INTRODUCTION

The European contribution to the IAG Working Group on "Dense Velocity Fields" relies on the integration of the dense national permanent GNSS networks. In Europe the situation is more complex than in other regions because numerous countries operate independent networks. Fortunately the EUREF Permanent Network (EPN) and its products can be used as backbone infrastructure and the separate national GNSS data processing practically rely on the strategy defined for the EPN analysis.

In order to avoid any inconsistencies the combination is done on the weekly SINEX level. The national weekly SINEX submissions are combined with the actual weekly EPN SINEX solution, than a multi-year cumulative solution is created, which already includes all input. Before the creation of the integrated cumulative solution several quality and homogeneity tests (strategies, models, naming, data availability, site stability, weighting) are being performed. The integration is done with the CATREF software using the Minimum Constraint approach.

STRATEGY

COLLECTION AND PREPARATION OF NATIONAL LONG TERM WEEKLY SINEX SOLUTIONS
- input SINEX, compatible with the EPN analysis strategy
- SINEX testing and cleaning (constraints/outliers/offsets)
- solution harmonization with EPN/IGb08

COMBINATION WITH EPN WEEKLY SINEX
- EPN used as reference
- CATREF / Minimum Constraint approach
- same reference network as for the EPN cumulative
- clustering due to the large dataset

RESULTS / PRODUCTS
- cleaned national weekly and cumulative SINEX solutions, position and velocity estimates in ITRFyy/IGSyy/ETRFyy, time series plots,
- velocity field as main input to deformation modeling and stable ETR589 realization in tectonically active regions

STATUS, OUTLOOK

- EPN DENSIFICATION WILL BE GLOBAL (BIGF, SGN)
- MIXED ATX SOLUTIONS ARE USED (igs05, igs08, igb08)
- antenna-dependent offsets - individual calibrations are not affected!
- IGS corrections were not applied (see below)
- METADATA DATABASE MAINTENANCE
- EPN, EPN Associated Sites
- FIRST PUBLICATION IN 2015
- PLANNED REPROCESSING: IGS -> EPN densification
- ROUTINE WEEKLY SINEX SUBMISSION, UPDATED COMBINATION TWICE PER YEAR

DATA AVAILABILITY (GPSweeks 1400-1790)

- provider country submission speciality
  (1) SGO Hungary global
  (2) UPA Italy (Padova) only RAW data
  (3) AGNES Switzerland cumulative only (ig01)
  (4) GIKU Slovakia
  (5) GREF Germany
  (6) SGN France
  (7) HEPDS Greece
  (8) BUL Bulgaria daily GAMIT solutions
  (9) BIGF UK
  (10) AGRS The Netherlands
  (11) GGI Latvia
  (12) CZEPZ Czech R
  (13) MAAMET Estonia
  (14) ASG Poland biannual campaigns
  (15) CEGN C-Europe regional (SE-Europe)
  (16) GREECE Greece daily, incl. Portugal

COMPARISON OF MODELED AND ESTIMATED OFFSETS DUE TO THE IGS05 / IGS08 ATX CHANGE AT GPSWEEK 1632

ESTIMATED VELOCITIES STEMMING FROM THE CUMULATIVE COMBINED SOLUTION

HORIZONTAL COMPONENT
A./ ALL ESTIMATES INCLUDED
B./ SITES WITH >3 YEARS OBSERVATION SERIES
C./ SITES WITH >3 YEARS OBSERVATION SERIES
OUTLIERS ON PLOT C./ MAY REFLECT SINGLE STATION QUALITY ISSUE.

UP COMPONENT
ONLY SITES WITH >3 YEARS OBSERVATION SERIES ARE PLOTTED W/O UNCERTAINTIES
REMARKABLE FEATURES:
- UPLIFT IN UK AND BALTIIC
- RISING ALPINE REGION
- SUB-TECTONIC REGIONS: BOHEMIA, PORTUGAL

THE “STABLE PART OF EUROPE” WHITE DOTS: VELOCITIES <1 mm/y
ZOOM TO THE MEDITERRANEAN