The temporary ILRS reference frame: SLRF2005

e-GEOS

V. Luceri
e-GEOS S.p.A., CGS - Matera

agenzia spaziale italiana

G. Bianco
Agenzia Spaziale Italiana, CGS - Matera

ILRS Fall Meeting, 24-28 September 2007, Grasse

Existing Reference Frame

Benefits from :

ITRF2000

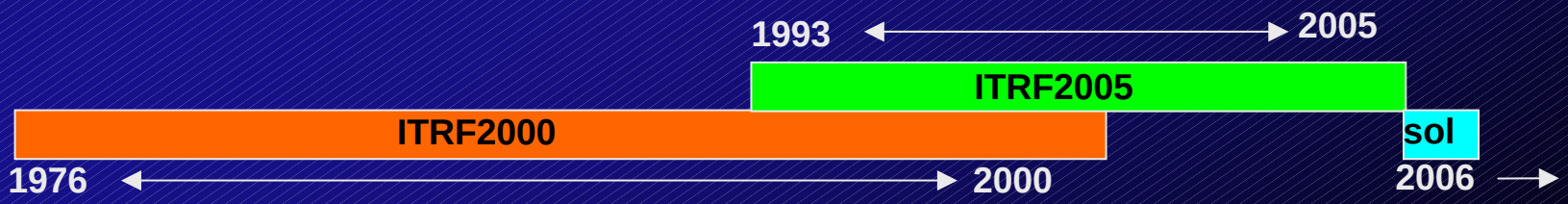
- Pre-1993 sites

ITRF2005 rescaled

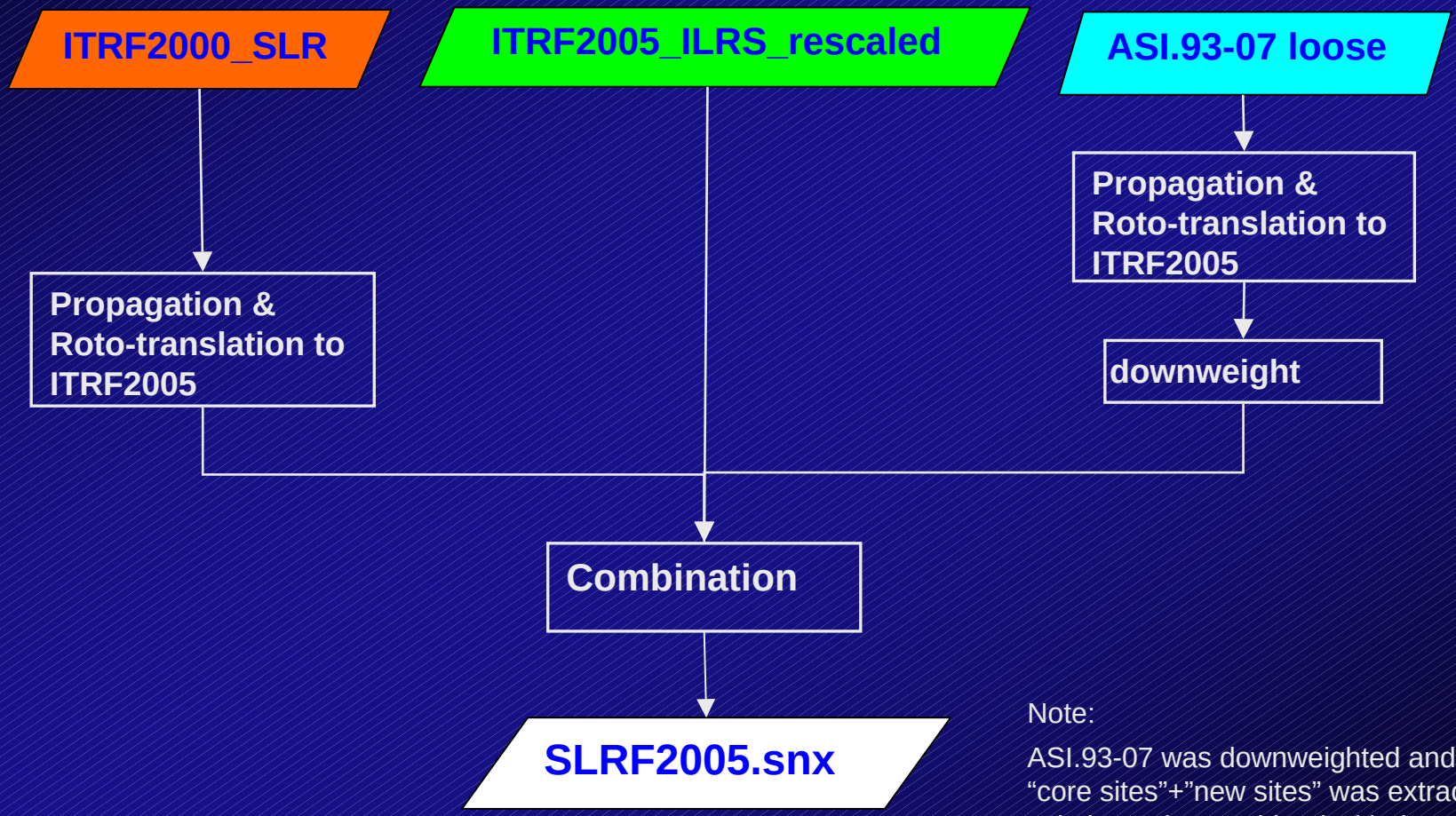
- New models, better estimates
- New sites up to 2005

Updated solution

- New sites since 2006



SLRF2005 generation flowchart



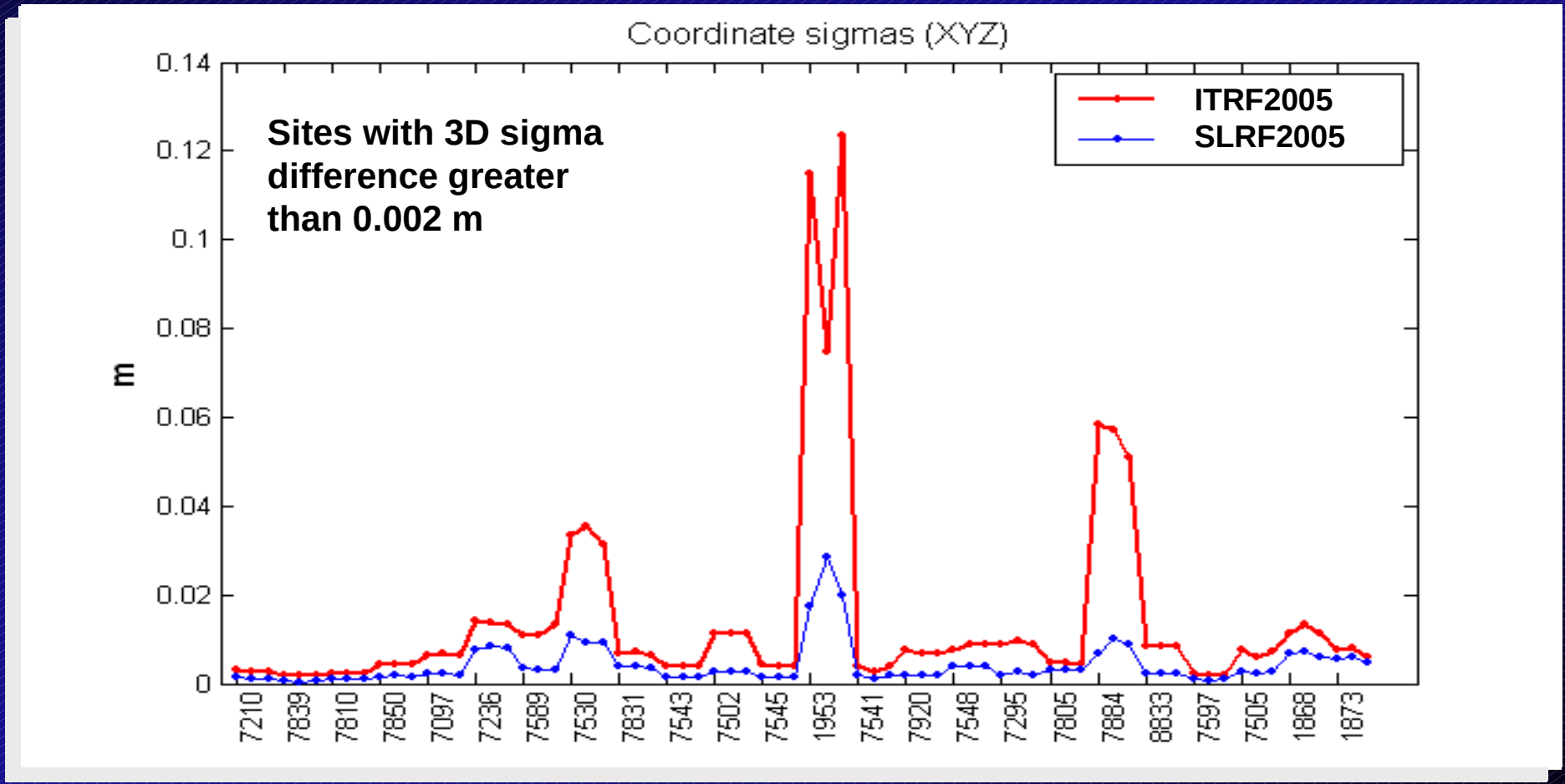
Note:

ASI.93-07 was downweighted and a subnetwork of “core sites”+”new sites” was extracted from the solution to be combined with the other 2 TRF with the aim to minimize its influence over the network.

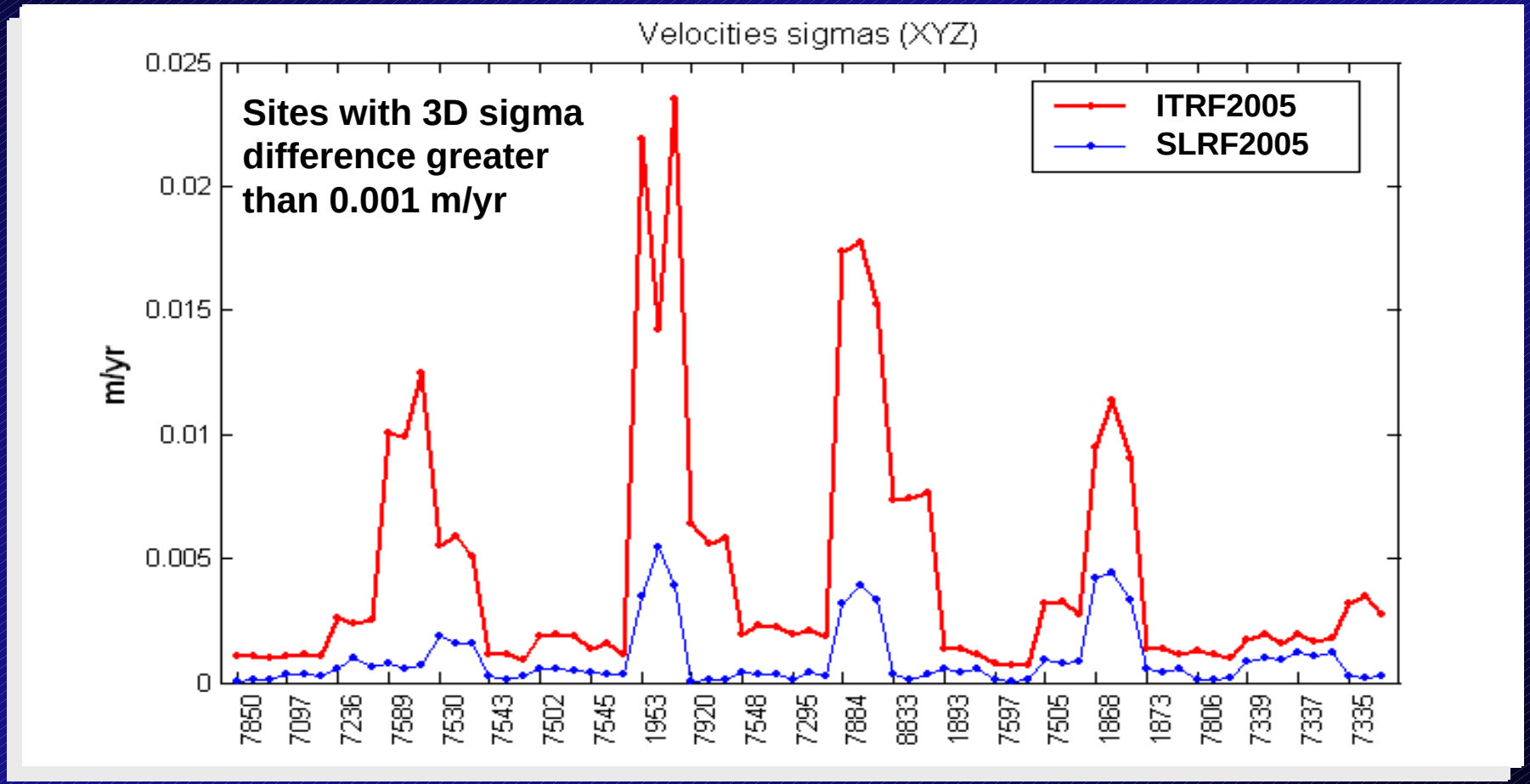
Bad stations in ITRF2005 – edited before combination

```
+SOLUTION/EPOCHS
*Code PT SOLN T Data_start__ Data_end____ Mean_epoch__
 7122  A    1 C 92:364:20108 93:010:41381 93:004:30953    ok in ITRF2000
 7123  A    1 C 93:112:25806 93:310:42948 93:211:34377    ok in ITRF2000
 7883  A    1 C 93:335:28394 94:042:64147 94:006:46271    ok in ITRF2000
 7882  A    1 C 94:075:53242 94:130:15383 94:102:77512    ok in ITRF2000
 7411  A    1 C 94:193:04556 94:258:43738 94:225:67347    ok in ITRF2000
 7525  A    1 C 94:199:13073 94:279:84021 94:239:48547    ok in ITRF2000
 7520  A    1 C 95:238:65872 95:260:74471 95:249:70172    ok in ITRF2000
 7847  A    1 C 96:098:46968 96:105:50693 96:102:05631    bad also in ITRF2000
 7307  B  1 C 97:253:56118 97:298:62932 97:276:16325  not in ITRF2000, discarded
 7307  D  1 C 99:260:46043 99:288:43839 99:274:44941  not in ITRF2000, discarded
 7355  A  1 C 01:119:62133 01:145:75983 01:132:69058  not in ITRF2000, discarded
 7830  A  1 C 03:097:70658 03:290:51783 03:194:18021  not in ITRF2000, discarded
 7357  A  1 C 03:217:45220 03:290:67834 03:254:13327  not in ITRF2000, discarded
 7823  A  1 C 04:172:04739 04:178:01370 04:175:03054  not in ITRF2000, discarded
 7130  A  1 C 05:213:45454 05:307:03282 05:260:24368  not in ITRF2000, discarded
 7358  A  1 C 05:214:30940 05:333:72723 05:274:08632  not in ITRF2000
```

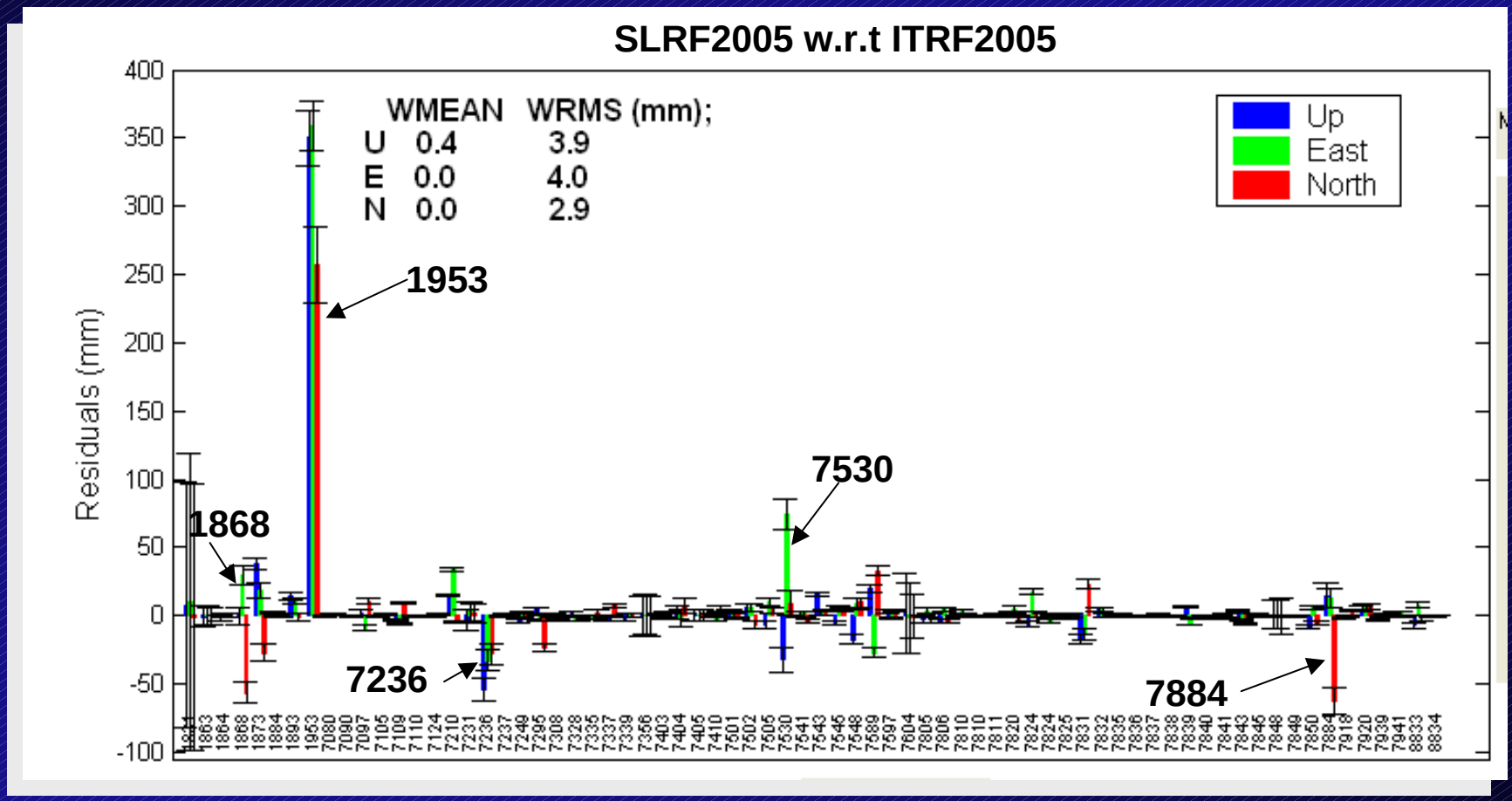
Coordinate sigma comparison



Velocity sigma comparison

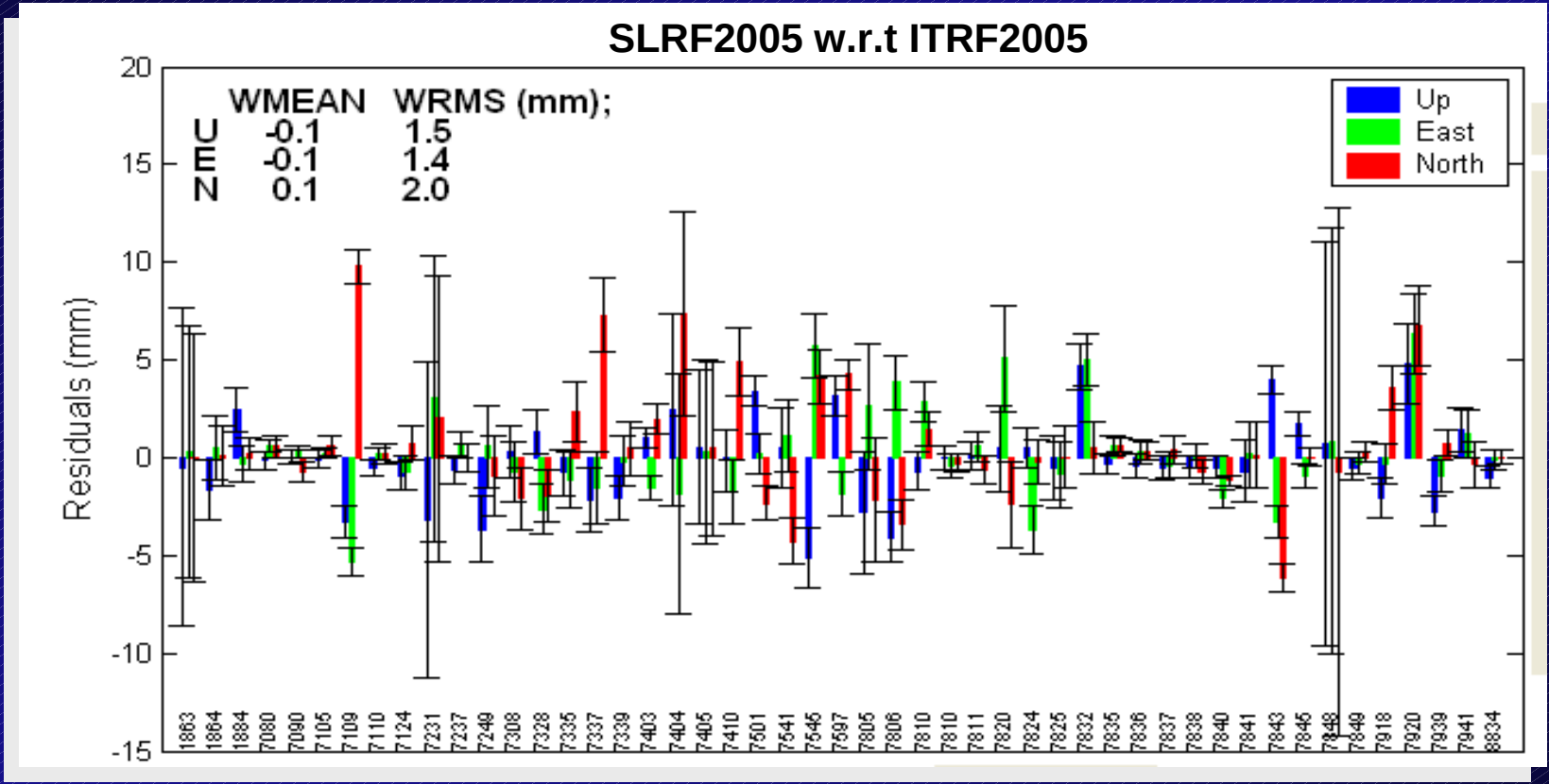


SLR2005 coordinate comparison: full network



Higher residuals for those sites with short history in one of the two frames

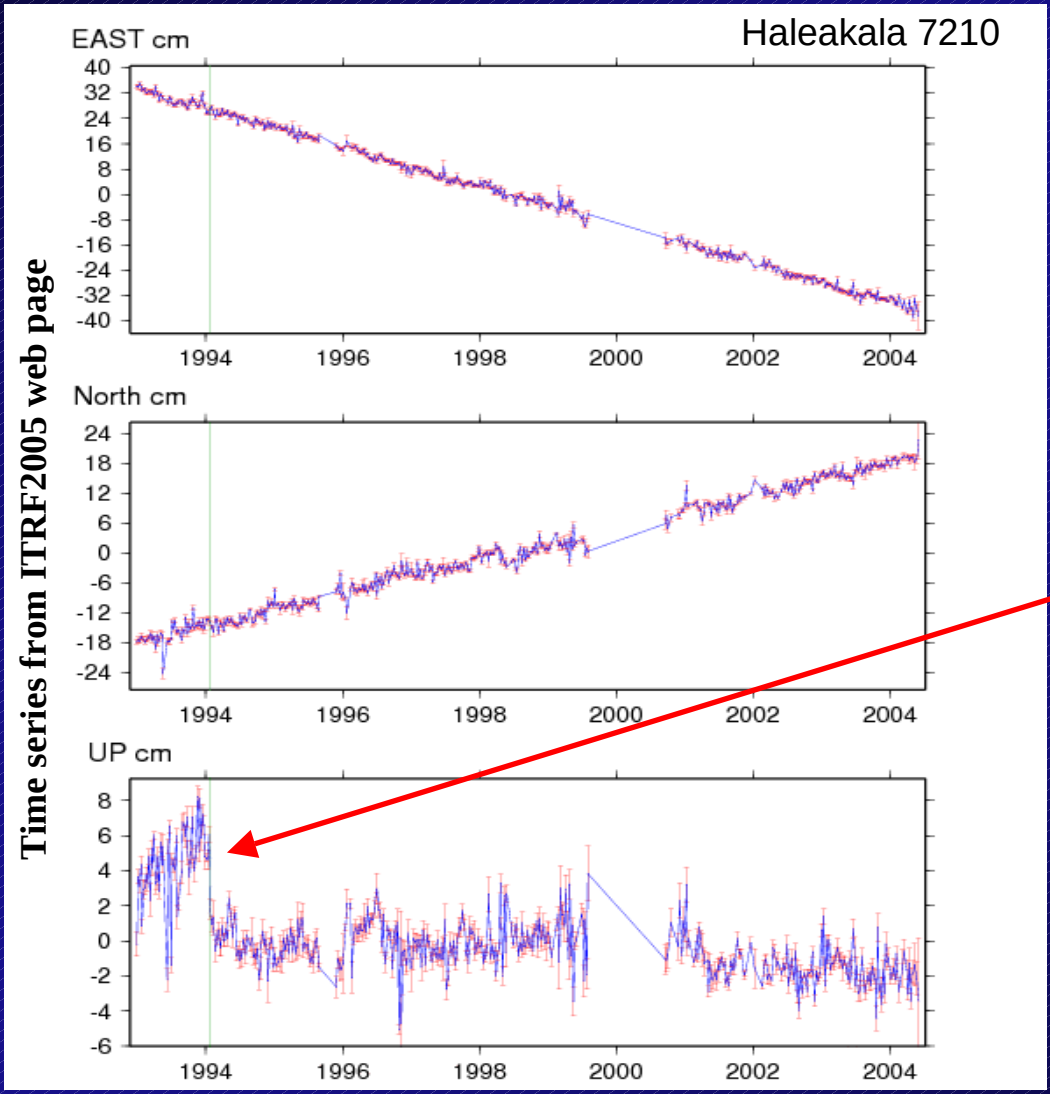
SLR2005 coordinate comparison: selected sites



Edited sites: **all SOLN > 1 for 7210, 7839, 7840, 7403**
1953, 1868,1873,7884,7236,7530,1831,7589, 7294,7824A , 7502, 7505
7543,7850, 7097,7831,1893,7604, 7839,8833,7548,7356

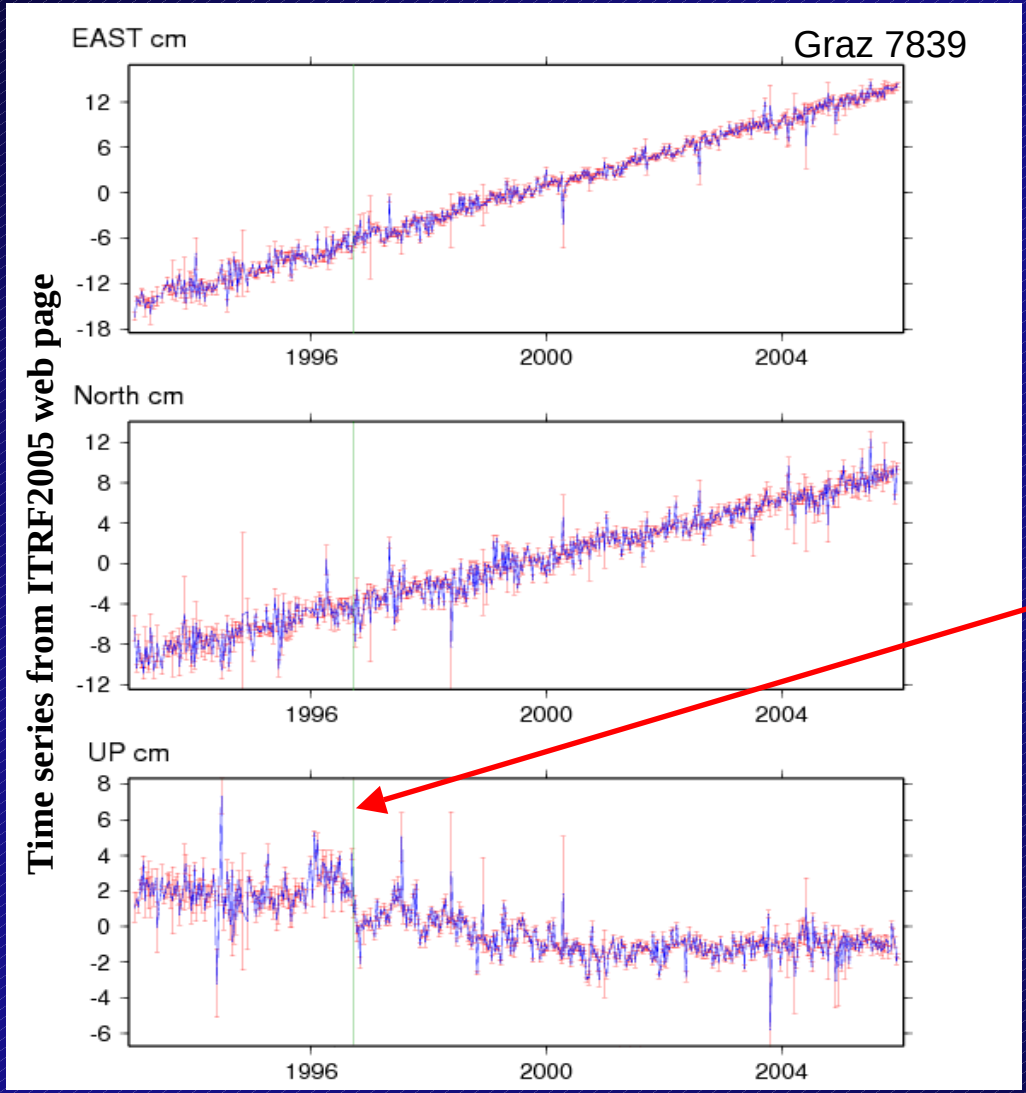
Most of this sites have a longer history in ITRF2000

Stations with jumps: Haleakala (7210)



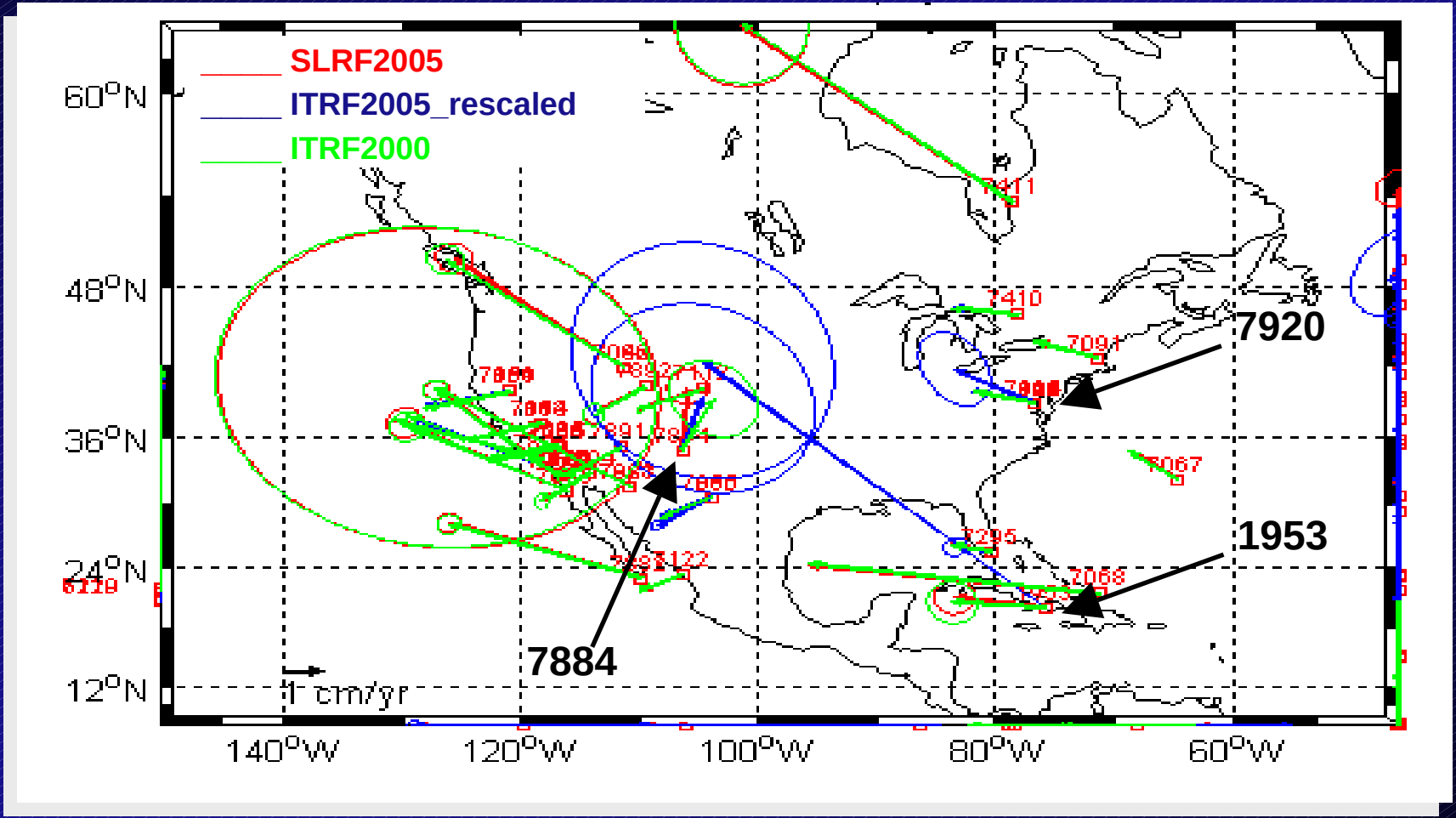
ITRF2005 SOLN 1 combined with ITRF2000 to get a better estimate (above all for velocities)

Stations with jumps: Graz (7839)

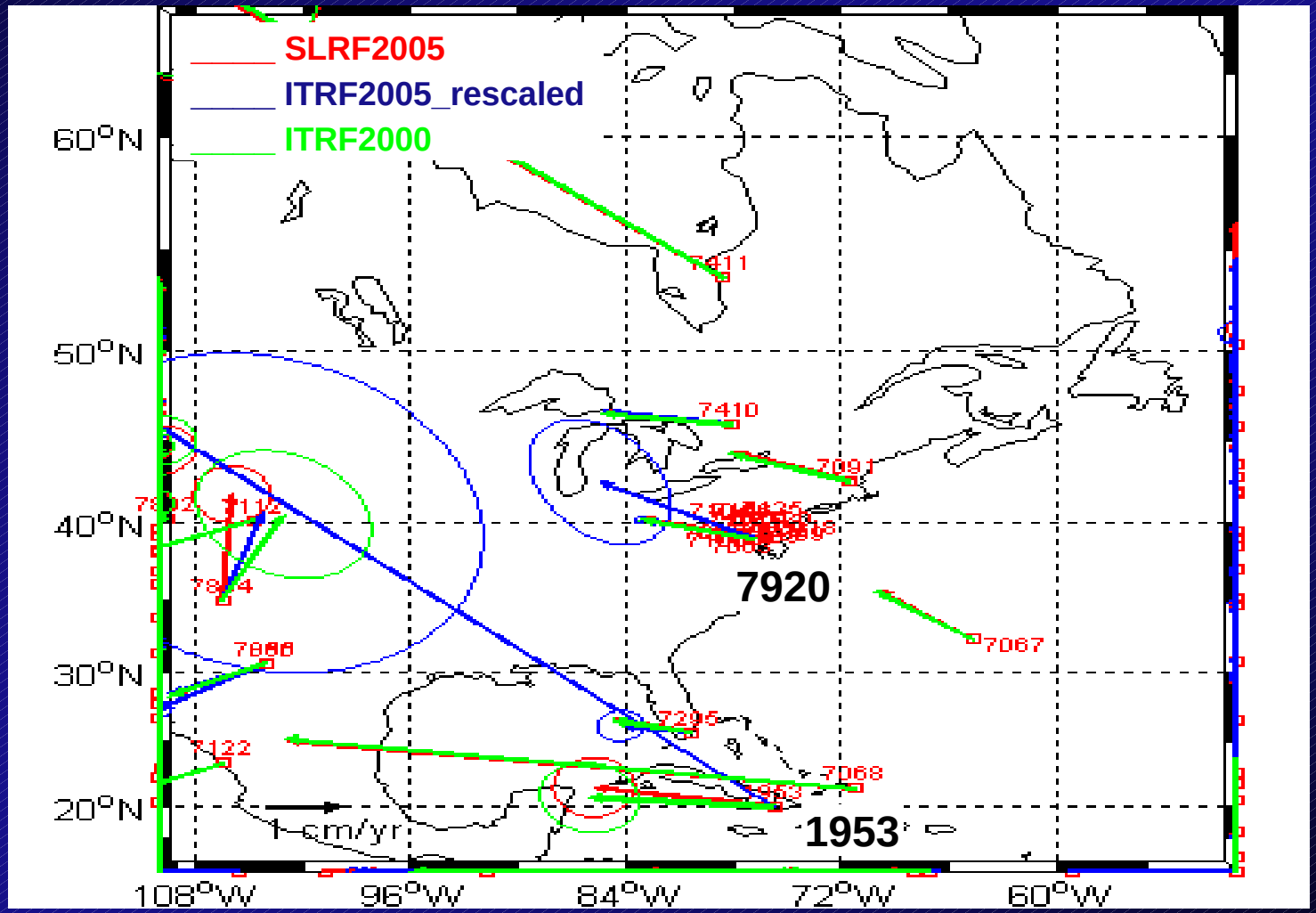


ITRF2005 SOLN 1 combined with ITRF2000 to get a better estimate

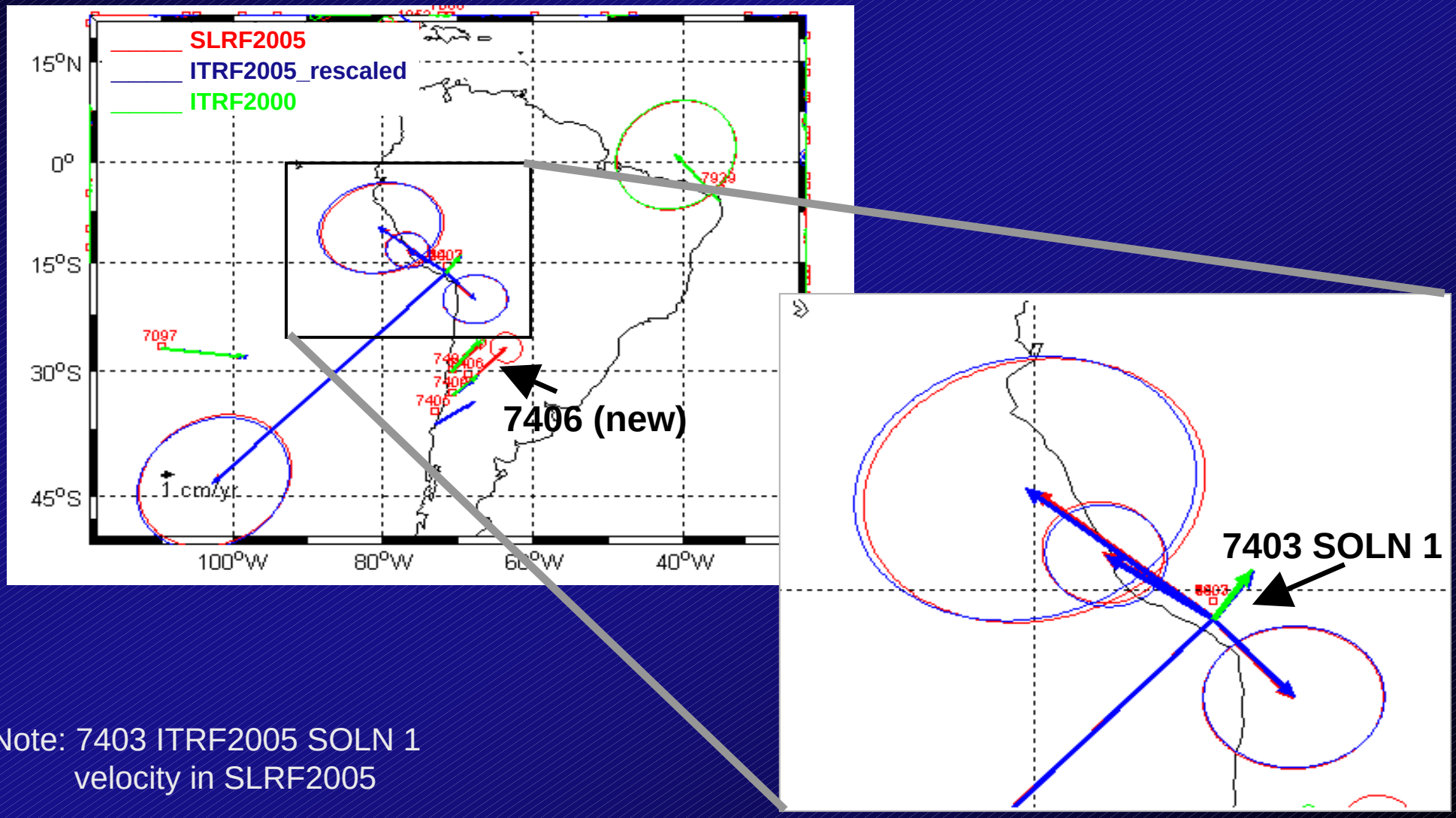
Velocities: North America



Velocities: North America

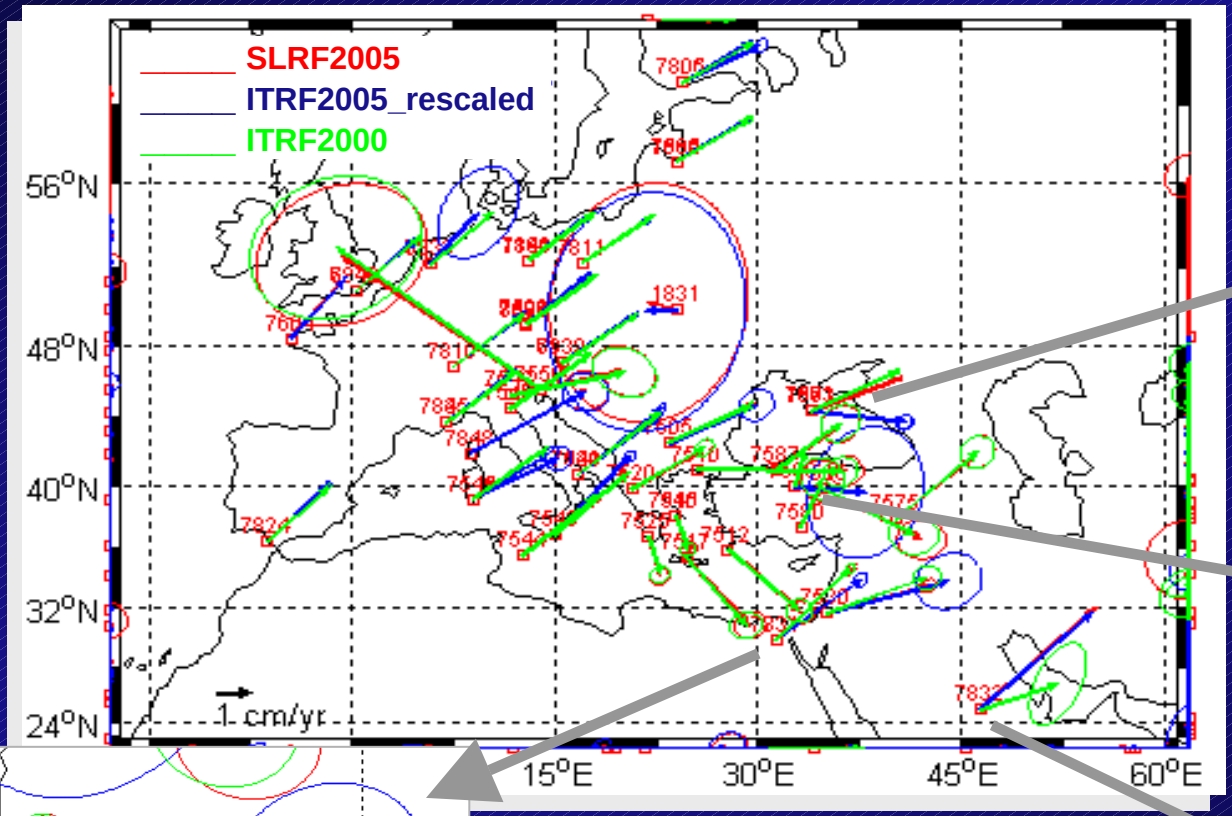


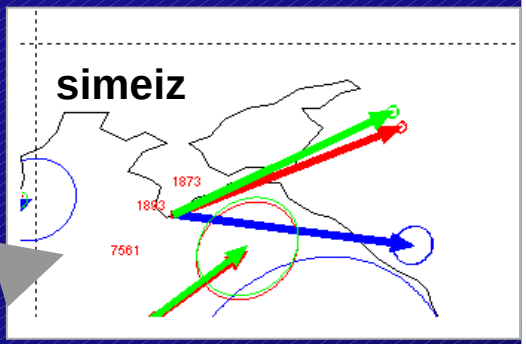
Velocities: South America

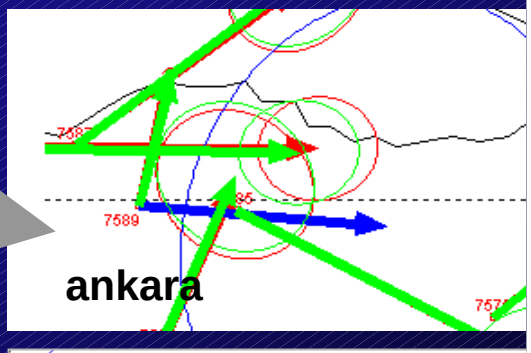


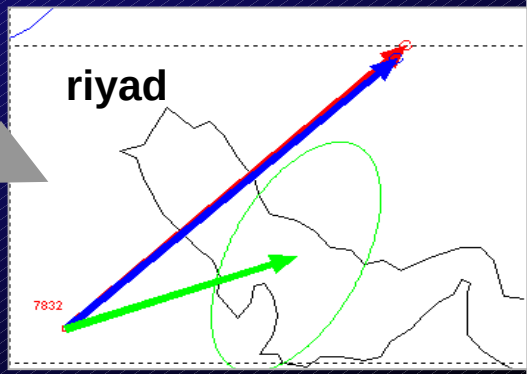
Note: 7403 ITRF2005 SOLN 1 velocity in SLRF2005

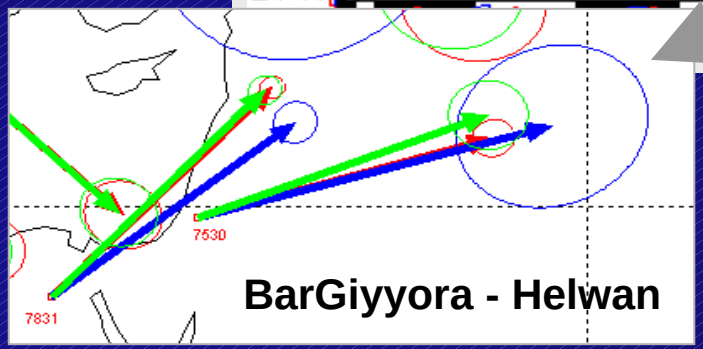
Velocities: Europe



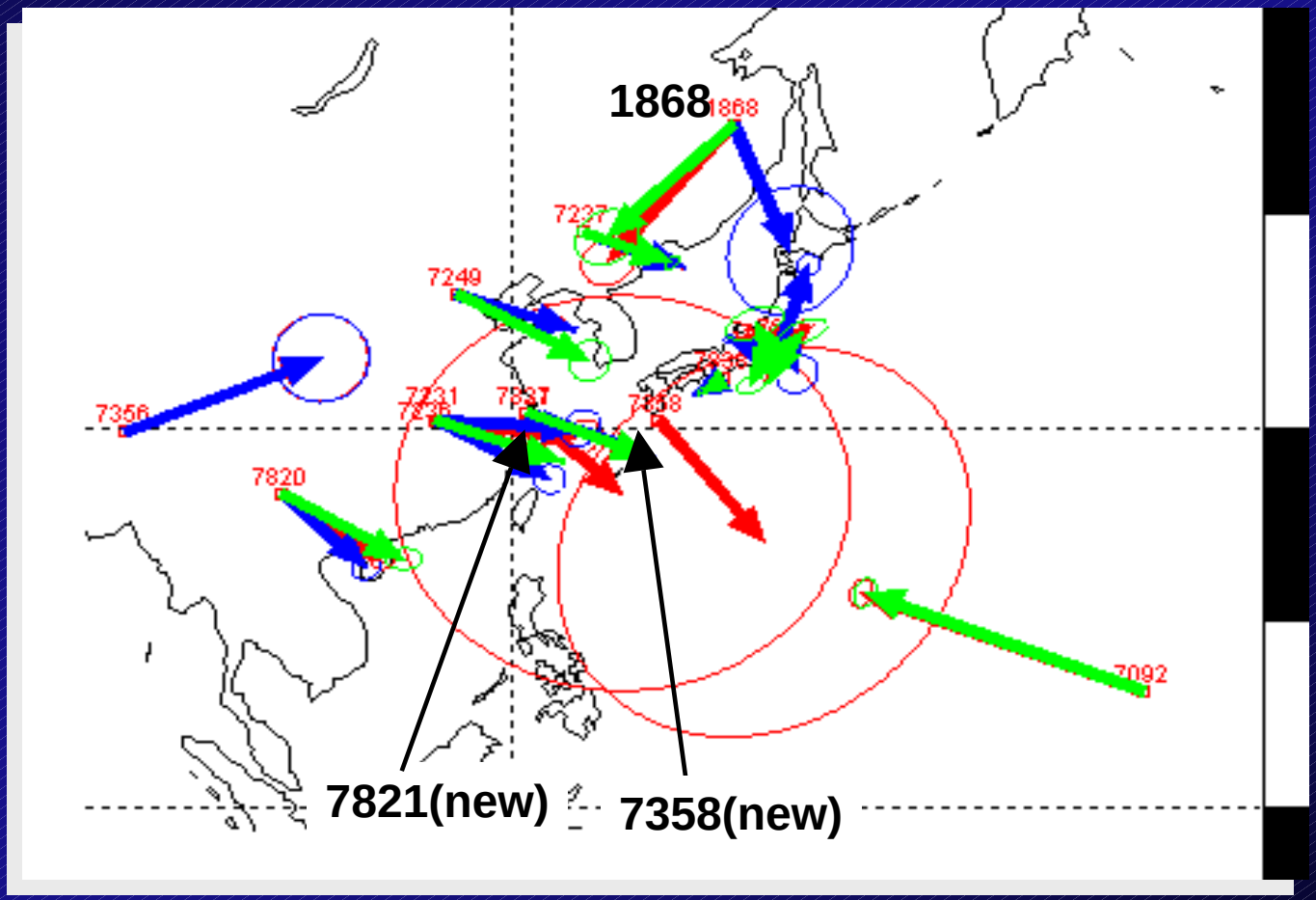








Velocities: Western Pacific



Conclusions

- SLRF2005 is temporary until a new ILRS reference frame will be set
- It takes the best from ITRF2000 and ITRF2005
- All SLR sites are represented in one reference frame