

EPN DENSIFICATION WG : WHERE TO GO ?

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CHAIR OF EPN DENSIFICATION WORKING GROUP

A BARON - C BRUYNINX - A CAPORALI - F DE DONCKER - B DROSCAK - A DURET -
P FRANKE - I GEORGIEV - D HANSEN - L HUISMAN - L JIVALL - O KHODA -
- K MOROZOVA - J NAGL - X PAPANIKOLAOU - E PARSEULINAS - P PIHLAK -
G STANGL - M VALDES - M RYCZYWOLSKI
AI KURT - S LAHTINEN - OB TANGEN - M WEBER

EPNCB (J LEGRAND, D MESMAKER)

B MAGYAR

AND MANY MORE . . .



EUREF 2018 Symposium
Amsterdam 30 May - 1 June, 2018

A REMINDER:

EPN DENSIFICATION IS COMBINATION OF NATIONAL WEEKLY SINEX SOLUTIONS TO REALIZE HOMOGENEOUS, DENSE EUROPEAN LEVEL **POSITION AND VELOCITY** PRODUCT

MAIN FEATURES

- DISTRIBUTED PROCESSING, BUT CENTRALIZED ANALYSIS
→ SAME ANALYST, **COHERENT** HANDLING OF SINEX INPUT
- **TIME SERIES LEVEL COMBINATION (SEE ITRF)**
- **MULTI-LEVEL QUALITY CHECK AND HOMOGENIZATION**
- **RIGOROUS COMBINATION WITHOUT ANY COMPROMISE, SIMPLIFICATION!**
- **COMBINED SOLUTION FREED FROM OCCASIONAL REFERENCE FRAME DEFINITION WEAKNESSES,**

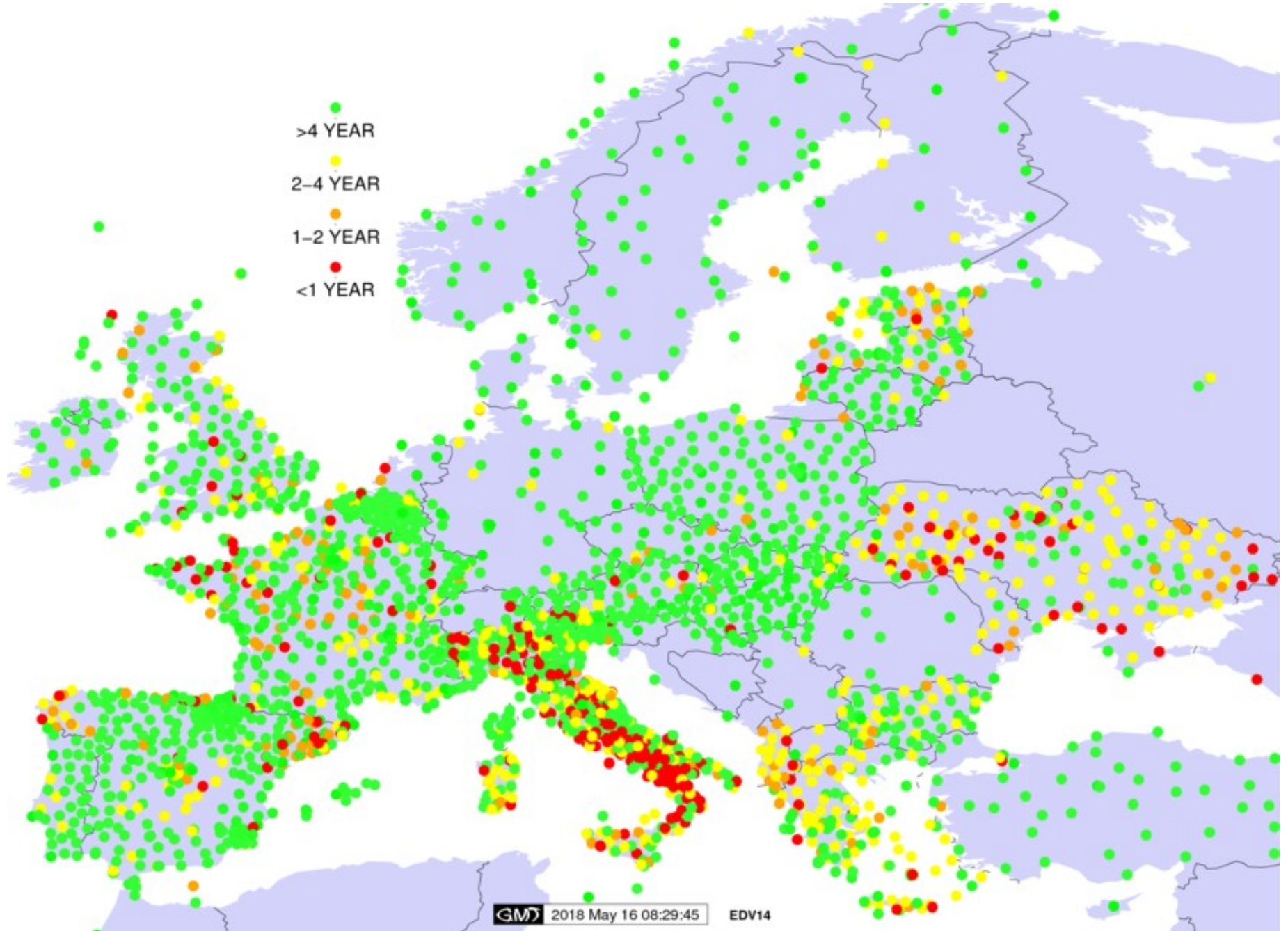
D1933 IS READY!



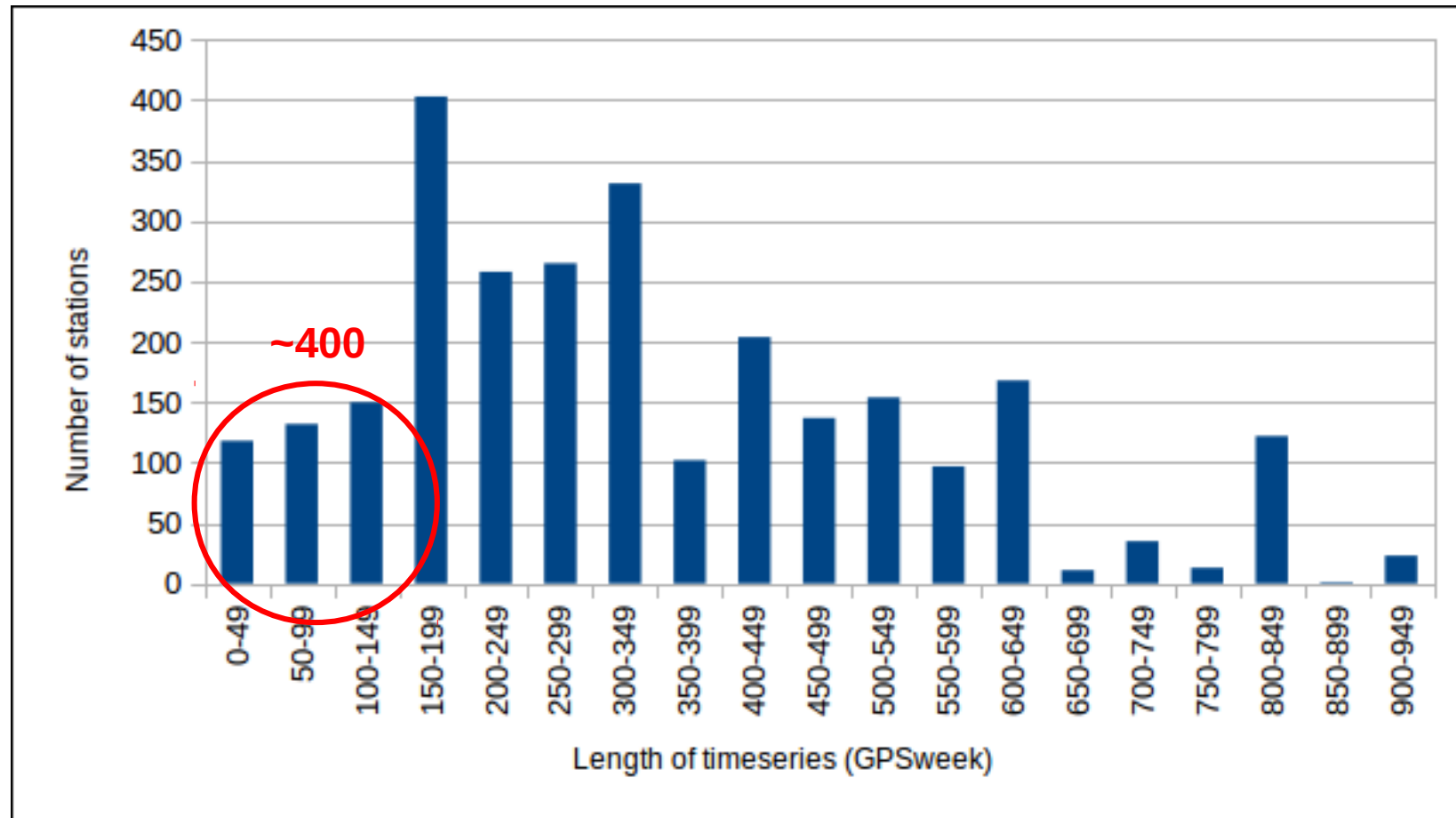
ABOUT D1933 ...

- CONTINENTAL COVERAGE - **MISSING 4 BALKAN COUNTRIES (NO PROCESSING YET) & SWITZERLAND**
- CLEANED METADATA - CRITICAL PART (**E_GVAP CONTACT**)
- TOTAL 3192 STATIONS (3053 IN EUROPE)
 - 1322 SITE LOGS
 - **80% DOMES NUMBER** ATTRIBUTED
- 12726 WEEKLY SINEX FILES (up to week 1933!)
- 28 GB OF SINEX DATA - ALL IN **IGb08 & KEEPING EUREF STANDARDS**
- DATA AVAILABILITY MOSTLY SINCE 2007 (**AFTER WEEK 1400**)
- RUNTIME: 32 HOURS IN A MULTI-CORE COMPILER ENVIRONMENT
- **10.7 GB cumulative SINEX** - [29214] COV matrix

SINEX AVAILABILITY (up to week 1933)



SINEX AVAILABILITY (up to week 1933)

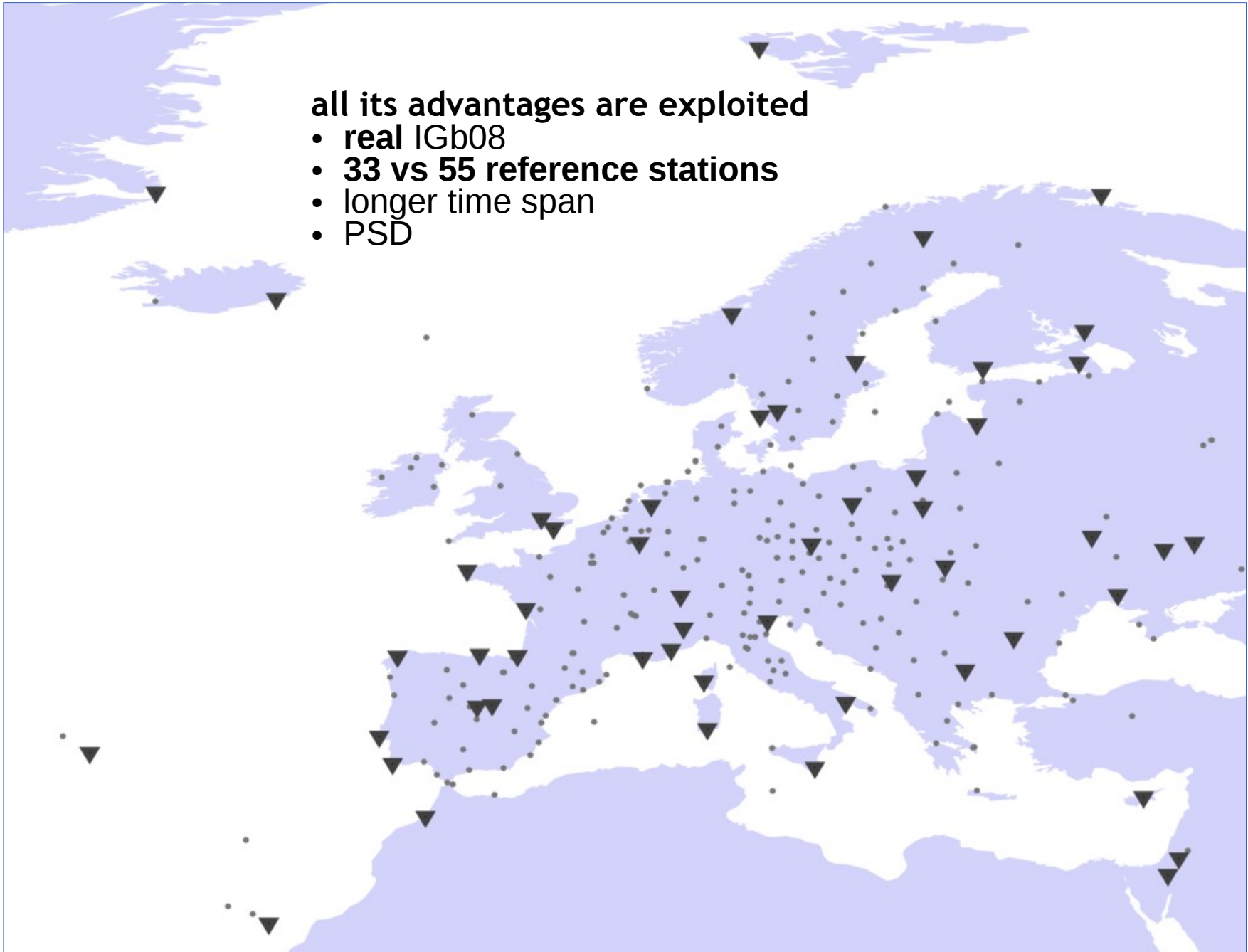


REFERENCE FRAME: ITRF2014

MC realization tested and passed

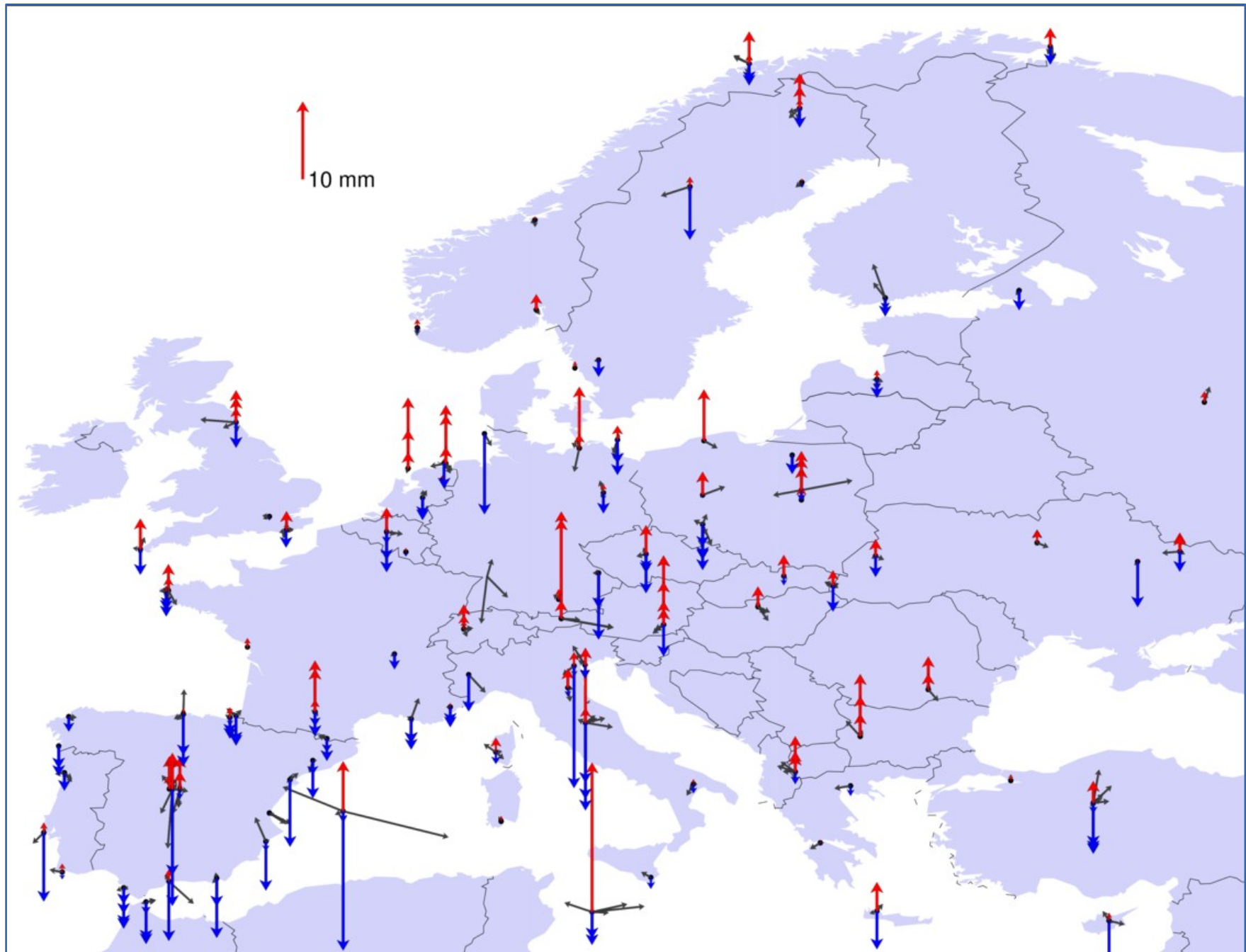
all its advantages are exploited

- real IGB08
- **33 vs 55 reference stations**
- longer time span
- PSD

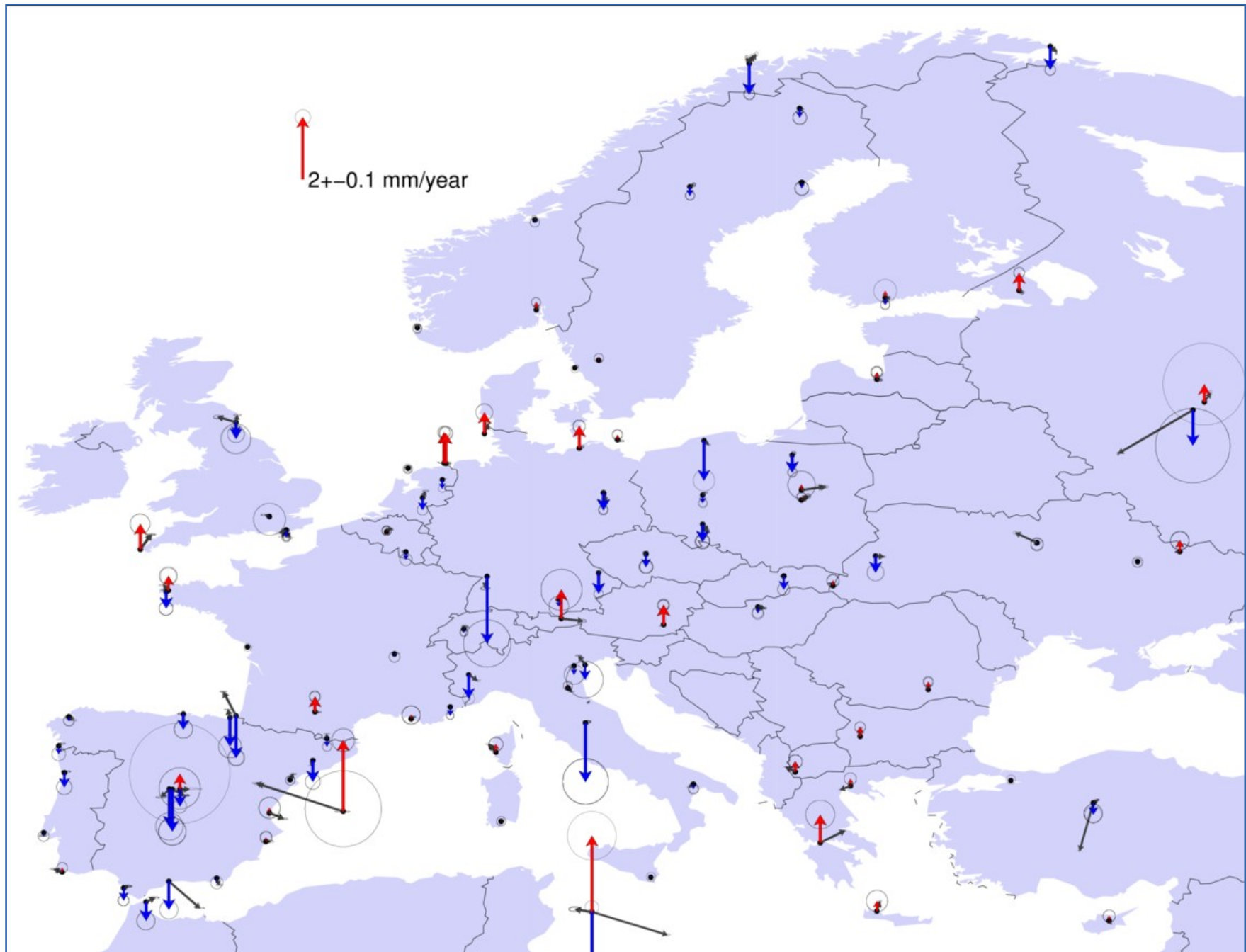


ITRF2014 vs D1933 - positions (epoch 2010.0)

SVTL_2, ZWEN, KARL, MARS_5, REYK_1, TOUL_2, LAMP4-5

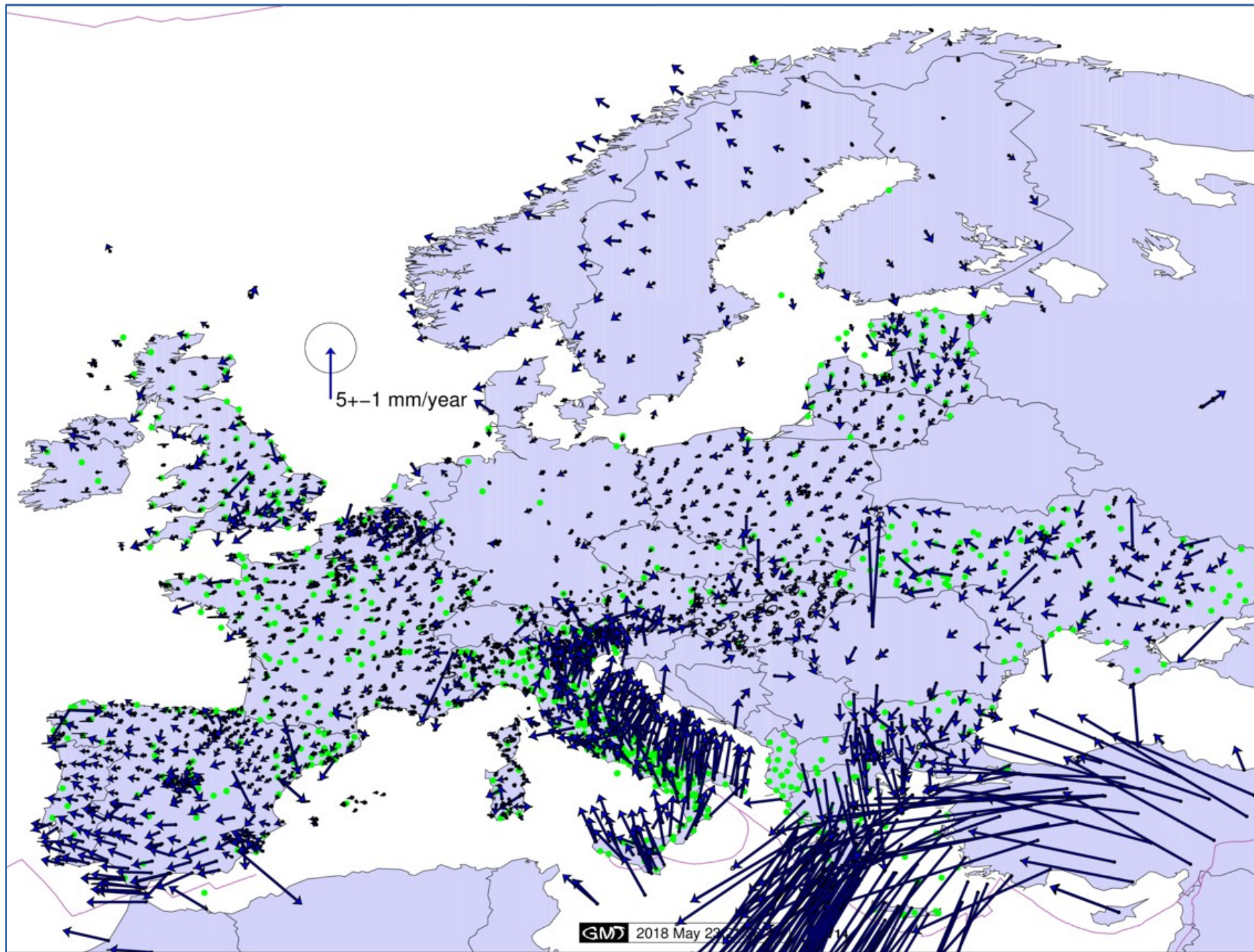


ITRF2014 vs D1933 - velocities



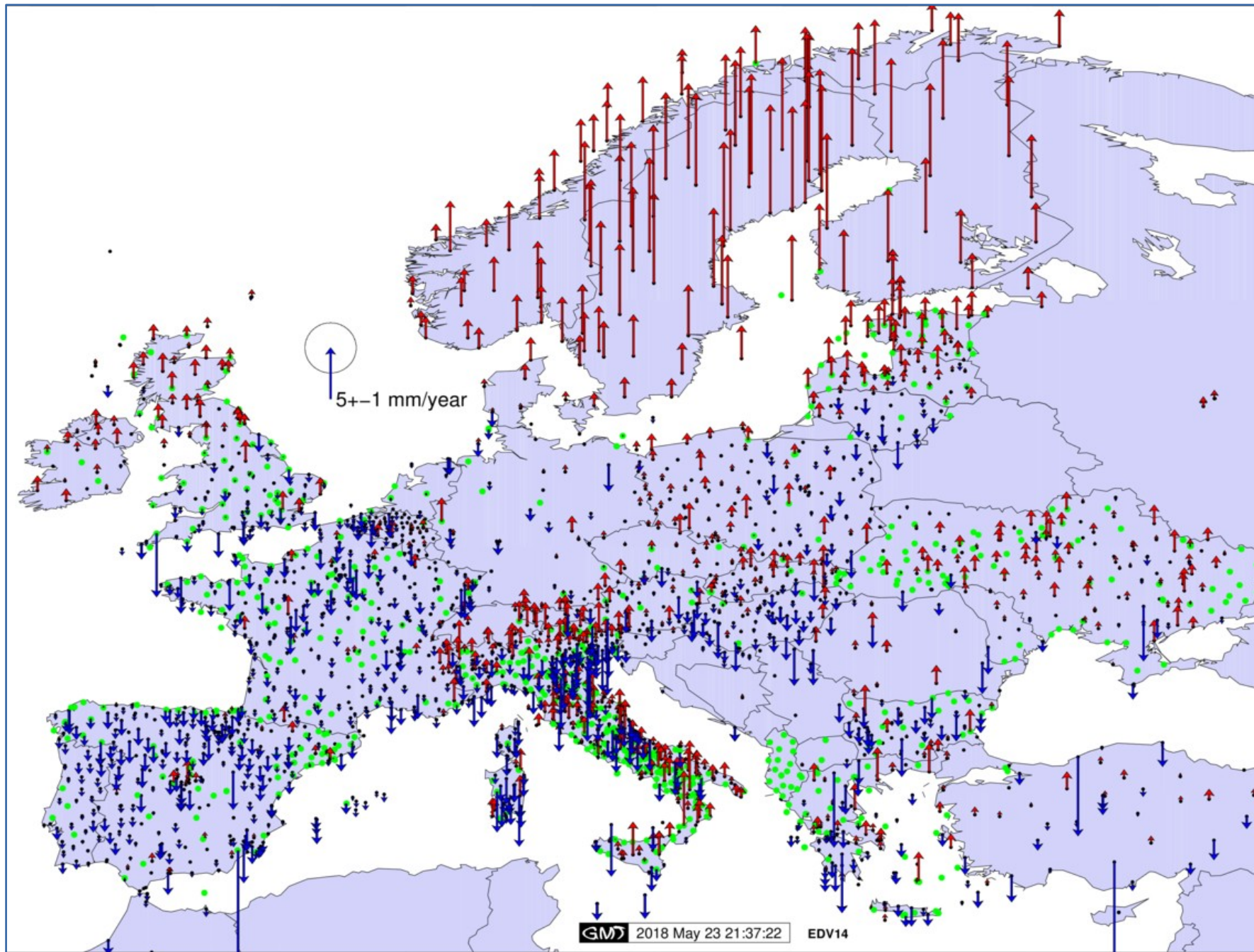
ETRF2000 VELOCITIES

L > 3 years



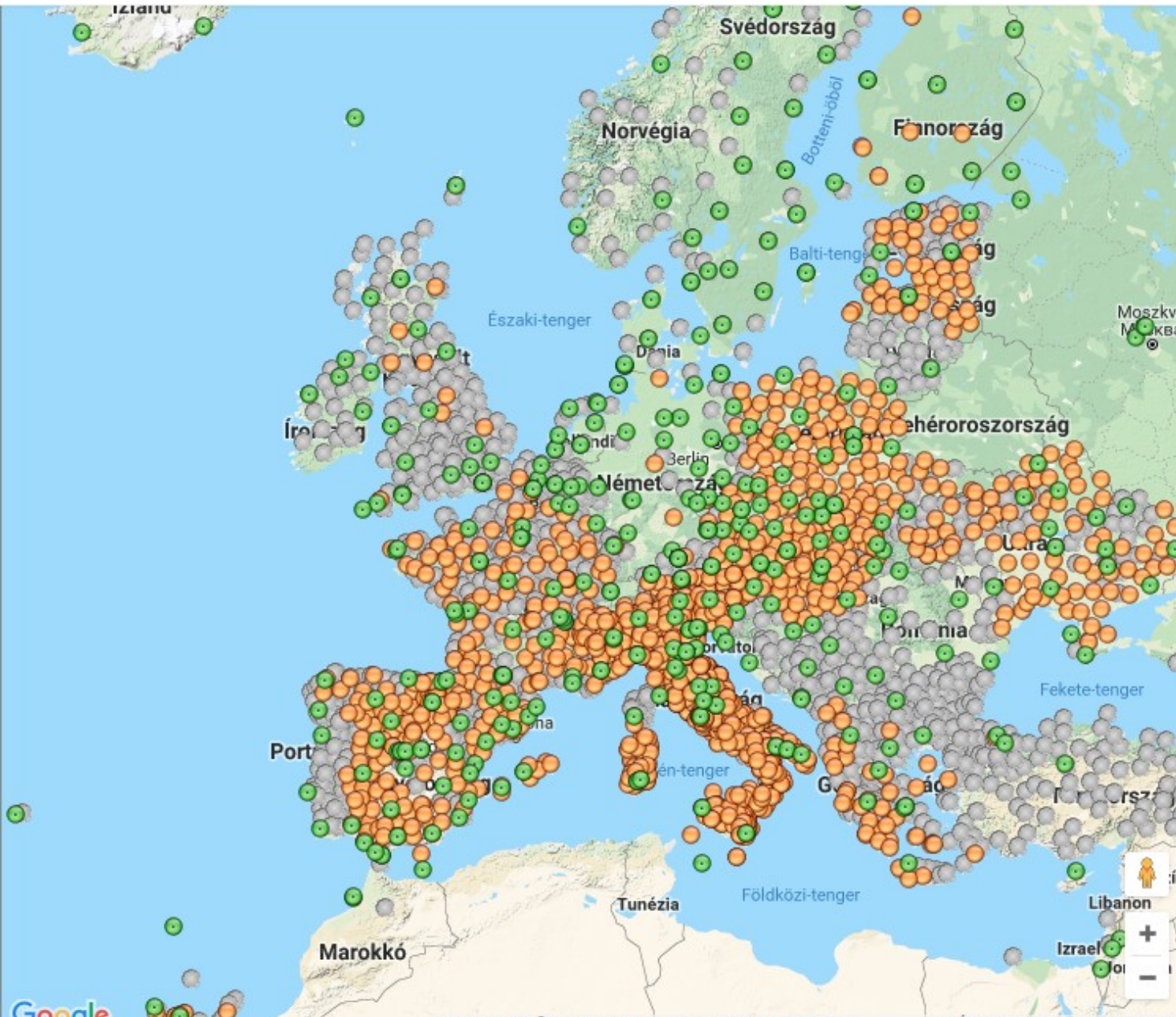
UP VELOCITIES

L > 3 years



EPN DENSIFICATION WEBSITE

www.epncb.oma.be/_densification



- *****.AC** and *****.OC** forms are prepared and available
- partners are working on site logs

**ABSOLUTELY CRITICAL
TO HAVE SITE LOGS!**

site log submission like at EPN (M3G)

- **results are available
(time series, plots)**

**NUMERICAL RESULTS
AFTER THE GB APPROVAL**

WHERE TO GO ?

CONTINUATION

- **D2000** (IGb08 - IGS14 “BOUNDARY VALUE PROBLEM”)
- DEEPER META DATA CHECK (MISSING SITE LOGS)

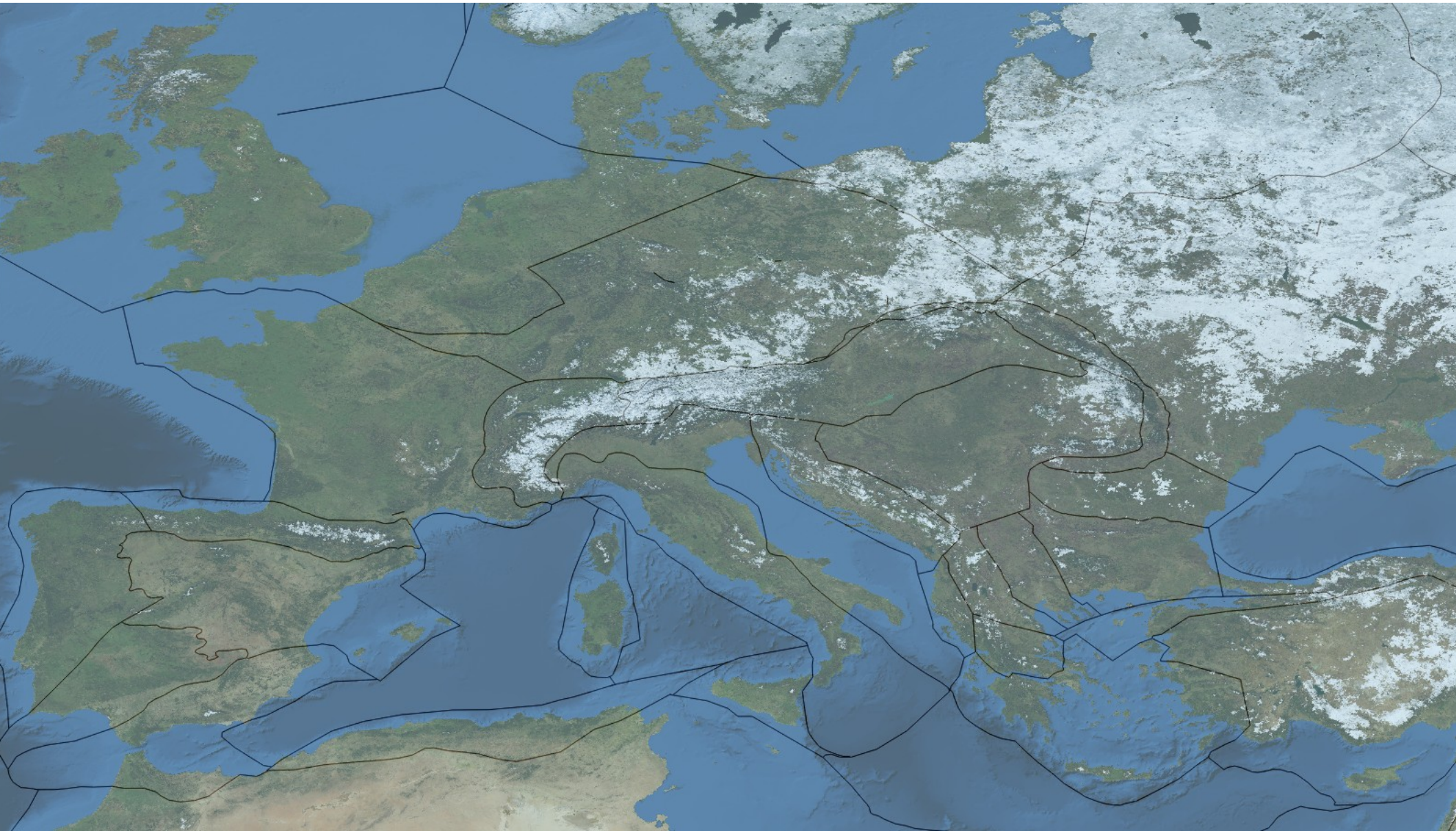
POSITION PRODUCT

ALL PARTNERS ARE ADVISED TO CHECK THEIR NATIONAL ETRS89 REALIZATION

VELOCITY PRODUCT

- RAW VELOCITY FILTERING, ELIMINATION OF BLUNDERS, GRIDDING
- EXPLOITATION WITHIN EUREF
 - DEFORMATION WORKING GROUP FOR STRAIN RATE
 - EXTENSION OF ETRS89 OVER STABLE EUROPE?
- EXPLOITATION BY OTHER COMMUNITIES
 - EPOS: EXPLOIT AND CONTRIBUTE
 - EU-GMS: MOSAICING AND VALIDATION

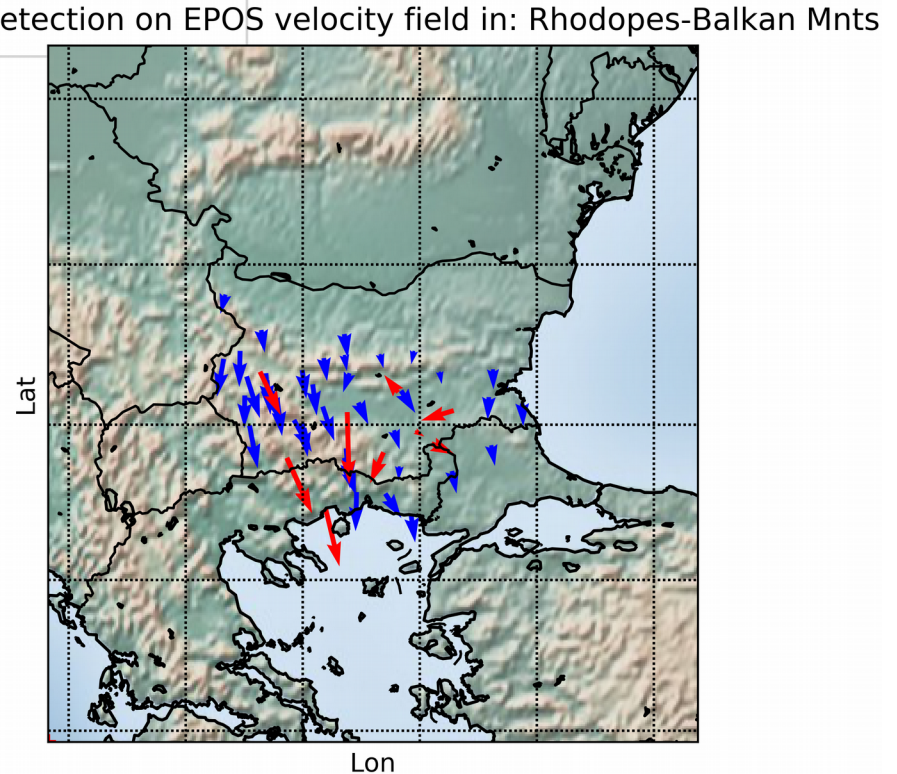
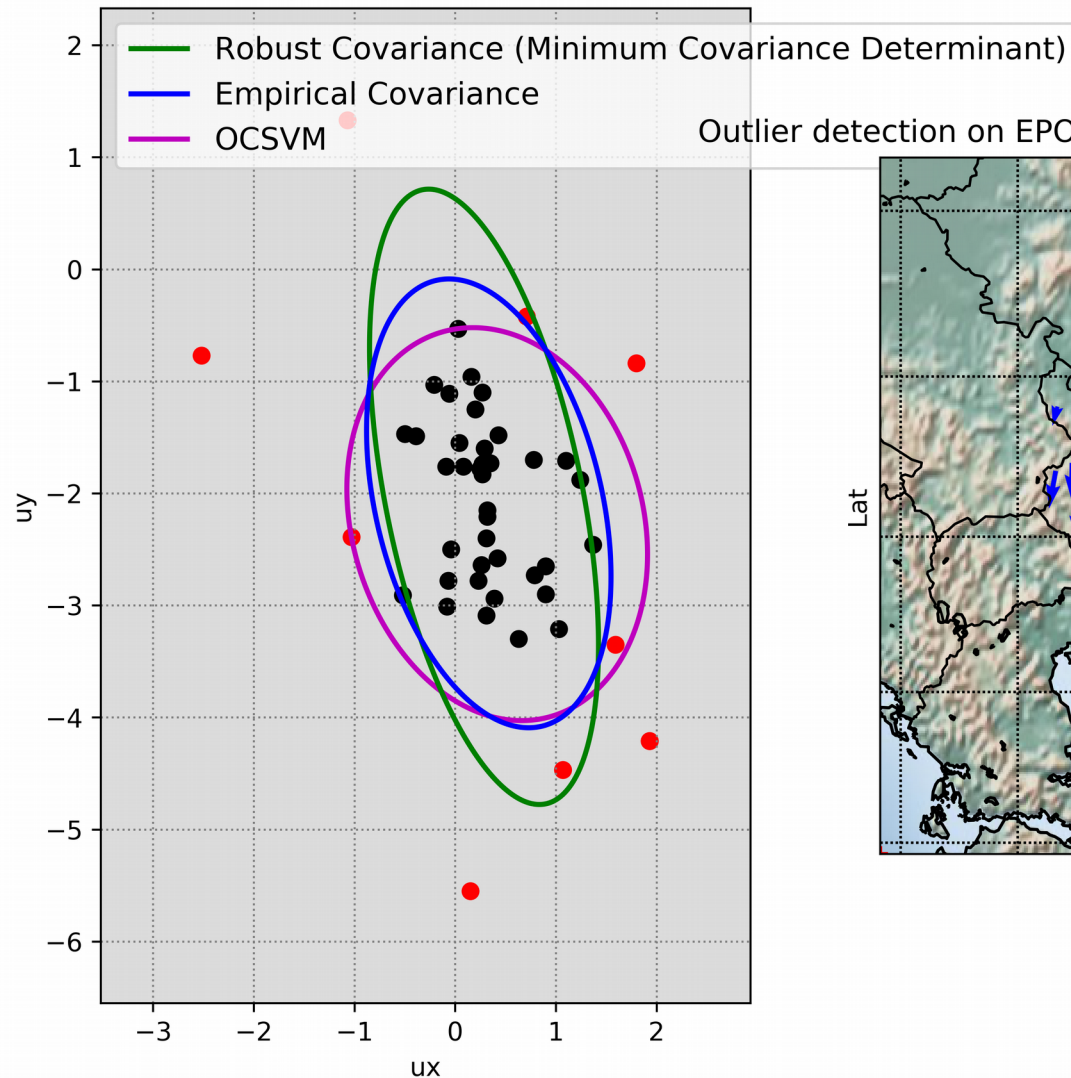
DRAFT TECTONIC UNITS FOR VELOCITY FILTERING



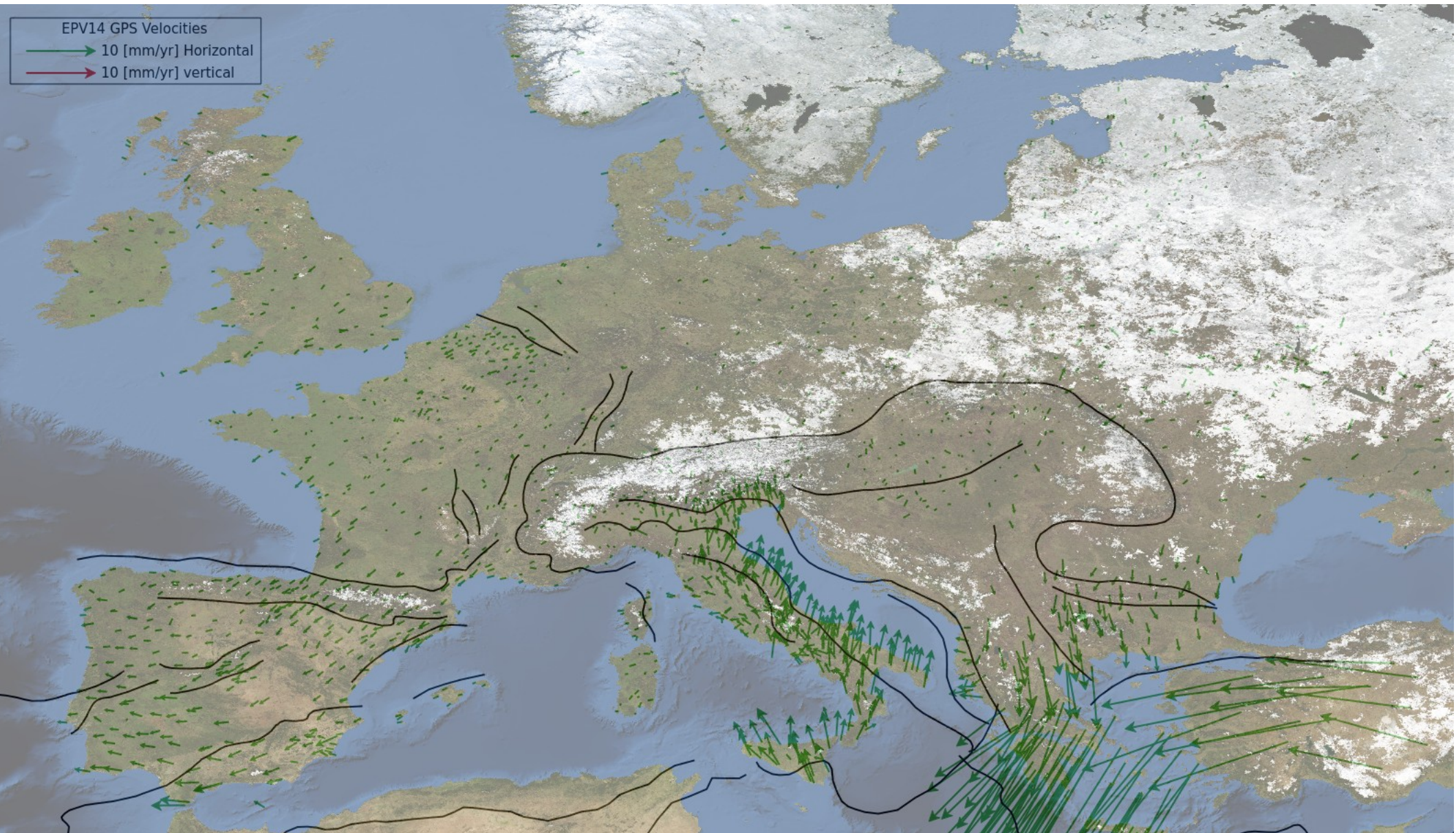
VELOCITY HOMOGENIZATION

- SUBSETS IDENTIFIED AND SELECTED SITTING ON THE SAME TECTONIC UNIT
- FILTERING BASED DIFFERENT STATISTICAL ALGORITHMS

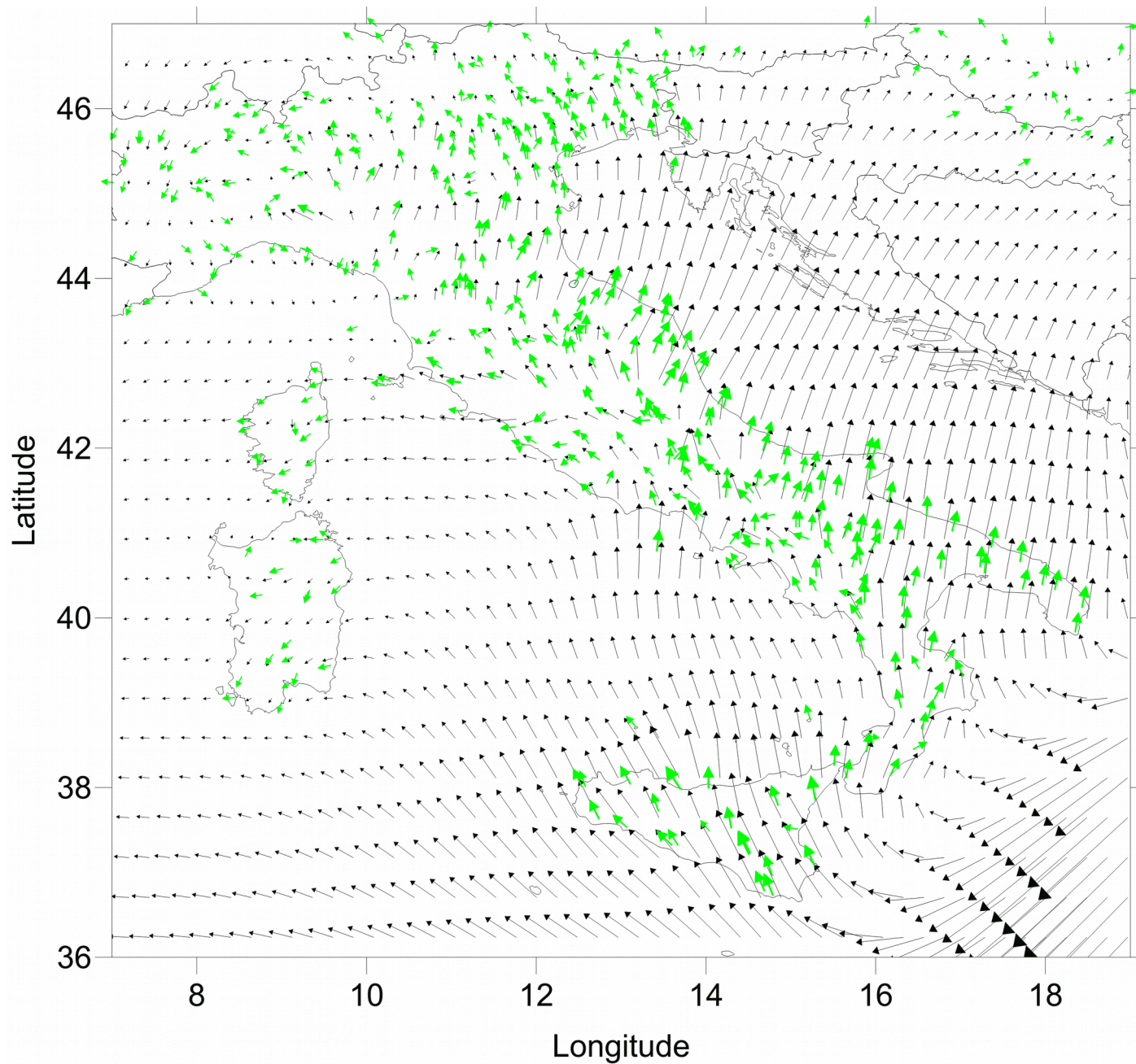
Subspace of velocity components with error fraction: 0.2



TECTONIC UNDERSTANDING



VELOCITY MODELING - 1ST TEST



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VELOCITY PRODUCT

- FILTERING, ELIMINATION OF BLUNDERS, GRIDDING
- EXPLOITATION WITHIN EUREF
 - DEFORMATION WORKING GROUP: INPUT FOR STRAIN RATE
 - EXTENSION OF ETRS89 OVER STABLE EUROPE?
- EXPLOITATION BY OTHER COMMUNITIES
 - EPOS: EXPLOIT AND CONTRIBUTE (PAN-EUROPEAN PROCESSING)
 - EU-GMS: RADAR MOSAICING AND VALIDATION

THANKS FOR THE SUPPORT OF ALL ACs!

LET'S HAVE A SHORT REST AND BE PREPARED FOR D2000

