TOWARDS D2050 AND THE "ROUTINE" COMBINATION IN EPN DENSIFICATION

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and the representatives of 26 ACs

OUTLINE

- MILESTONES
- METADATA HARMONIZATION
- IGb08 → IGS14 CRD CONVERSION
- AC STATUS, CONTINUATION
- VELOCITY UNCERTAINTIES
- EXPLOITATION

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MILESTONES

- D1933 PUBLISHED LAST YEAR
- **PAPER IN GPS SOLUTIONS**

  https://rdcu.be/bS6FI
- ENHANCED VELOCITY FILTERING
- METADATA CROSSCHECK
- PREPARATIONS FOR D2050

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ORIGINAL ARTICLE

Regional integration of long-term national dense GNSS network solutions

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Abstract

The EUREF Permanent Network Densification is a collaborative effort of 26 European GNSS analysis centers providing series of daily or weekly station position estimates of dense national and regional GNSS networks, in order to combine them into one homogenized set of station positions and velocities. During the combination, the station meta-data, including station names, DOMES numbers, and position offset definitions were carefully homogenized, position outliers were efficiently eliminated, and the results were cross-checked for any remaining inconsistencies. The results cover the period from March 1999 to January 2017 (GPS week 1000-1933) and include 31 networks with positions and velocities for 3192 stations, well covering Europe. The positions and velocities are expressed in ITRF2014 and ETRF2014 reference frames based on the Minimum Constraint approach using a selected set of ITRF2014 reference stations. The position alignment with the ITRF2014 is at the level of 1.5, 1.2, and 3.2 mm RMS for the East, North, Up components, respectively, while the velocity RMS values are 0.17, 0.14, and 0.38 mm/year for the East, North, and Up components, respectively. The high quality of the combined solution is also reflected by the 1.1, 1.1, and 3.5 mm weighted RMS values for the East, North, and Up components, respectively.

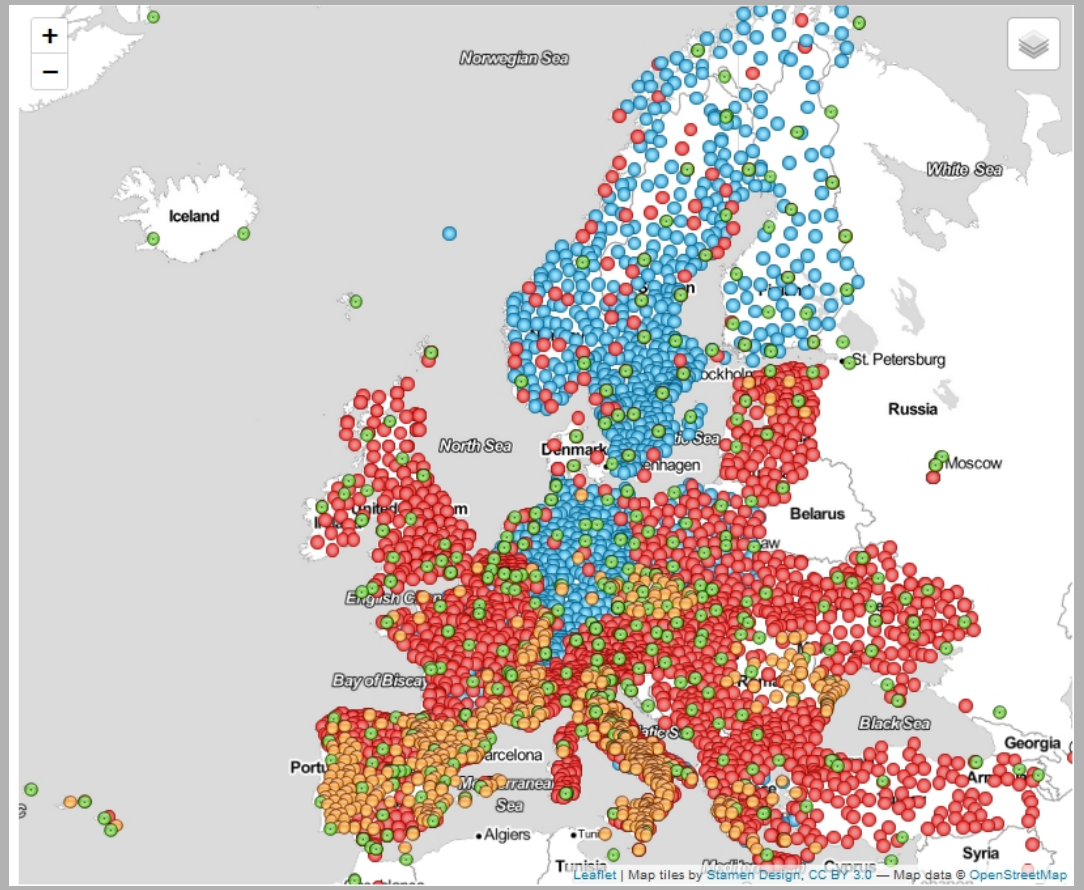
Keywords Reference frame · GNSS · SINEX · Combination · Densification · Velocity field

OUTLINE

- MILESTONES
- METADATA HARMONIZATION
  - LEVEL_0: 4-CHAR IDs
    - (9?) - waiting for software updates

METADATA HARMONIZATION

IERS – EPN D – E_GVAP



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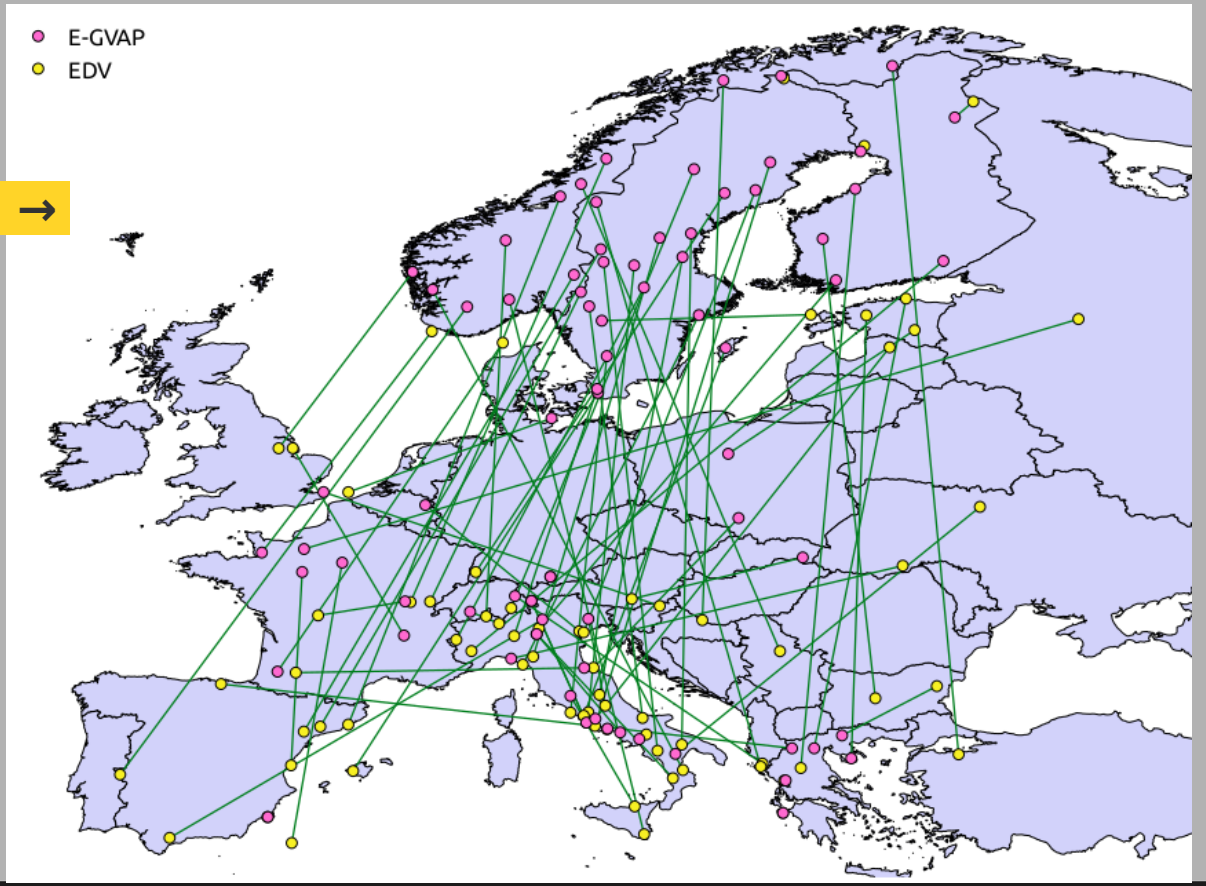
METADATA HARMONIZATION

IERS – EPN D – E_GVAP

1836 agree
324 name conflict
193 crd conflict →
1424 – no match

Publicly available, agreed conversion table is needed

In progress ...



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METADATA HARMONIZATION

- LEVEL_0: 4-CHAR IDs
- LEVEL_1: EQUIPMENT & ATX (X)CHECK

  metadata in logsheets vs SINEX(n)

  type-mean vs individual

LOG SHEETS ARE ESSENTIAL !!!

M3G

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IGb08 → IGS14 CONVERSION

- ALL IGb08 COMPLIANT SOLUTIONS BEFORE W1933
- IGS TOOL AND LATITUDE DEPENDENT MODEL TO CONVERT CERTAIN TYPE MEAN PCVs TO IGS14
- INDIVIDUAL CALIBRATIONS ARE **NOT** AFFECTED
- LIMITED NUMBER OF STATIONS INVOLVED
- UNAVOIDABLE FOR VELOCITY ESTIMATION

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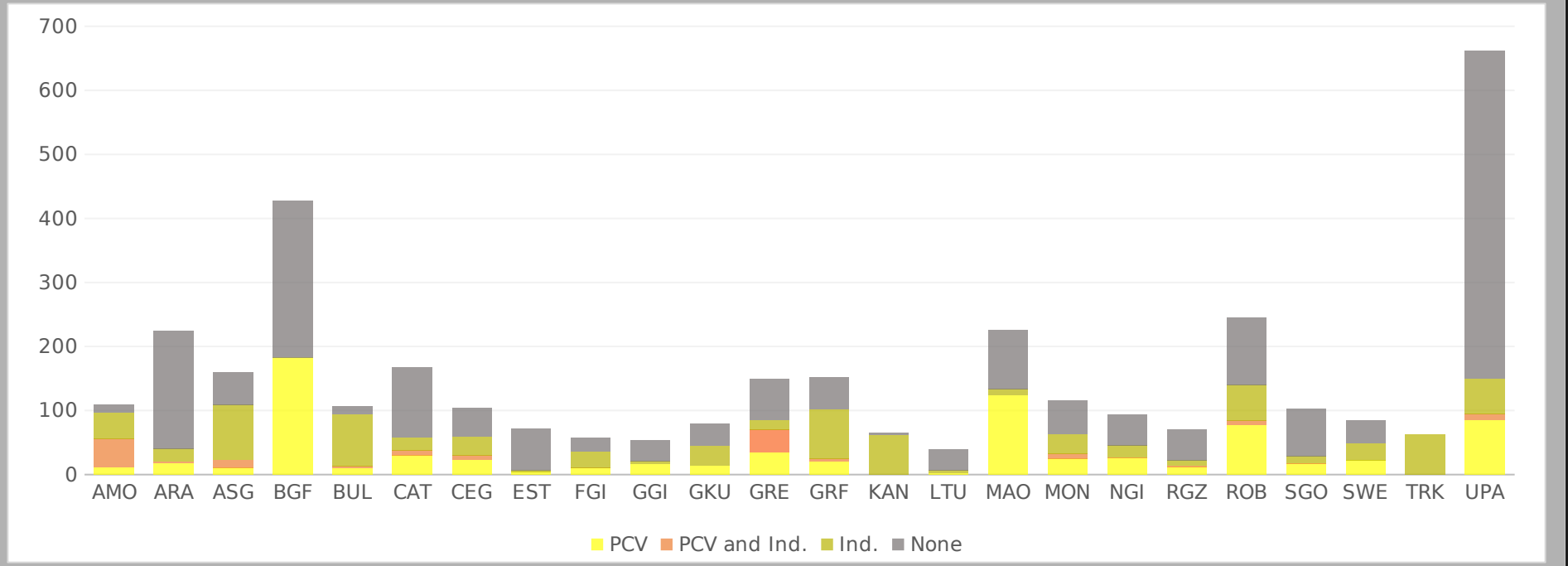
IGb08 → IGS14 CONVERSION



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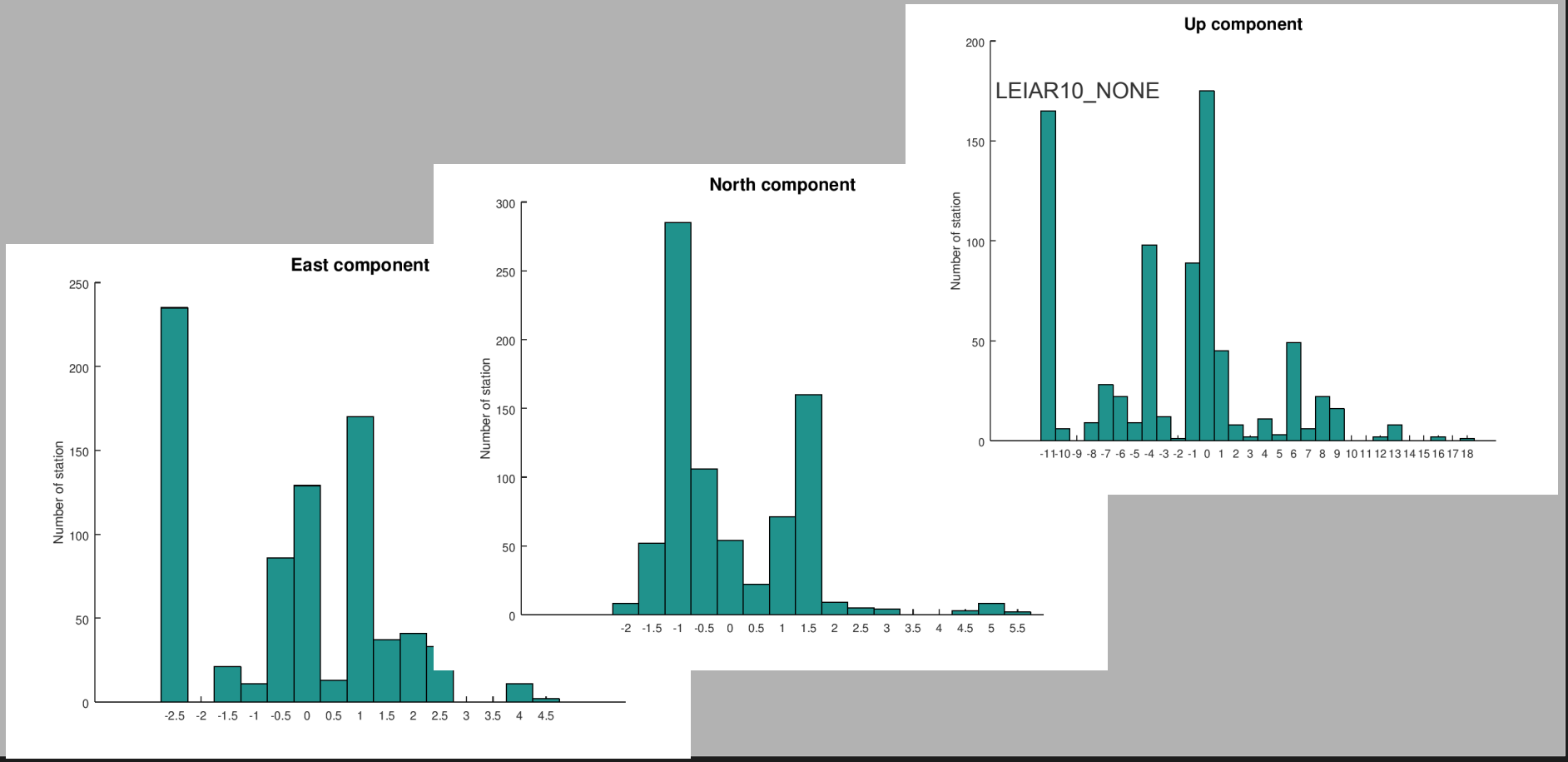
IGb08 → IGS14 CONVERSION



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AC STATUS after D1933

Not active any more	CEG – GRE – MON (G Stangl) AGRS?
Routine processing	ARA – ASG – BUL – EST – DSO – FGI – GKU – GRF – ROB – SGN – SGO – SWE – UPA
Routine in progress	CZE – DEN – ISS – NOR
Up to now in batches	GGI – LTU – NGI – IBE
(Capacity) issues	AMO – BIGF – CAT – MAO – SRB
New: EPOS &	INGV – UGA-CNRS – ROM(SGO)

AC VISIBILITY

- PAPERS LIKE THE D1933 PUBLICATION IN GPS SOLUTIONS
- DOI TO ALL AC PRODUCTS RINEX to SINEX

  EUREF level action is planned
- **DATA PUBLICITY:** CLARIFICATION IS NEEDED FROM ALL ACs, ON WHAT SHOULD BE MADE AVAILABLE

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D1933 → D2050

- IGb08.atx → IG14.atx
- Two more years of data
- Improved meta data check

(X)CROSS-CHECK

- Realistic uncertainty estimate: hector by M Bos
- Draft version: December 2019 AGU presentation
- New web pages for displaying the results

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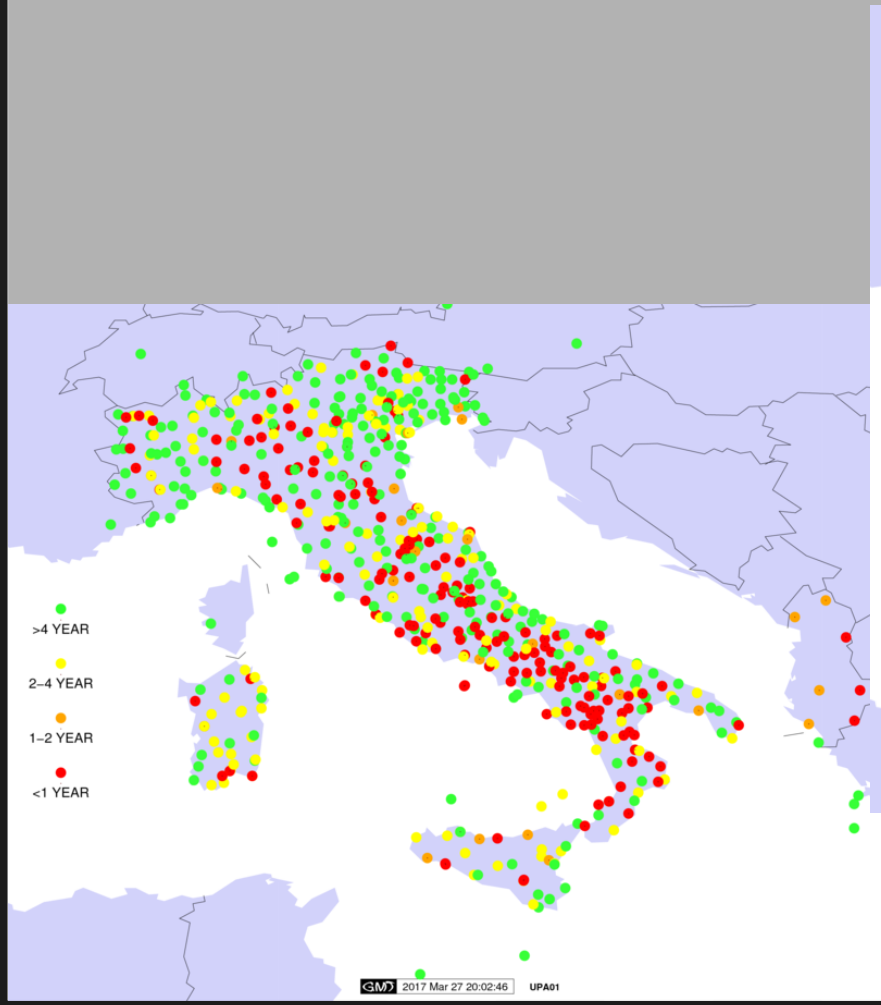
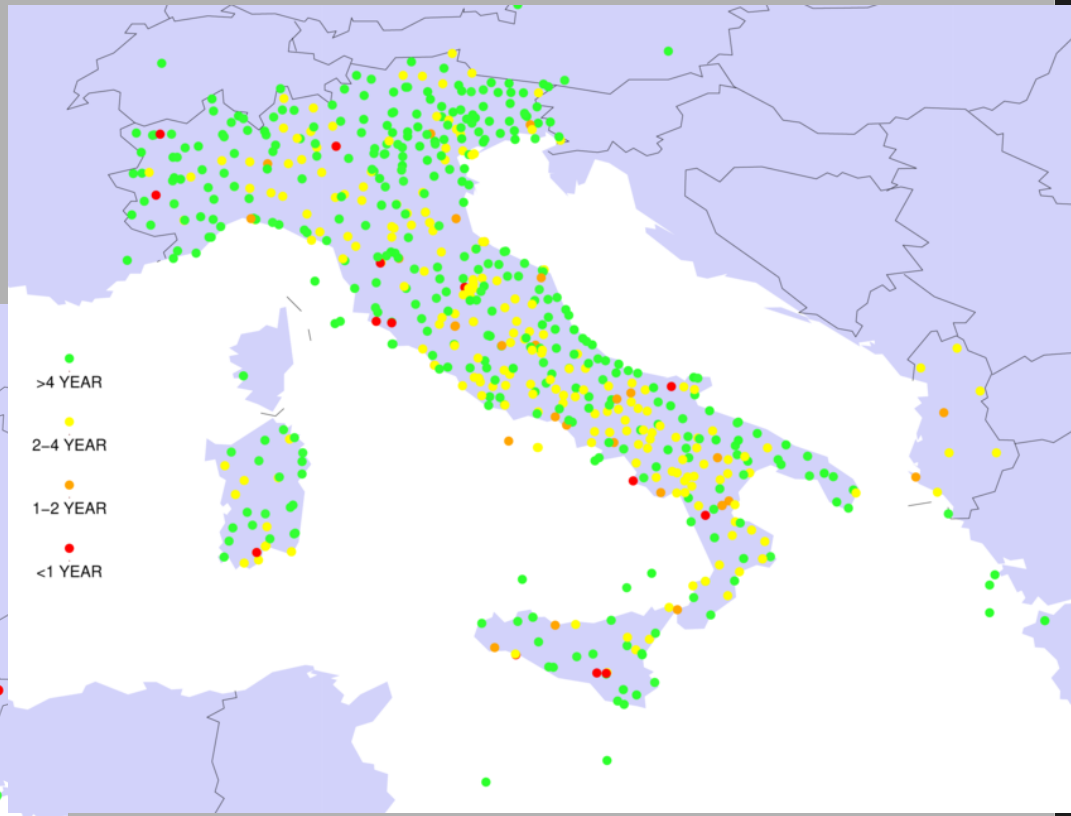
D1933 → D2050: EXAMPLE





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EXPLOITATION

- POSITION AND VELOCITY VALIDATION OF NATIONAL DENSIFICATIONS – **ESTONIAN EXAMPLE !!**
- **WG OF GEOKINEMATICAL MODELLING**
  realistic uncertainties are needed
- **EPOS ERIC**
  EPN Densification + EPOS pan-European processing
- **EUROPEAN GROUND MOTION SERVICE**
  project starts in 2020 and EPN Densification may used to connect InSAR patches and validation of the results.
  Velocities + timeseries are required.

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FUTURE STEPS

- THE ENHANCED D2050 SOLUTION BEING PUBLISHED IN DECEMBER 2019
- DEDICATED WEB PAGES PREPARED IN PARALLEL
  - P & V SOLUTIONS SHALL BE AVAILABLE
  - INTERACTIVE PAGES FOR BROWSING TIME SERIES
  - SUPPORT FOR TECTONIC INTERPRETATION
  - VELOCITY FILTERING AND MODELING
- D2075 PUBLISHED IN SPRING 2020, THEN REGULAR UPDATES 3 TIMES PER YEAR (ROUTINE ANALYSIS IN THE BACKGROUND
- PLAN TO DECLARE IT AS A EUREF PRODUCT

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