GNSS network PPGNet in Greece – actual status and first results

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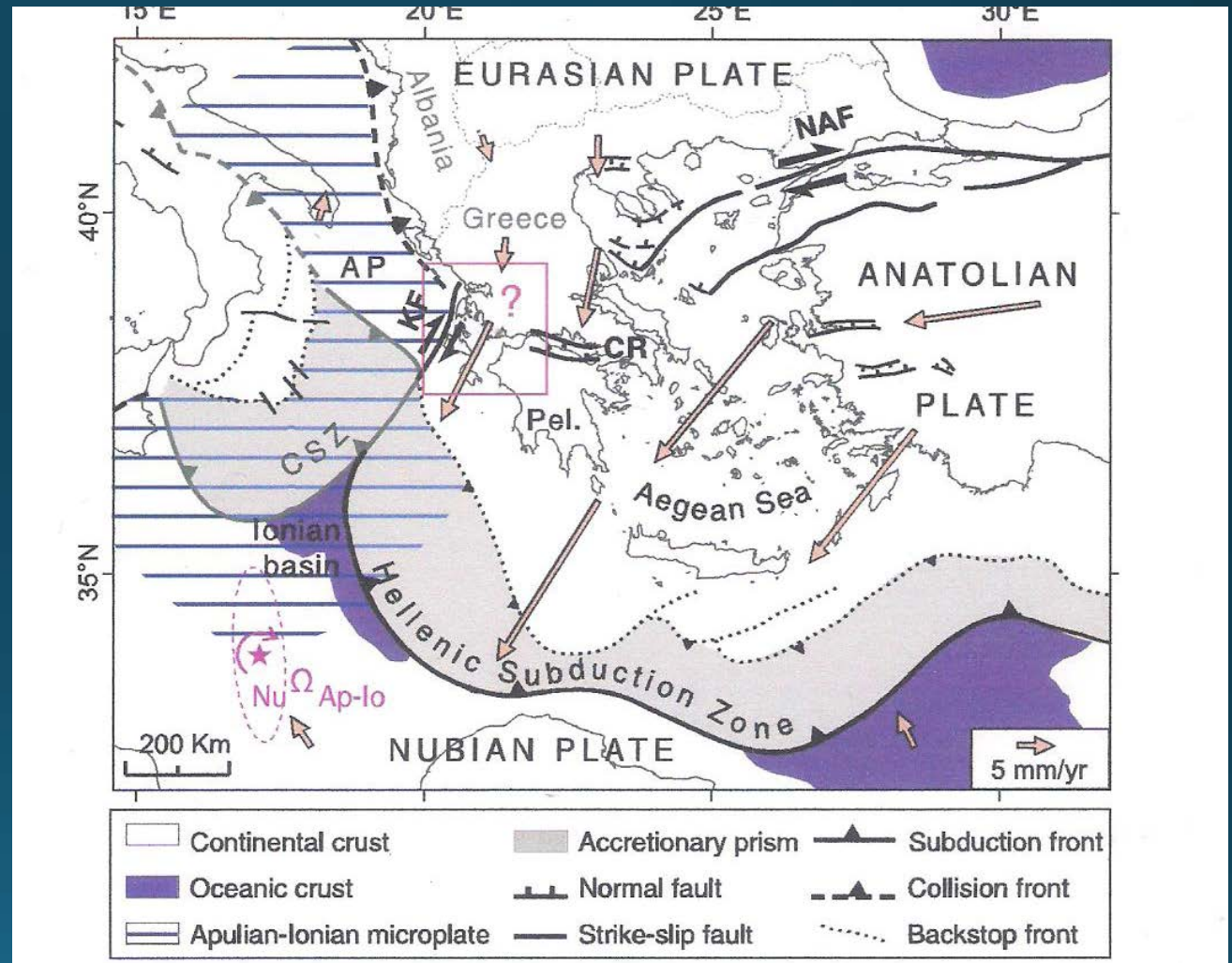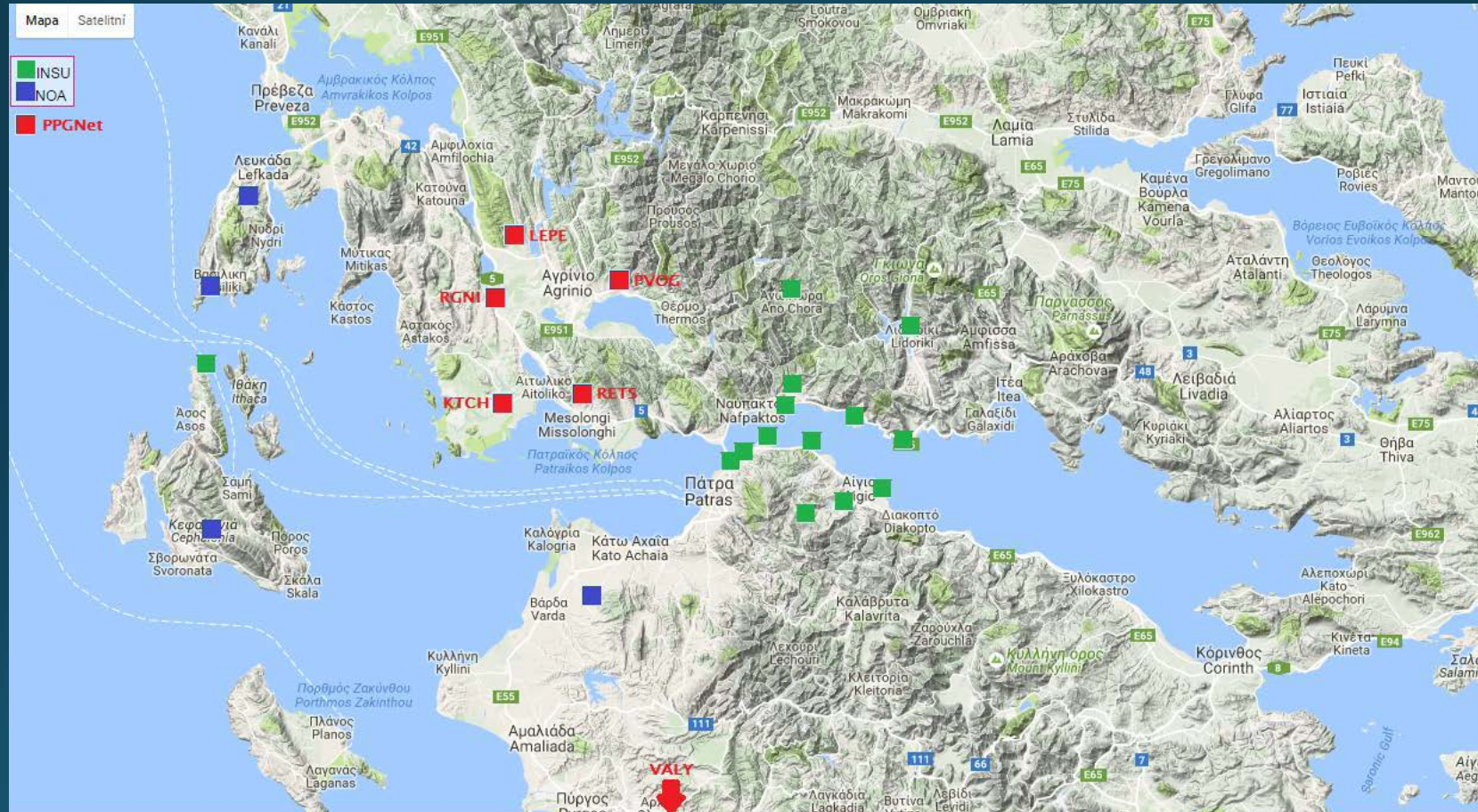
CzechGeo workshop, 2018-12-05

Tectonic situation

Geodynamic setting of Greece AP: Apulian Platform; CR: Corinth Rift; CSZ: Calabrian Subduction Zone; KF: Kefalonia Fault; NAF: North Anatolian Fault, KSF: Katouna-Stamna fault, AE: Achaia-Elia fault, modified from Pérouse et al., 2017.

Network of GNSS station PPGNet

Locations in municipial, school and health centre buildings

PPGNet data and goals

- First data: 2011 (VALY), …, 2014 (RGNI)
- Hourly and daily files in RINEX format
- 30 seconds/daily files are available free, short sampling rate upon request in the frame of CzechGeo/EPOS project
- Data Exchange:
- National Observatory of Athens – reciprocally data from 4 stations – PLAT, PYLO, RLSO, SPAN
- METRICA Company – reciprocally data from 6 stations – AGRI, KALM, KARP, KOPA, PATR, PYRG
- Goals:
- 10 Hz data for seismic/co-seismic events („GPS-seismograms")
- determination of station velocities

GNSS hardware upgrade – before 11/2018

Station	Location	Receiver	Antena	GNSS systems	Sampling rate	Real-time
KTCH	Katochi	Leica GR10	Leica AR10	GPS+GLO+GAL	10 Hz	YES
LEPE	Lepenou	Leica GR10	Leica AR10	GPS+GLO+GAL	10 Hz	YES
PVOG	Paravola	Leica GR10	Leica AR10	GPS+GLO+GAL	10 Hz	YES
RETS	Kato Retsina	Septentrio PolaRx2	Trimble Zephyr Geodetic	GPS	1 Hz	YES
RGNI	Rigani	Septentrio PolaRx2	Trimble Zephyr Geodetic	GPS	1 Hz	NO
VALY	Valyra	Trimble 4700	Trimble Choke Ring	GPS	1 Hz	NO

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LEPE	Lepenou	Leica GR10	Leica AR10	GPS+GLO+GAL	10 Hz	YES
PVOG	Paravola	**Septentrio PolaRx5**	**Septentrio Choke Ring**	**GPS+GLO+GAL +BDS+IRN**	**10 Hz**	YES
RETS	Kato Retsina	**Septentrio PolaRx5**	**Septentrio Choke Ring**	**GPS+GLO+GAL +BDS+IRN**	**10 Hz**	YES
RGNI	Rigani	**Septentrio PolaRx5**	**Septentrio Choke Ring**	**GPS+GLO+GAL +BDS+IRN**	**10 Hz**	**YES**
VALY	Valyra	**Leica GR10**	**Leica AR10**	**GPS+GLO+GAL**	**10 Hz**	**YES**

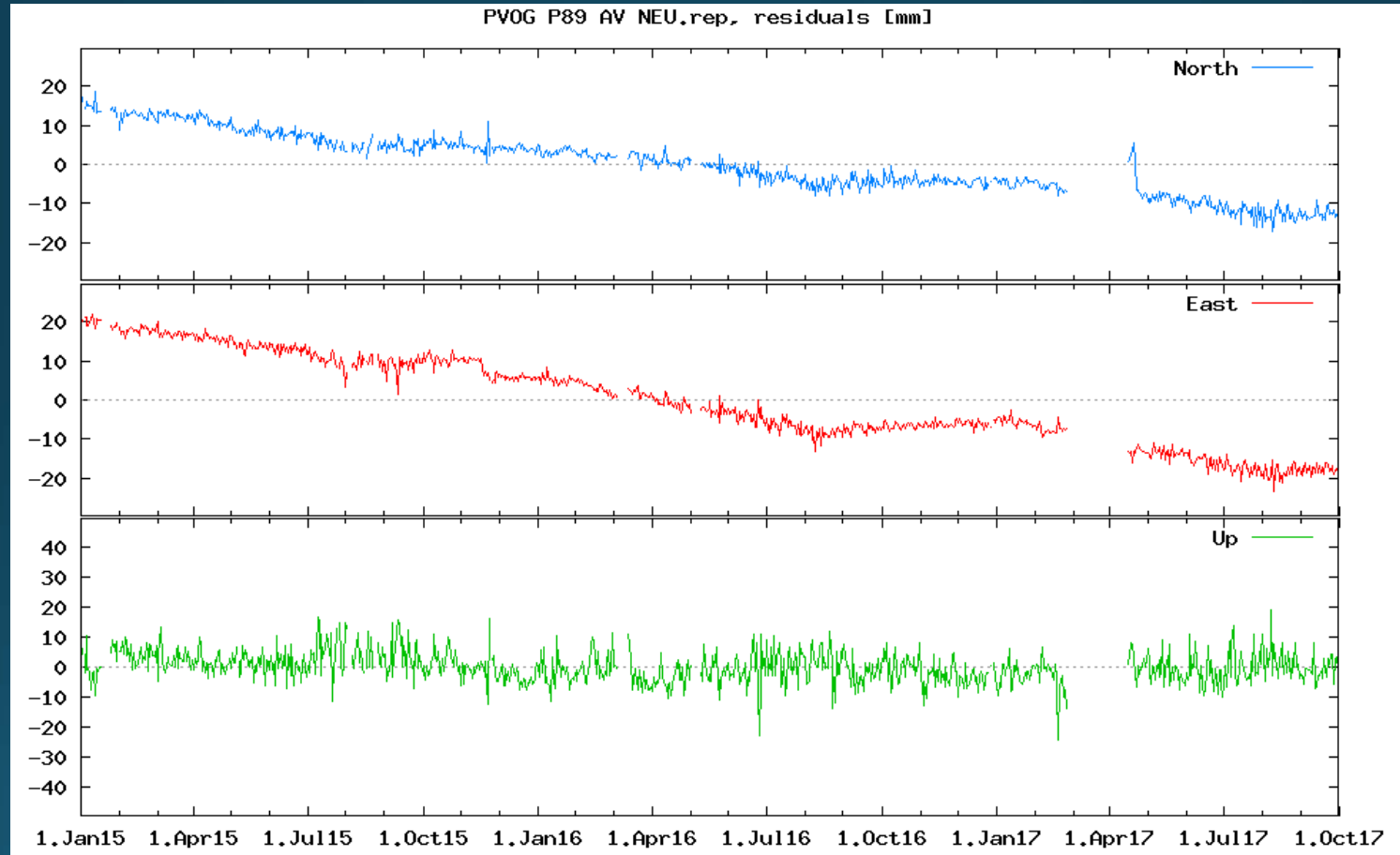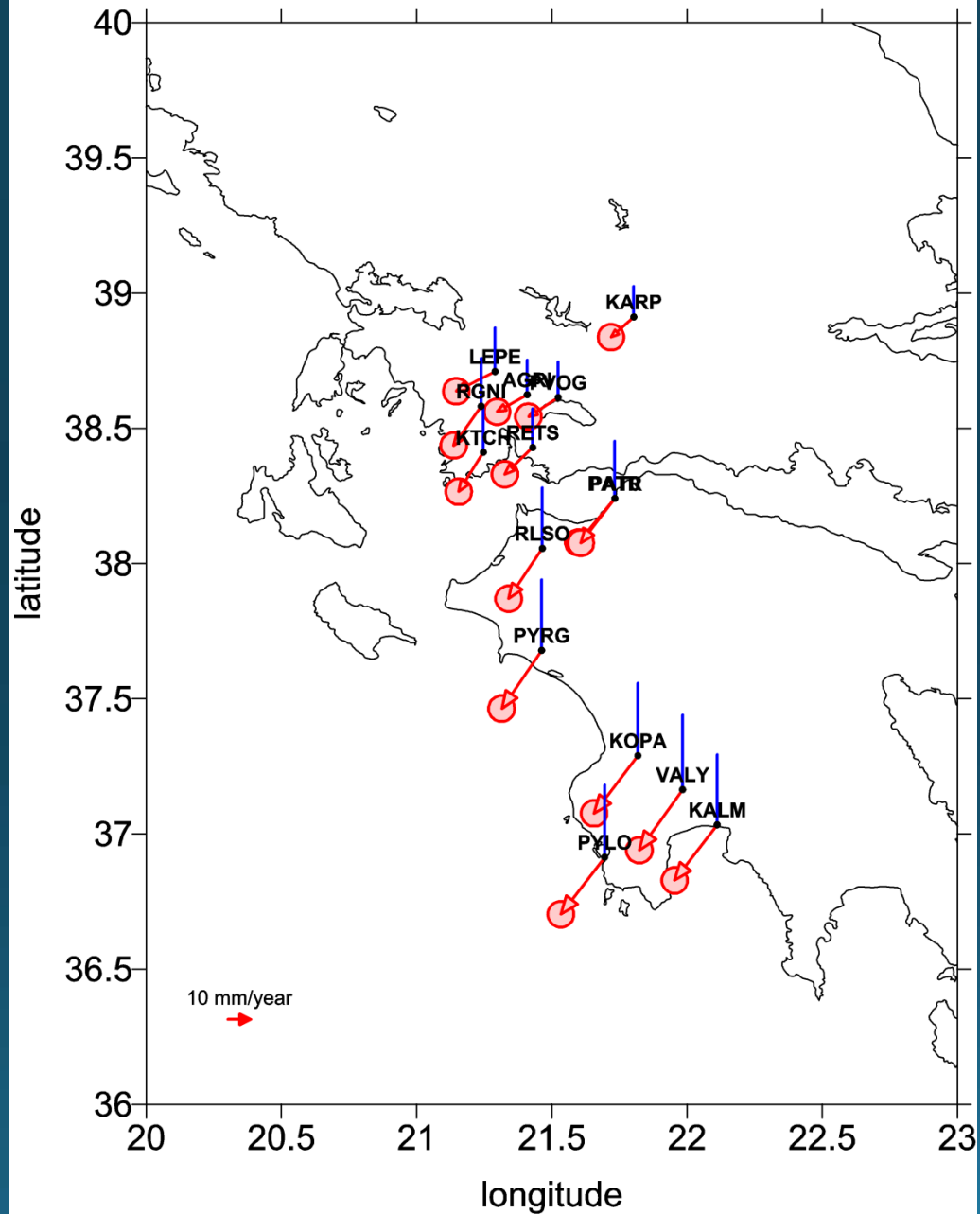# Change of antenna position at Kato Retsina

Before

After

PPGNet processing

- Bernese GPS Software 5.0 with Bernese Processing Engine
- 30 second daily files form PPGNet + 4 stations from NOA + 6 stations from METRICA
- Fiducial/reference stations: 9 stations of EUREF Permanent Network Class A
- Double differenced observations of GPS NAVSTAR with minimum baseline counts
- Ambiguity strategy: Quasi-Iono Free
- Elevation mask: 3 deg
- Antenna phase centers: absolute model, individual when available
- Orbits: IGS final
- Troposphere: model Niell, Zenith tropospheric delay parameter one per 1 hour, troposphere gradient one per day
- Coordinate time series from daily solutions were checked for jumps. Beside velocity determination the annual periods also determined when detected.
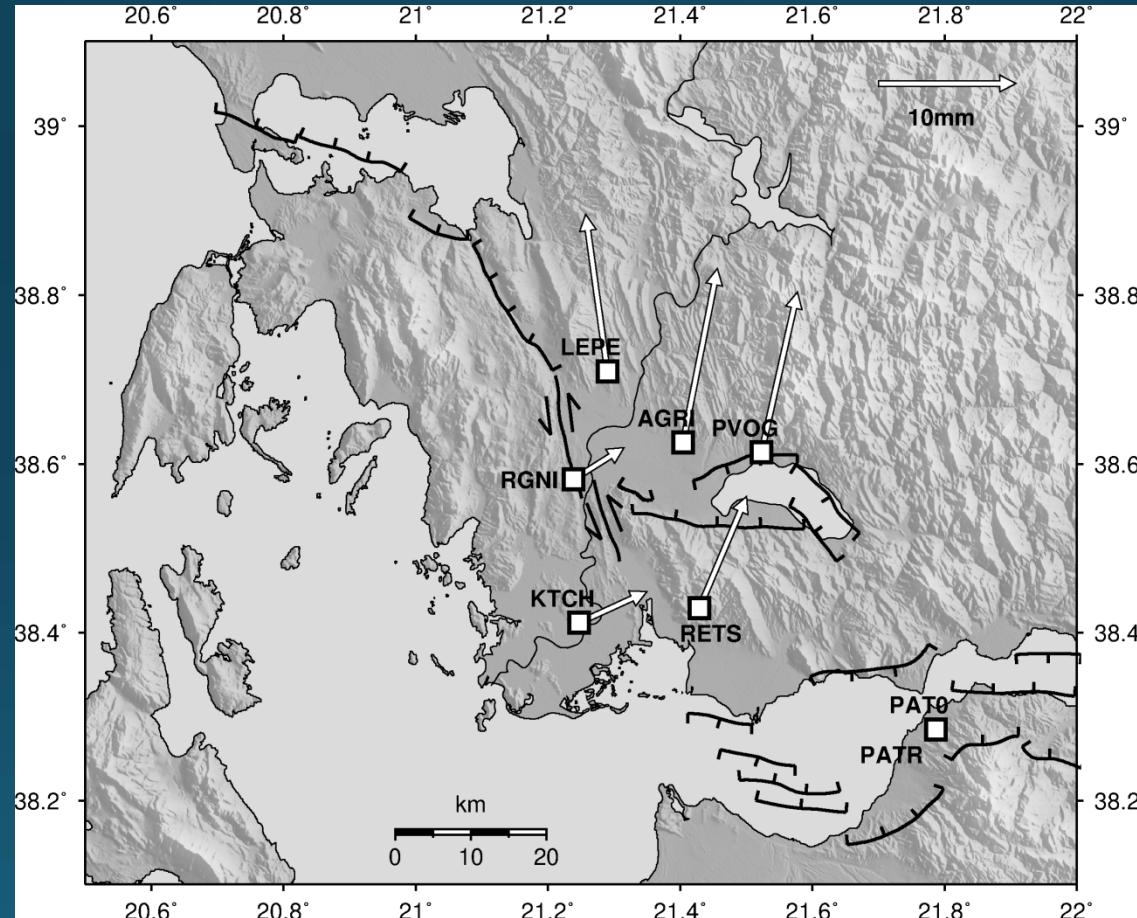
Coordinate time series

PVOG P89 AV NEU.rep, residuals [mm]

Velocity vectors with 3 sigma error elipses

Velocities in Aitolo-Akarnania area when PATR/PATo fixed

- Results prepared for publication in article: Lyros E., Kostelecky J., Plicka V., Filler V., Sokos E., Nikolakopoulos K.: The Aitolo-Akarnania (Western Greece) GNSS network PPGnet – first results.

Thank you for your attention.