
Rigorous combination of high-frequency ERPs and troposphere parameters from GPS, VLBI and SLR (CONT02)

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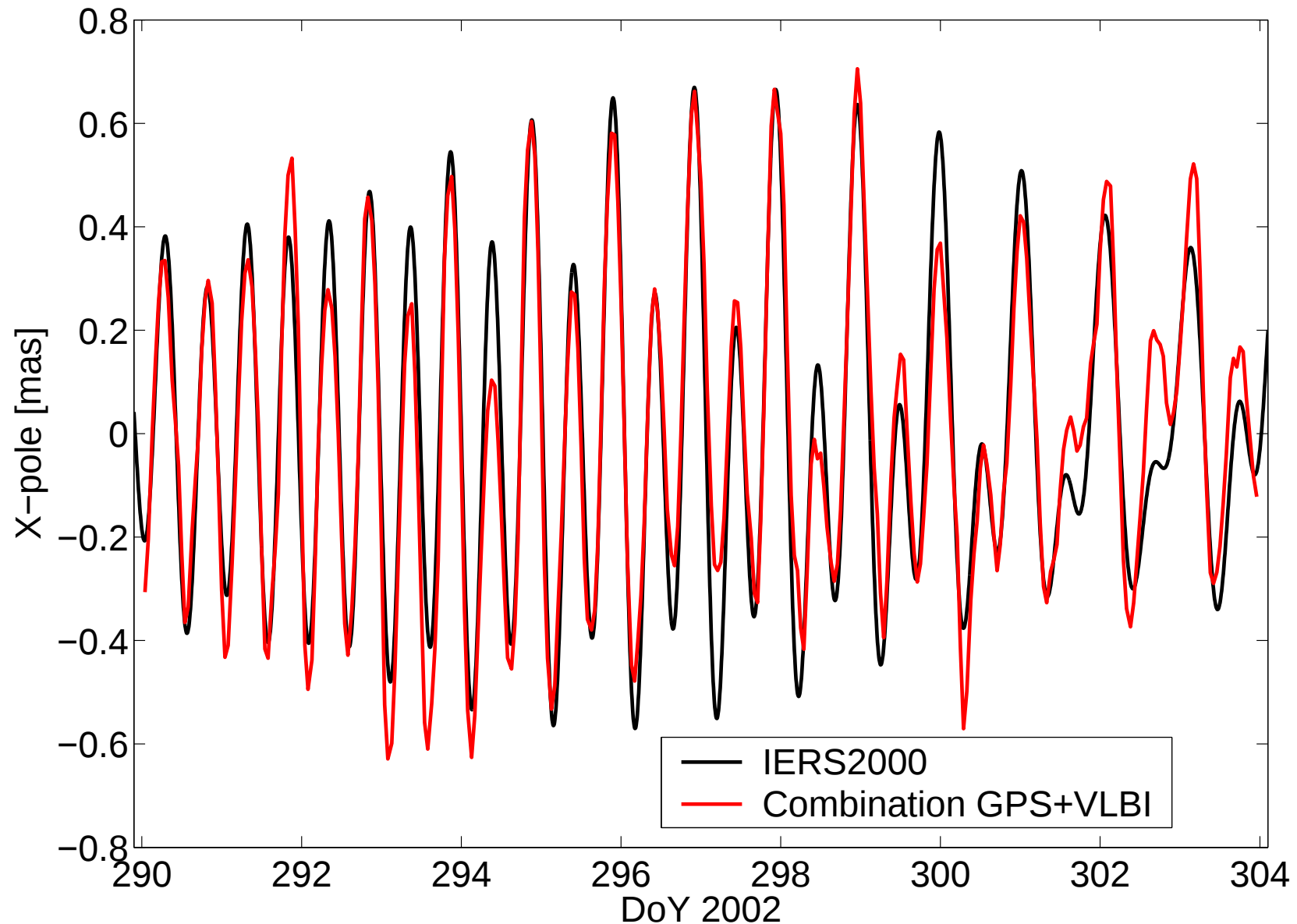
1) Forschungseinrichtung Satellitengeodäsie (FESG), TU Munich

2) Deutsches Geodätisches Forschungsinstitut (DGFI), Munich

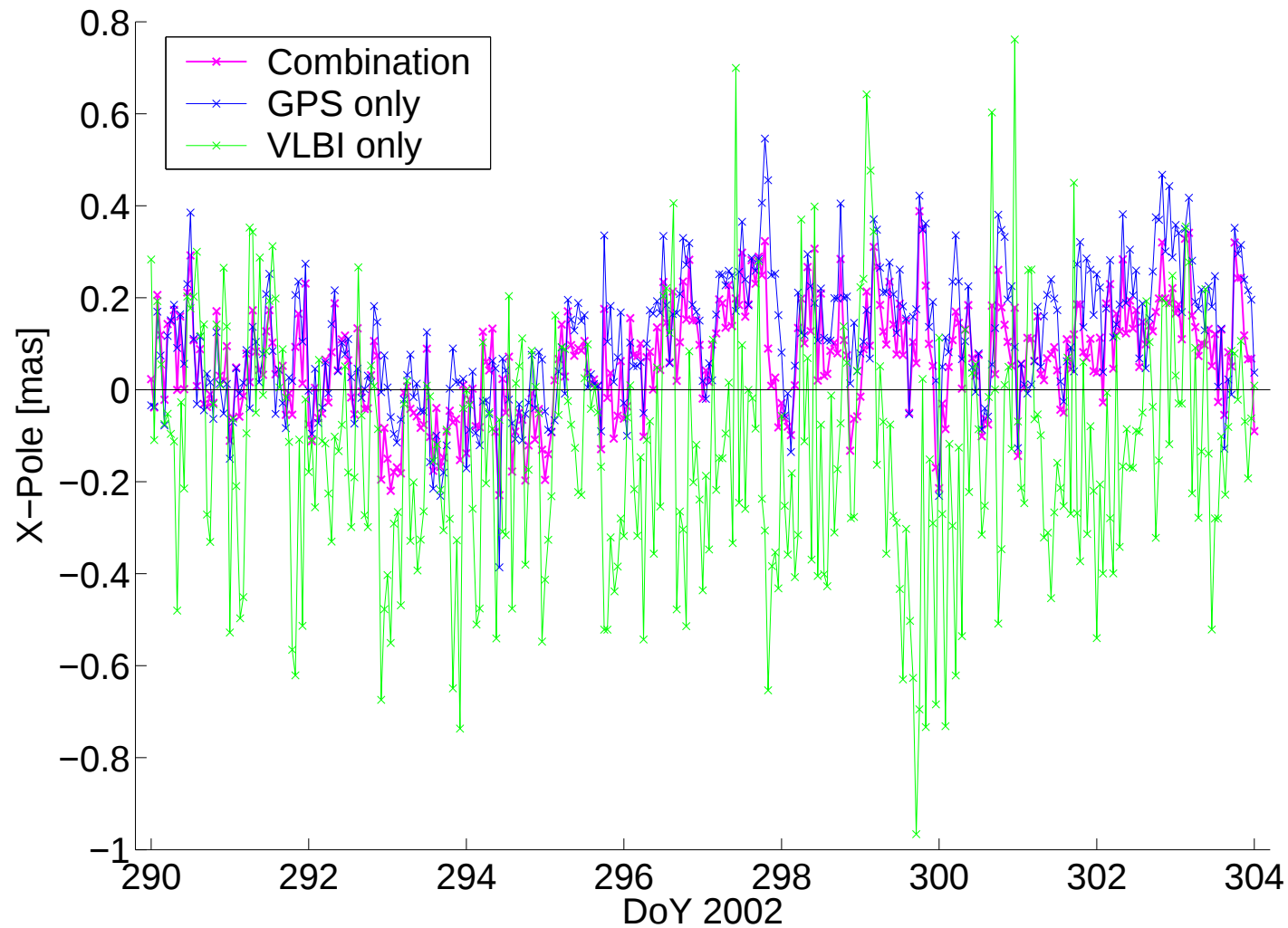
IERS Workshop 2004: „IERS Combination Pilot Project“,
December 11, 2004, Napa

Sub-Daily ERP: X-Pole

Comparison of sub-daily ERPs

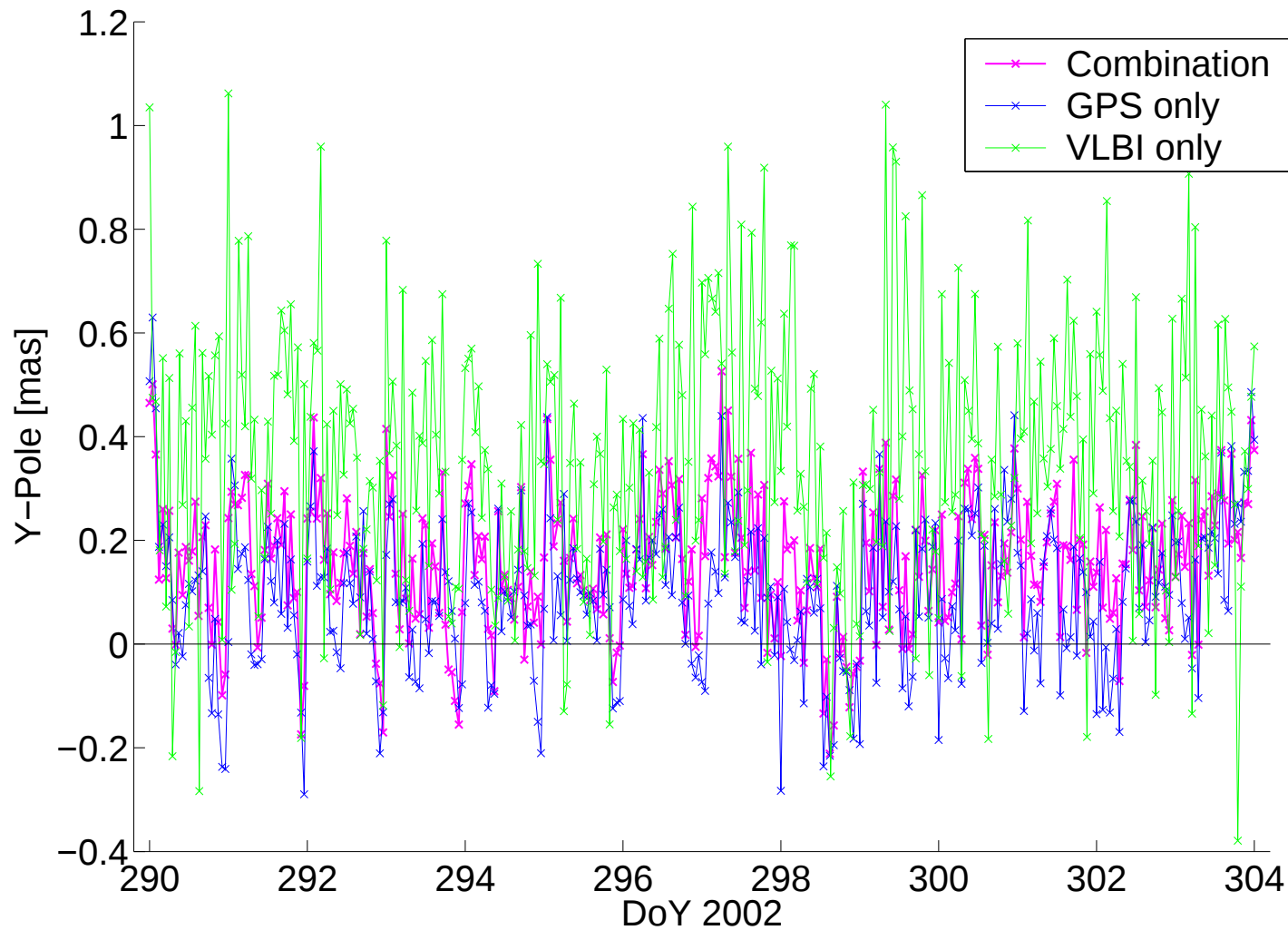


Sub-Daily ERP: X-Pole



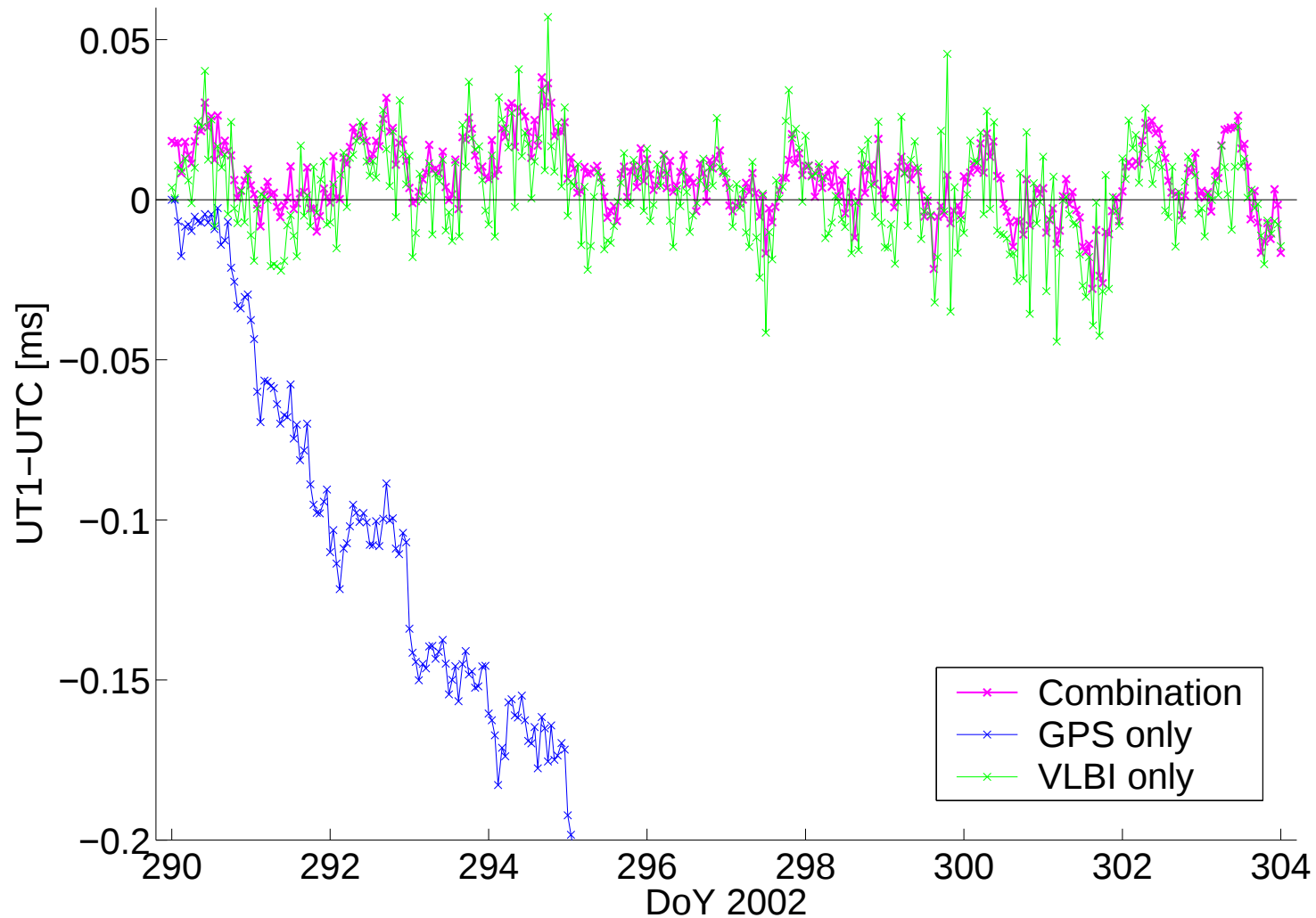
RMS X-Pole:	Combination:	0.120 mas
	GPS:	0.143 mas
	VLBI:	0.259 mas

Sub-Daily ERP: Y-Pole



RMS Y-Pole: **Combination:** **0.130 mas**
 GPS: 0.144 mas
 VLBI: 0.253 mas

Sub-Daily ERP: UT1-UTC



<i>RMS UT1-UTC:</i>	Combination:	0.011 ms
	GPS:	(0.182 ms)
	VLBI:	0.015 ms

Different Parameterization and Temporal Resolution

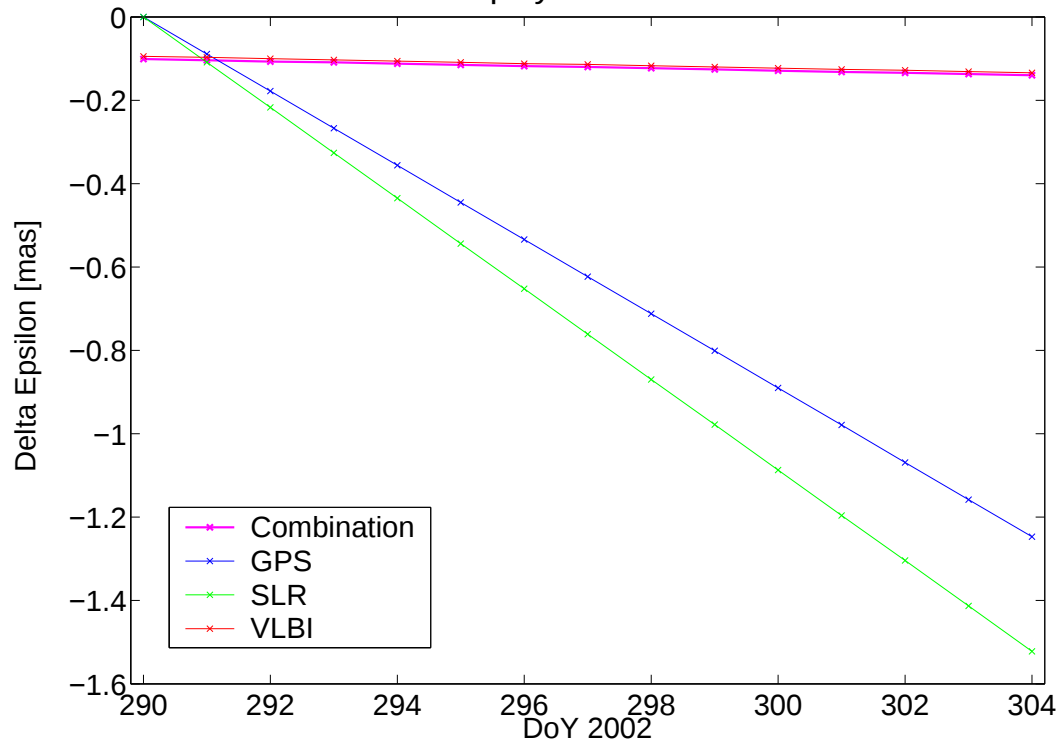
X-Pole: Differences to C04



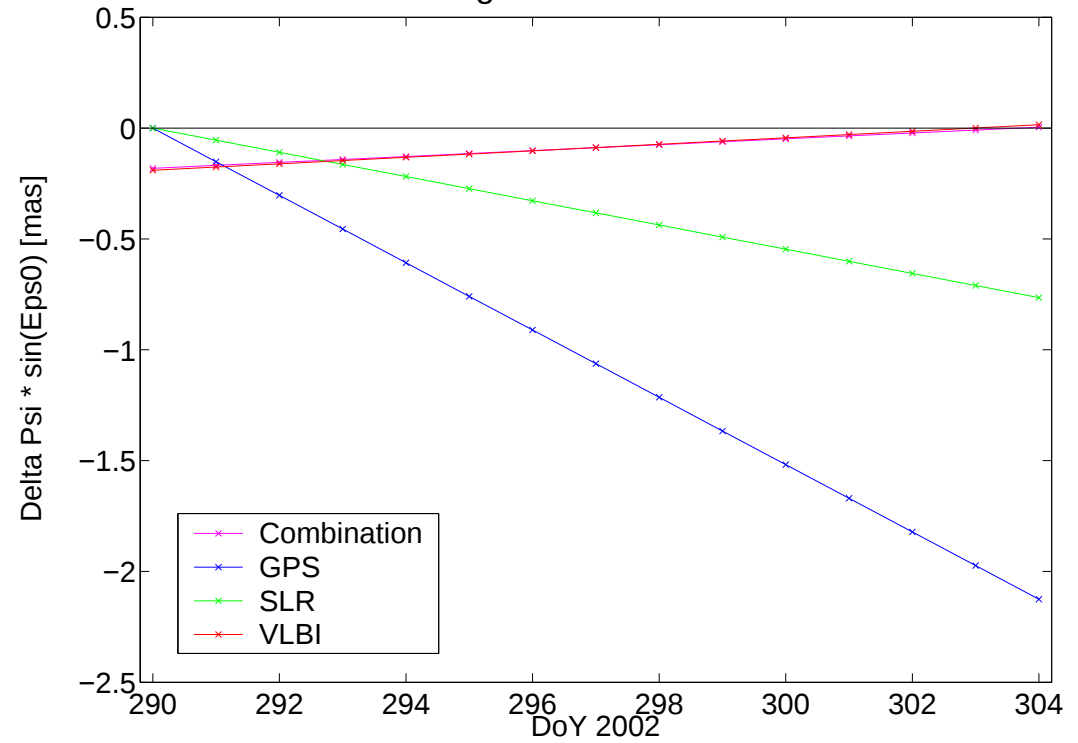
	<i>Comb.</i> ΔRMS	<i>GPS</i> ΔRMS	<i>VLBI</i> ΔRMS
<i>XP</i>	<i>0.023 mas</i> <i>19%</i>	<i>0.031 mas</i> <i>22%</i>	<i>0.023 mas</i> <i>9%</i>
<i>YP</i>	<i>0.029 mas</i> <i>22%</i>	<i>0.007 mas</i> <i>5%</i>	<i>0.047 mas</i> <i>19%</i>
<i>UT</i>	<i>0.002 ms</i> <i>18%</i>	- -	<i>0.002 ms</i> <i>13%</i>

Nutation: Estimates

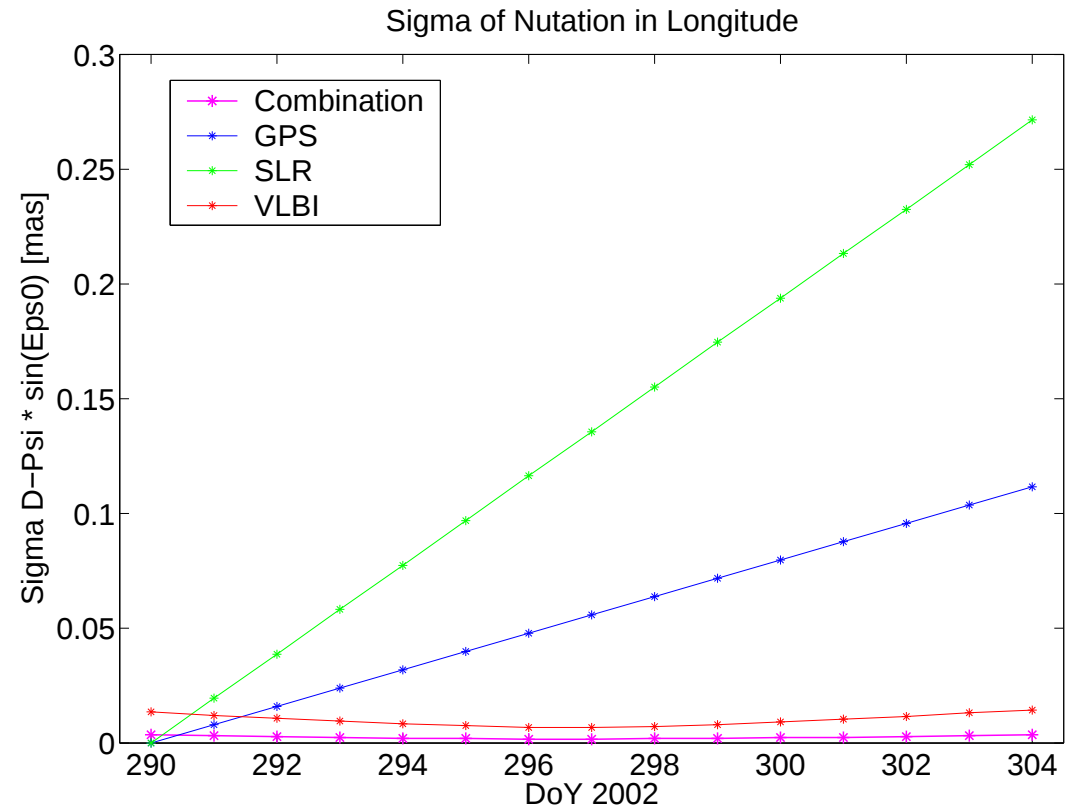
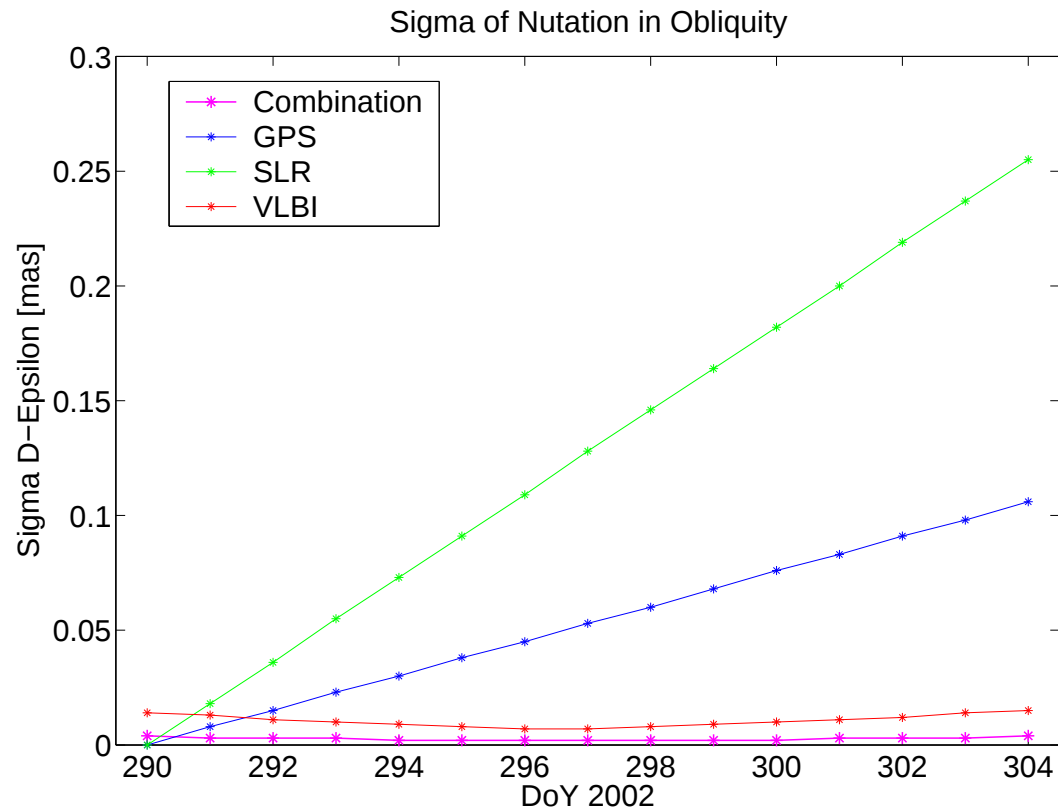
Nutation in Obliquity: Differences to IAU2000



Nutation in Longitude: Differences to IAU2000

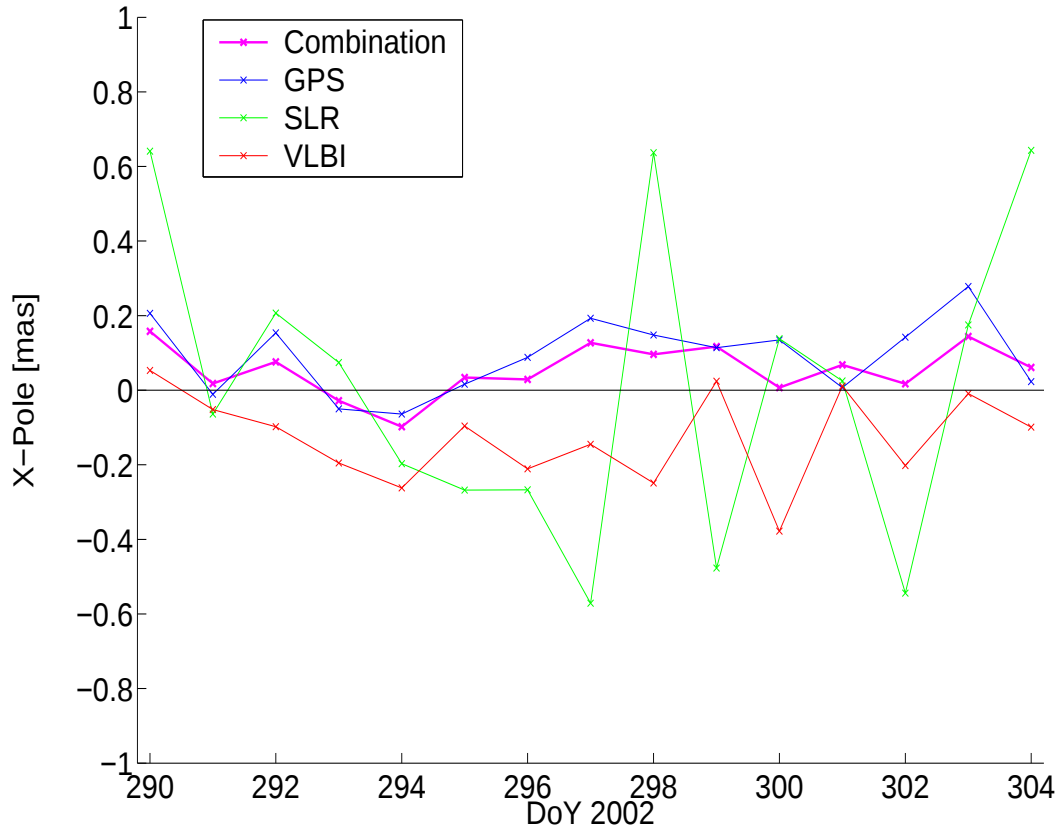


Nutation: Formal Errors

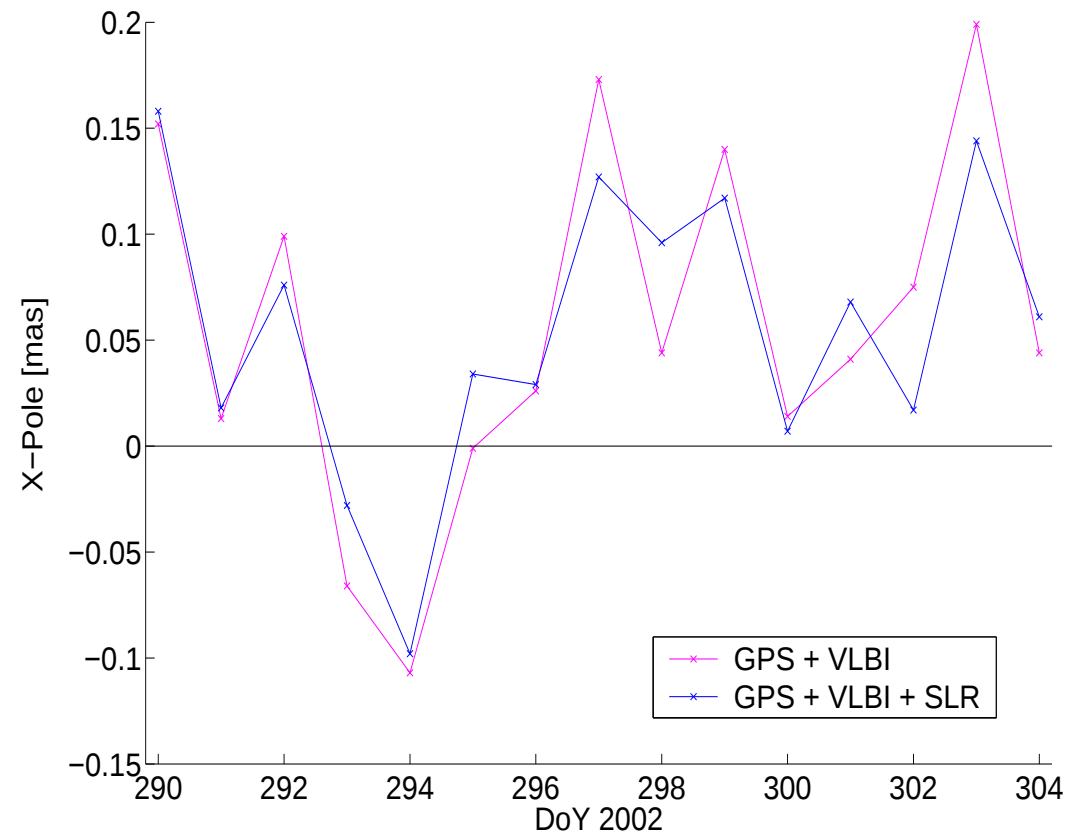


Daily ERP for GPS, VLBI, SLR

X-Pole: Differences to C04



X-Pole: Differences to C04



Conclusions

- ➔ CONT02 is well-suited for combination studies:
Many common parameters for VLBI and GPS (coordinates of 8 stations, tropospheric parameters, EOPs)
- ➔ All parameters benefit from a combination
- ➔ EOPs and troposphere parameters (ZD and gradients) can be used to identify problems in the local tie information
- ➔ Combination of troposphere ZD as alternative to the direct combination of station heights, however, it cannot fully replace a good local tie in height
- ➔ Some biases in local ties and tropospheric parameters remain unexplained
- ➔ Higher temporal resolution for ERPs and troposphere ZD does not degrade the solution
- ➔ UT1/nutation offsets (VLBI) can successfully be combined with LOD/nutation rates (GPS)