



9.b. EUVN-DA status and final report

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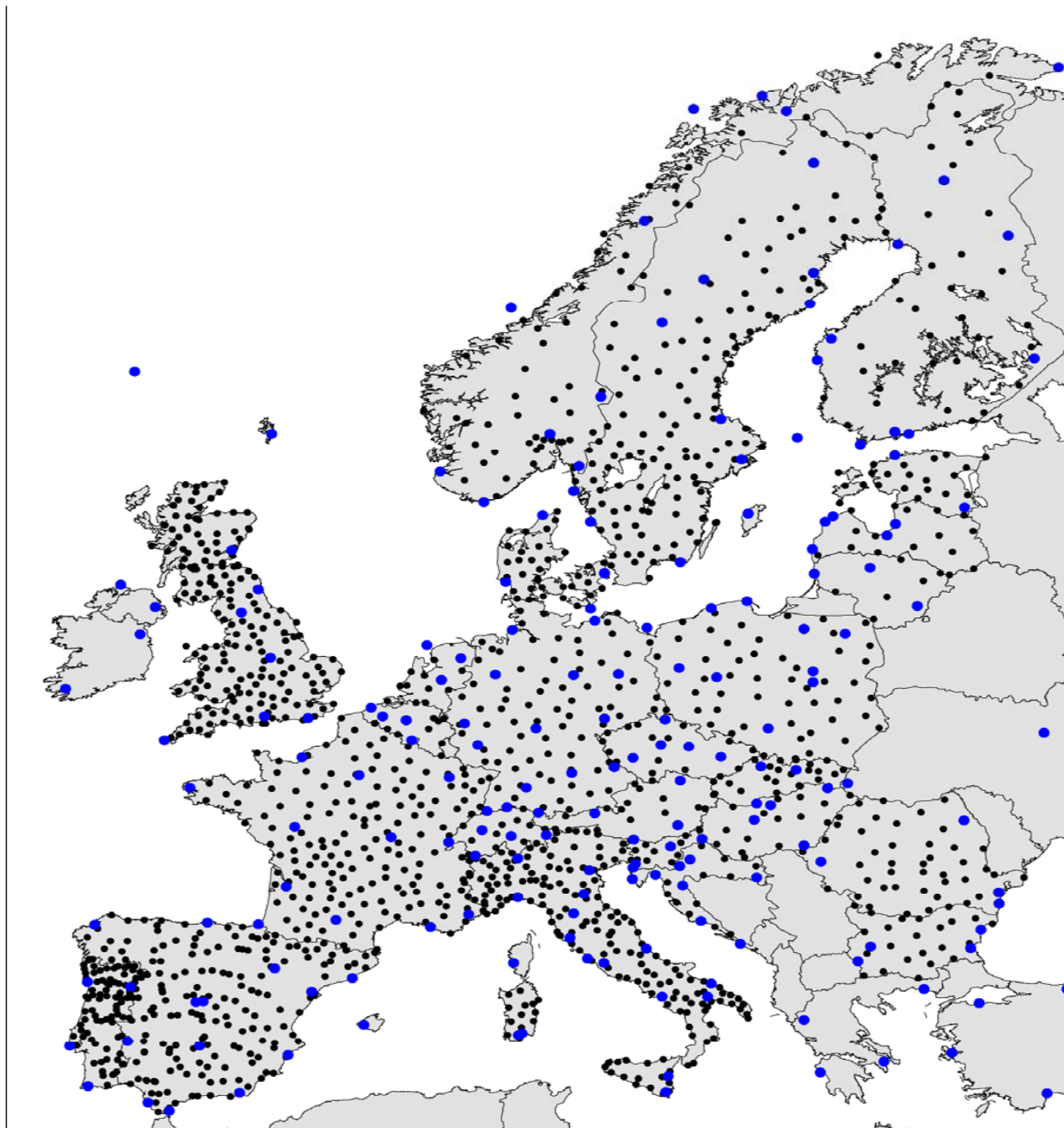


The EUVN densification and the related data (EVRF2007, ETRS89, EGG2007) is designed to

- **provide better information on the national height datum differences**
- **help identifying the gravimetric geoid, GPS and/or leveling errors**
- **serve datum information to the European geoid determination**
- **support the future realization(s) of the continental height reference surface gravimetric/GPS/levelling geoid.**

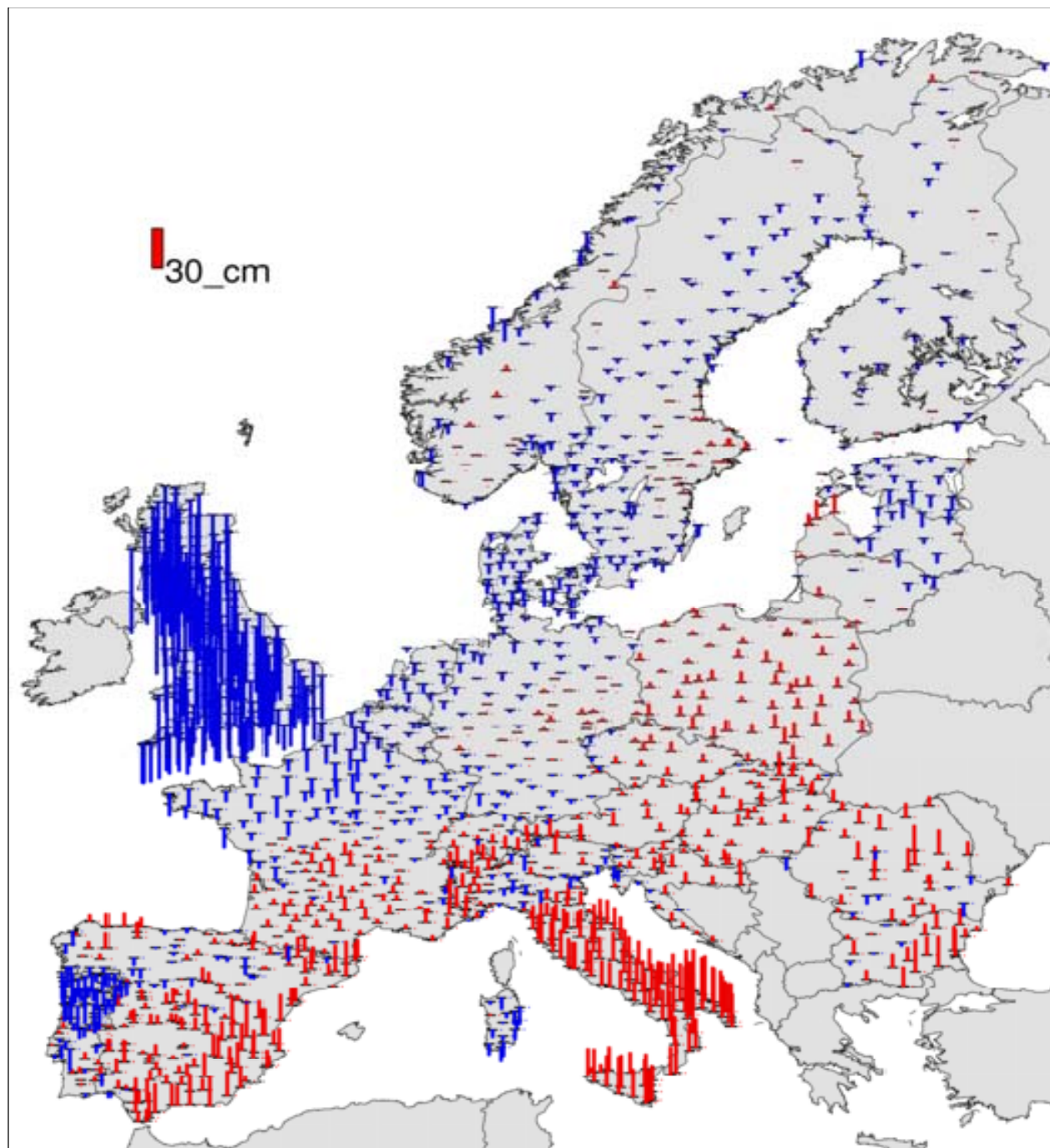


- **Distribution of
the EUVN and
EUVN_DA
benchmarks
(blue and black
dots,
respectively) as
of March 2009**



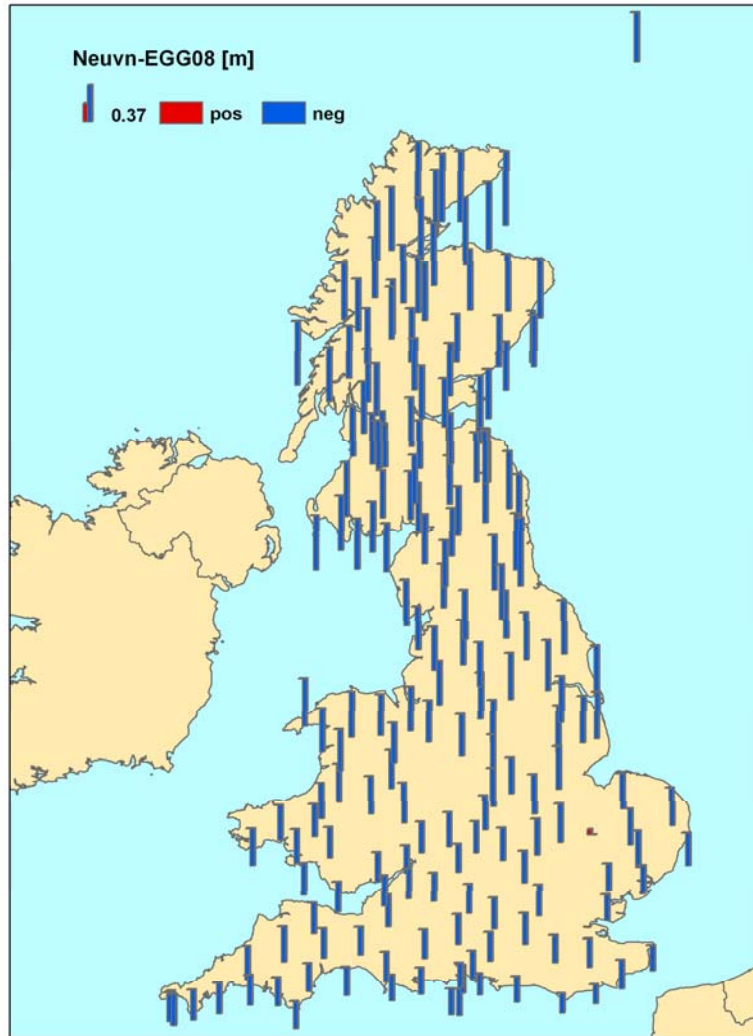


- **Height anomaly differences of EUVN_DA and EGG08**





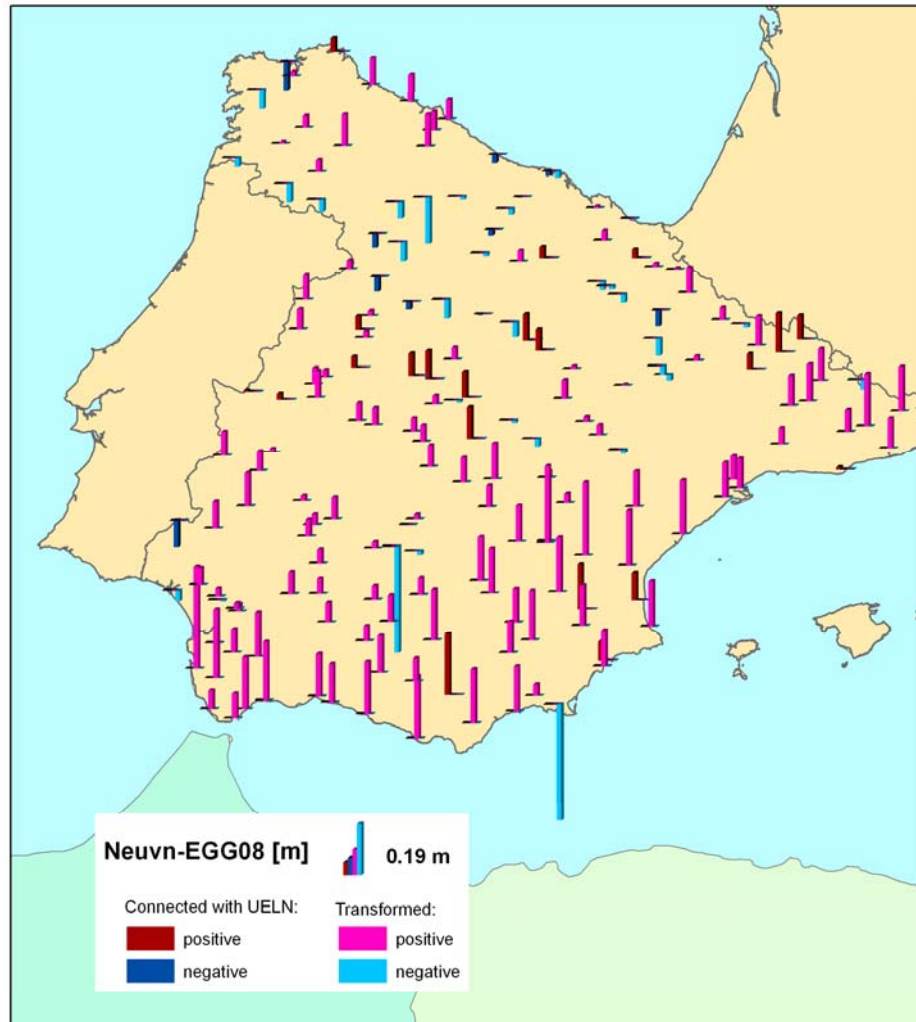
EUVN_DA weak points - UK



- EUVN_DA stations not directly connected with UELN
- height transformation from national system to EVRF2007
- computation of transformation parameters: maximum residuals between -5 and + 8 cm
- height connection to the mainland in the EVRF2007 only by hydrodynamic leveling – possibly datum offset?
- publication by *Edge* (1959) suspects a tilt in the UK leveling network



EUVN_DA weak points - Spain



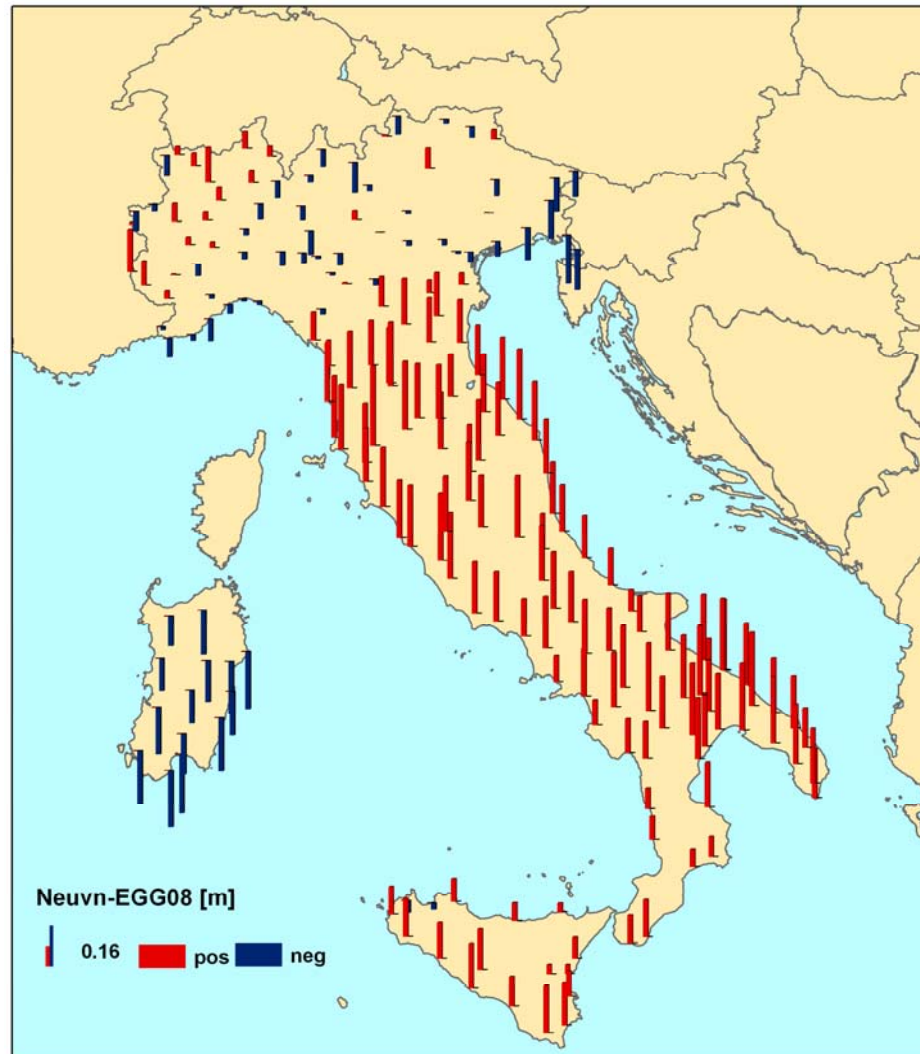
- 30 stations directly connected to UELN,
- for 142 stations only height transformation from national heights to EVRF2007



- differences between orthometric heights (Spain) and normal heights (EVRF2007) depends on the height → transformation errors in the mountains
- better possibility: transformation of geopotential values (was used in Portugal)
- this needs:
 - knowledge of applied formula for orthometric correction
 - gravity values of the EUVN_DA stations – not available
- EUVN_DA stations of Spain are connected to the new national leveling network
- measurements not available yet at the UELN data and computation center



EUVN_DA weak points - Italy



- EUVN_DA stations not directly connected with UELN
- height transformation from national system to EVRF2007
- computation of transformation parameters: maximum residuals between -9 and + 7 cm
- different transformation parameters derived from different sets of identical points were used – all without satisfactory results



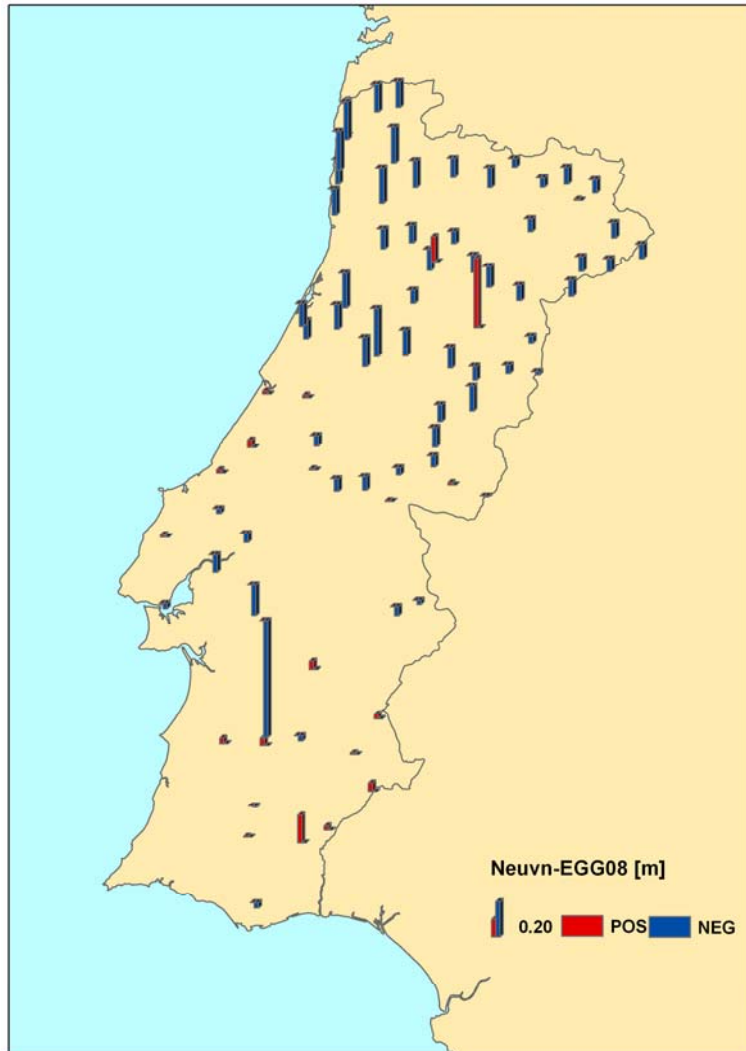
Unexplainable differences in leveling data in Italy



- for all 195 leveling points **"Height a.m.s.l. Genova (IGM95)"** is given
- for 44 leveling points additionally geopotential values and gravity are available
- graphic shows differences between national heights provided by Italy and heights computed from geopotential values (no fundamental difference between comparing normal or orthometric heights)
- it looks like a mix of different height reference systems



EUVN_DA weak points - Portugal



- EUVN_DA stations not directly connected with UELN
- transformation of geopotential values from national system to EVRF2007, afterwards computation of normal heights
- computation of transformation parameters: maximum residuals between -1 and +1 kgal·cm



Statement

- **EUVN-DA initiated a special development for our European reference systems**
- **we have find new aspects which we have to consider and to investigate, the investigations are not finished**
- **The final report for the EUVN-DA project was postponed again and again.**
- **It is my opinion to close the EUVN-DA project. Therefore I propose to prepare the EUVN-DA final report to the agenda of the next TWG meeting. In the final report the open questions have to be mentioned.**
- **The improvement of the GNSS/levelling data in Europe is a permanent process. I propose to continue the improvement of the EUVN-DA aspects in the frame of the European levelling network.**