Logfile management (IGS style):
  - Daily check Rinex header/ Logsheet -> diagnostic mail to station manager
  - Validation of 4 char ID against IGN data base (thanks to Bruno Gayrat!)
  - Keep track of which site we downolad from which FTP server
- Daily processing is Rapid/Final IGS orbits
- Check that estimated coordinates agree with the predicted ones -> diagnostic mail to station manager
- Publish weekly Bullettin with updated coordinates (Geodetic and UTM, ETRF2000/WGS84)
- Send results to the WGs of EUREF
- Stack new NQ0 to the previous ones and update coordinates, velocities, solution numbers (if necessary)
- Update Web site

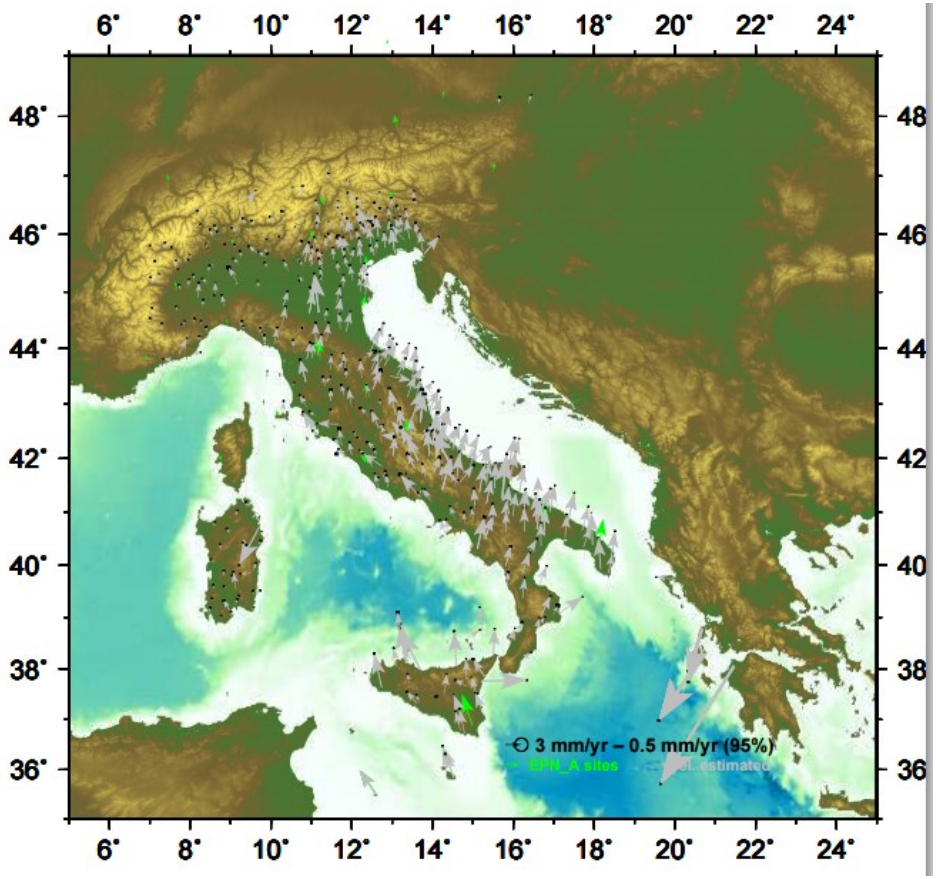
- Management of RTK network of Regione Veneto (30 sites G+G, free)

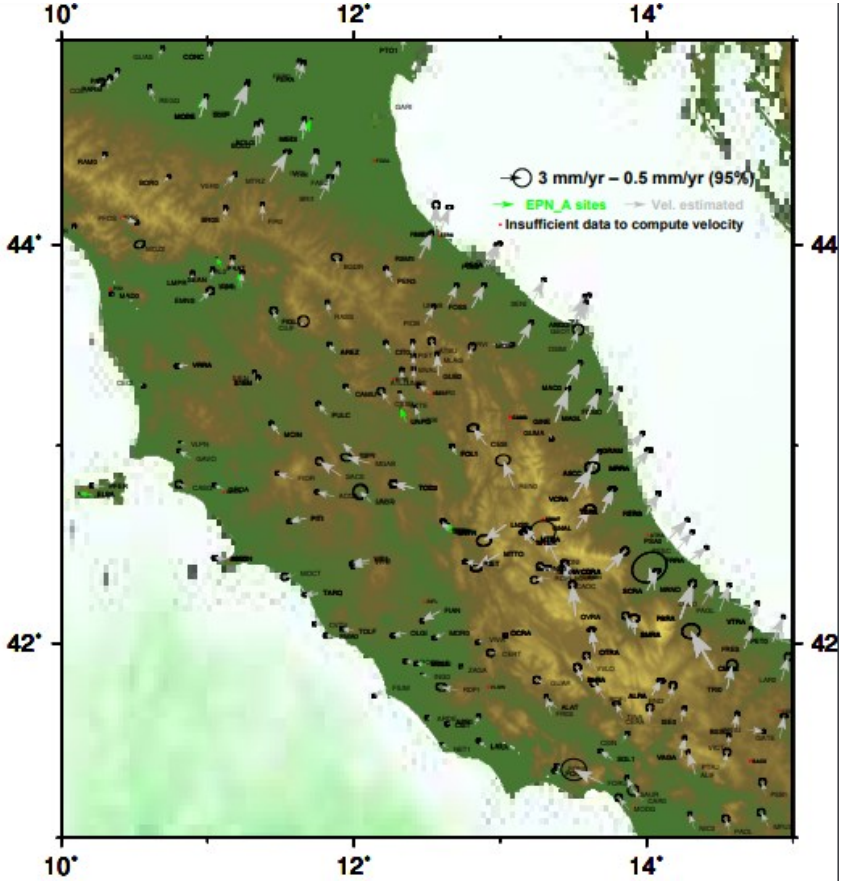
Time series

- Analysis of the time series (semi-automated) since gpswk 1632 (IGb08 compliant)
  - Detect offsets of more than 3 sigma
  - Decide on RESET new solution number
  - Decide on REMOVE
  - Graphics linked to STA file (important!)

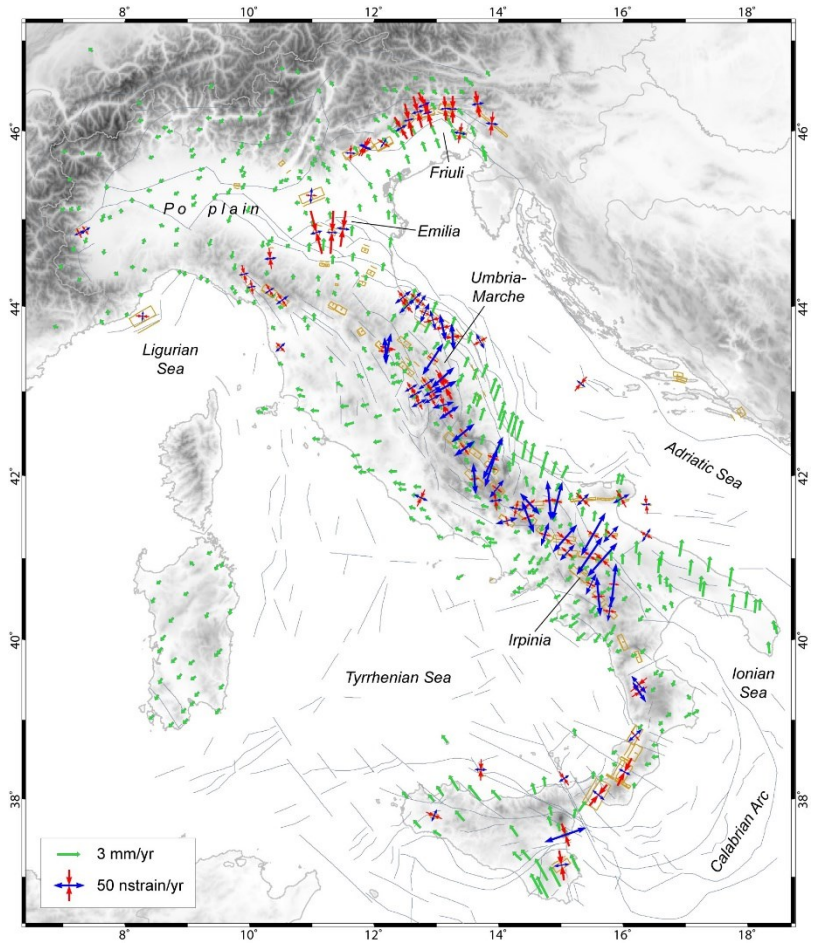


Update velocities in 3D





How does stress build up on seismogenic faults?



Regional Coulomb stress change in the Central Apennines from a GNSS dense velocity field 1300 - 2000

Animation 1 Manuscript

A time dependent model of elastic stress
in the Central Apennines, Italy

A. Caporali, J. Zurutuza and M. Bertocco

December 2018

Conclusion:

- Dense (660+) GNSS network within the EPN: compliance with EPN standards
- Maintenance of coordinates, logsheets. Mountpoints of regional RTK networks can be updated.
- Updates of velocities, eigenvectors of strain rate matrix is computed at the epicenters of known seismic events.
- Monitor how well faults absorb energy from the regional stress field

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