EUREF ACTIVITIES AND INITIATIVES TO IMPROVE THE EUROPEAN SPATIAL REFERENCE SYSTEMS

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EUREF
the KEY for the European geodetic infrastructure

• EUREF & EuroGeoGraphics / INSPIRE
NMCAs and IAG Commission 1 on Reference Frames

• Definition, realization and maintenance of the European Reference Systems/Frames
  • ETRS89 / ETRFyy  → EUREF Permanent Network
  • EVRS / EVRF2007  → UELN

• Products on the “best effort basis”, free of charge

• Technical Working Group
  • Dedicated working groups, projects
  • symposium resolutions
ETRS89 FACTS

- **ALIGNED TO THE ACTUAL ITRS REALIZATION AT EPOCH 1989 (ITRFyy → ETRFyy)**

- **OFFICIAL EUROPEAN SPATIAL REFERENCE SYSTEM SINCE 2003**

- **IMPLEMENTATION ACCORDING TO THE INSPIRE DIRECTIVE IS OBLIGATORY**

- **MODIFIED ETRS89 DEFINITION IN 2009: ETRF2000 AS CONVENTIONAL REFERENCE FRAME SOLUTION → NEW GUIDELINES**

[http://etrs89.ensg.ign.fr/memo-V7.pdf](http://etrs89.ensg.ign.fr/memo-V7.pdf)
ETRS89 / EPN

- Free rinex and real-time data service
- Maintains ETRS89
- Site coordinate and velocity updates in each 15 weeks
- Site categorization: selection of reliable EPN stations
- Guidelines


EVRS2007 / UELN

- 13 datum points
- Zero tidal system (consistent handling the permanent tidal part)
- Geopotential is known at the nodal points
- Confidential data
- Official vertical datum within EU for international cooperation, but
- Not obligatory to replace the existing national height system (transformation should be provided)
EUREF INITIATIVES

- COORDINATE MONITORING
  - ETRS89 national realization at EPN sites
  - Should be done on national level for the permanent sites (routine daily scientific GNSS data analysis)
- EUVN_DA: European GPS/levelling network
  - Target: European Height Reference Surface
- DENSE VELOCITY FIELD (towards 4D geodesy)
  - EUREF2010 resolution: create and provide weekly SINEX solutions (In agreement with the EUPOS Combination Centre initiative)
  - Operate high quality GNSS analysis facility
- ECGN, EUREF-IP . . .

MONITORING OF NATIONAL ETRS89 REALIZATIONS AT EPN SITES

- No information (EPN sites)
- Ok: (CRD delivered / EPN sites)
- No EPN sites used / nat. ETRF coordinates not published: (CRD delivered / EPN sites)
- No publication on web but coordinates delivered: (CRD delivered / EPN sites)
- Out of geographical scope of ETRS (EPN sites)

Official ETRF coordinates:
26 countries
157 sites

EPN: 39 countries
244 active sites

Status National: 4.11.2010
EPN: 4.11.2010

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Comparison with EPN reference solution
157 stations / 26 countries
at country specified epoch

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**EUVN DA**

Differences of the GPS/Leveling Data and the EGG08 European Geoid

- Collection of homogeneous, precise GPS and leveling height reference data
- Target: cm-accuracy height reference surface ("geoid"), consistent with ETRS89 and EVRS2007
- Support precise GPS-heighting
- Should be further densified on national level

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