Preliminary results with the Computation of the new Italian Permanent Network RDN of GPS stations

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RDN Rete Dinamica Nazionale

- Network of 100 permanent GPS sites
- 69 are Italian, permanent, non EPN sites
- 31 sites are also part of EPN
- Four weeks of continuous observation: weeks 1459-1462, with 2008.0 as reference epoch
- Processing is underway at IGMI, Politecnico di Milano and University of Padova;
- EPN guidelines followed throughout
- Final results expected Fall 2008 for submission to TWG as regional ETRS89 densification

Preliminary results

• 100 sites processed in 28 daily sessions; 9 EPN sites are in bordering Countries

•Daily NEQ files generated with minimum constraints

Intrinsic repeatibility verified at mm level in 3D

•Corresponding SINEX files

EUR14597.SNX, EUR14607.SNX, EUR14617.SNX,

EUR14627.SNX

downloaded from EPNCB

• 28 daily Neq's combined with the 4 EPN Neq's: 22 common station in Italy + 9 in neighbouring countries

•MC on the 26 stations used by BKG to realize IGS05 weekly

•Resulting coords are Helmert compared (3T) to EUR14607.SNX



Combination scheme



Basic idea: Embed the RDN into the EPN

Following Gurtner et al. (1997) procedure, combine EPN sinex with RDN sinex;

Use for MC the same stations as BKG for weekly ITRF05 realization in Europe



MC Stations: EUR14607 vs. RDN+EUR How do the coords of MC stations in the densified network differ from their a priori values in EUR14607.SNX? 8 6 4 2 **d** 0 mm ľ -2 -4 -6 Solved for Tx Ty Tz are <0.1mm +/-0.2 mm, -8 rms of fit = 2.3 mm-10 BOR1 BRUS CAGL GLSV GLSV GLSV GLSV GLSV GRAS HOFN NAT NAT NICO NYA1 NICO NYA1 NICO NYA1 NICO NYA1 NICO NYA1 VILL WSRT SFER ZIMM EPN stations used for MC

■ North: 1.2 mm ■ East: 1.0 mm ■ Up: 4.0 mm

Repeatibility of ITRF05 coordinates: MATE



Repeatibility of ITRF05 coordinates: IGMI



Repeatibility of ITRF05 coordinates: PADO





EUR(1459:1462)7.SNX realization

Repeatibility of ITRF05 coordinates: LAMP



Preliminary Conclusions

- Scale, orientation and origin look OK
- Full consistency with EUR realization of ITRF05(2008.0)
- Repeatibility is at mm to sub mm level across the 4 weeks range
- Effect of different constraints still to be checked
- ITRF05 results at this stage. ETRF00/05 later, once the analysis is complete