

18 YEAR OF QC ANALYSIS
AT
DELFT UNIVERSITY OF TECHNOLOGY

R. Noomen

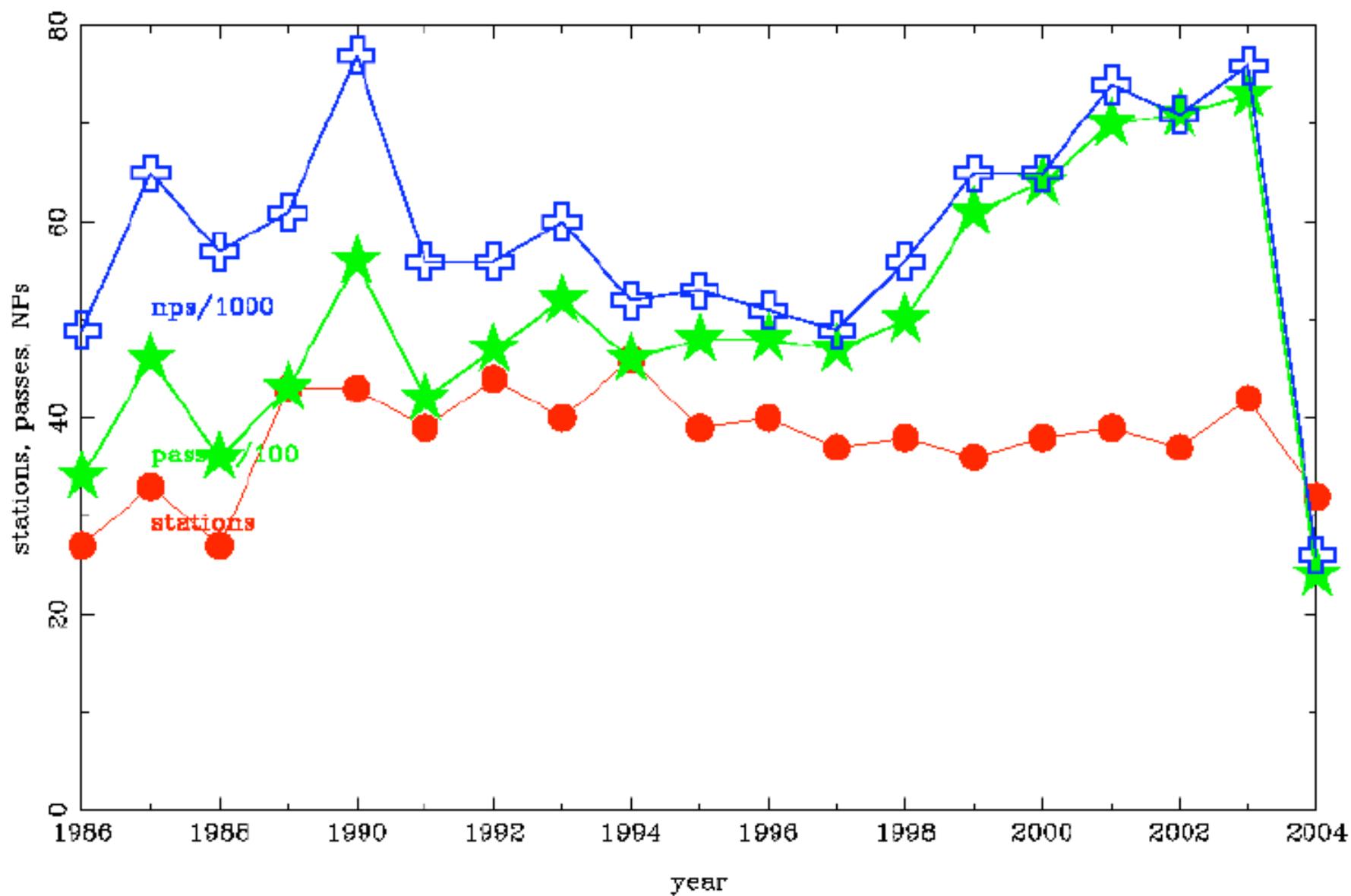
IWLR2004, San Fernando, June 9, 2004

Acknowledgements: Boudewijn Ambrosius, Dagmar Bock, Wim van Gaalen, Ernst Hesper, Hans Leenman, Robert de Muynck, Gert-Jan Ourensma, Wim Simons and Karel Wakker

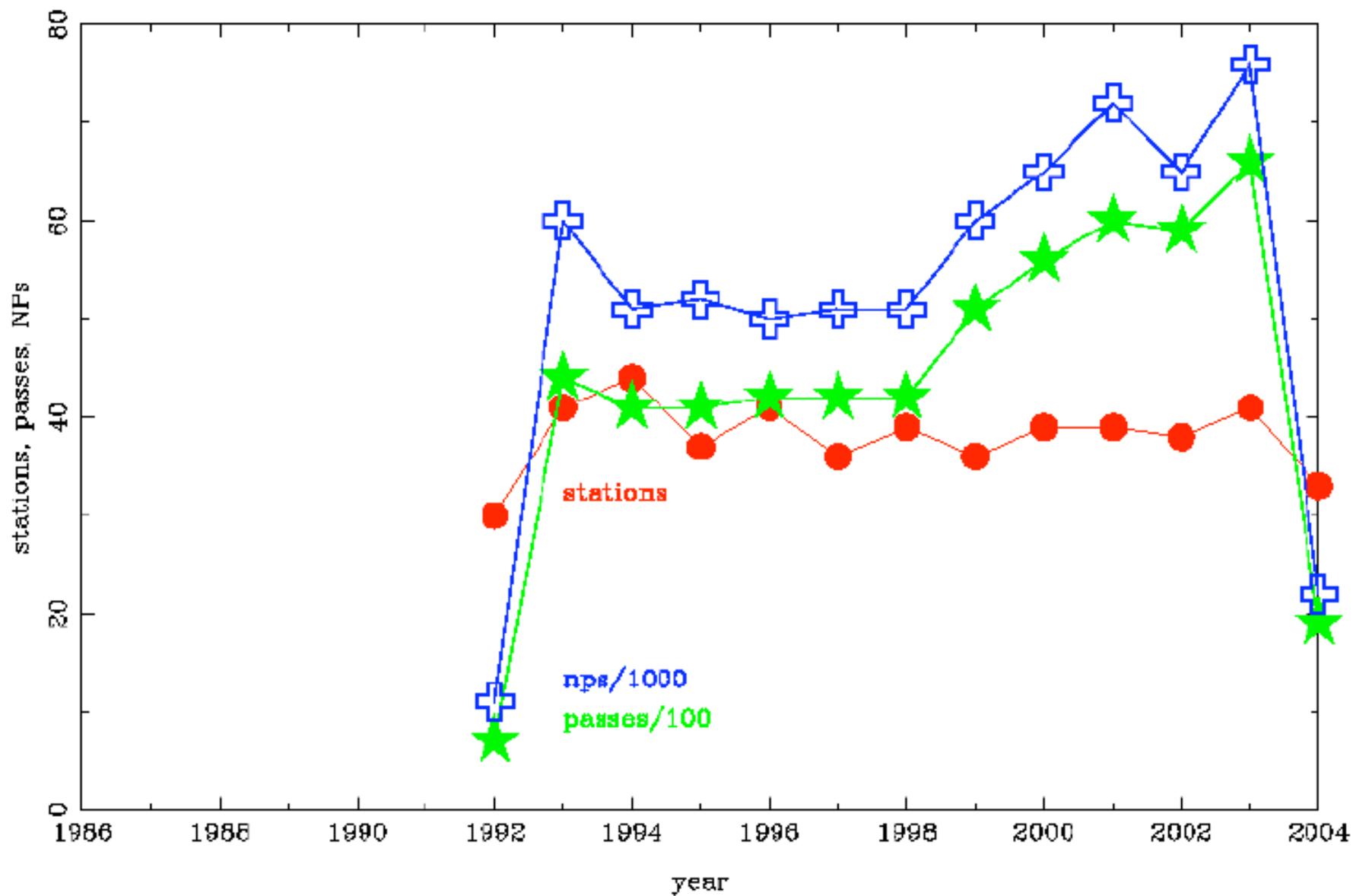
Quick-Look Data Analysis Center (QLDAC)

- Support of WEGENER/MEDLAS
- Semi real-time EOPs
- Semi real-time global network QC

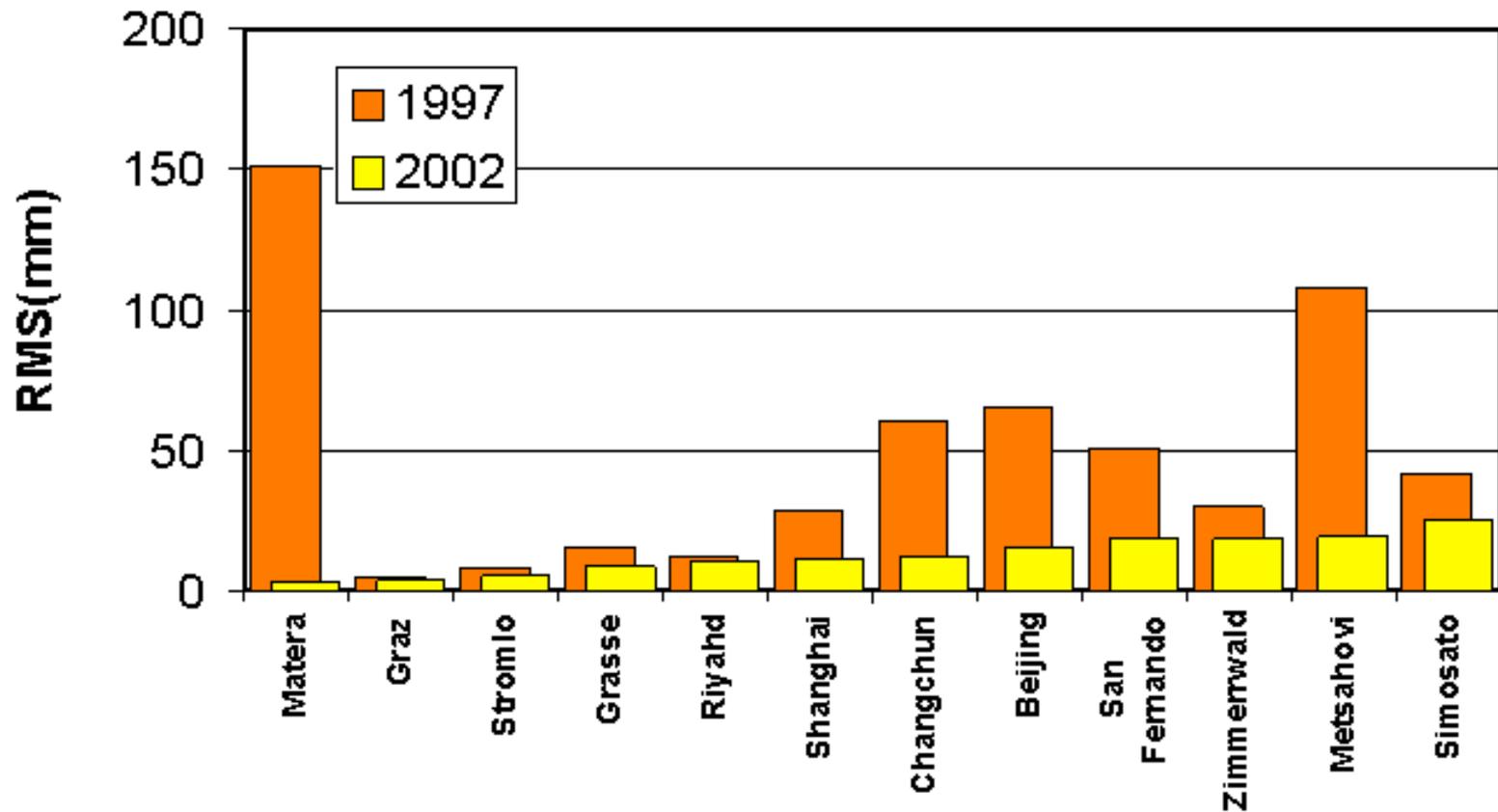
LAGEOS-1



LAGEOS-2



Improvements – Precision (Single Shot RMS)

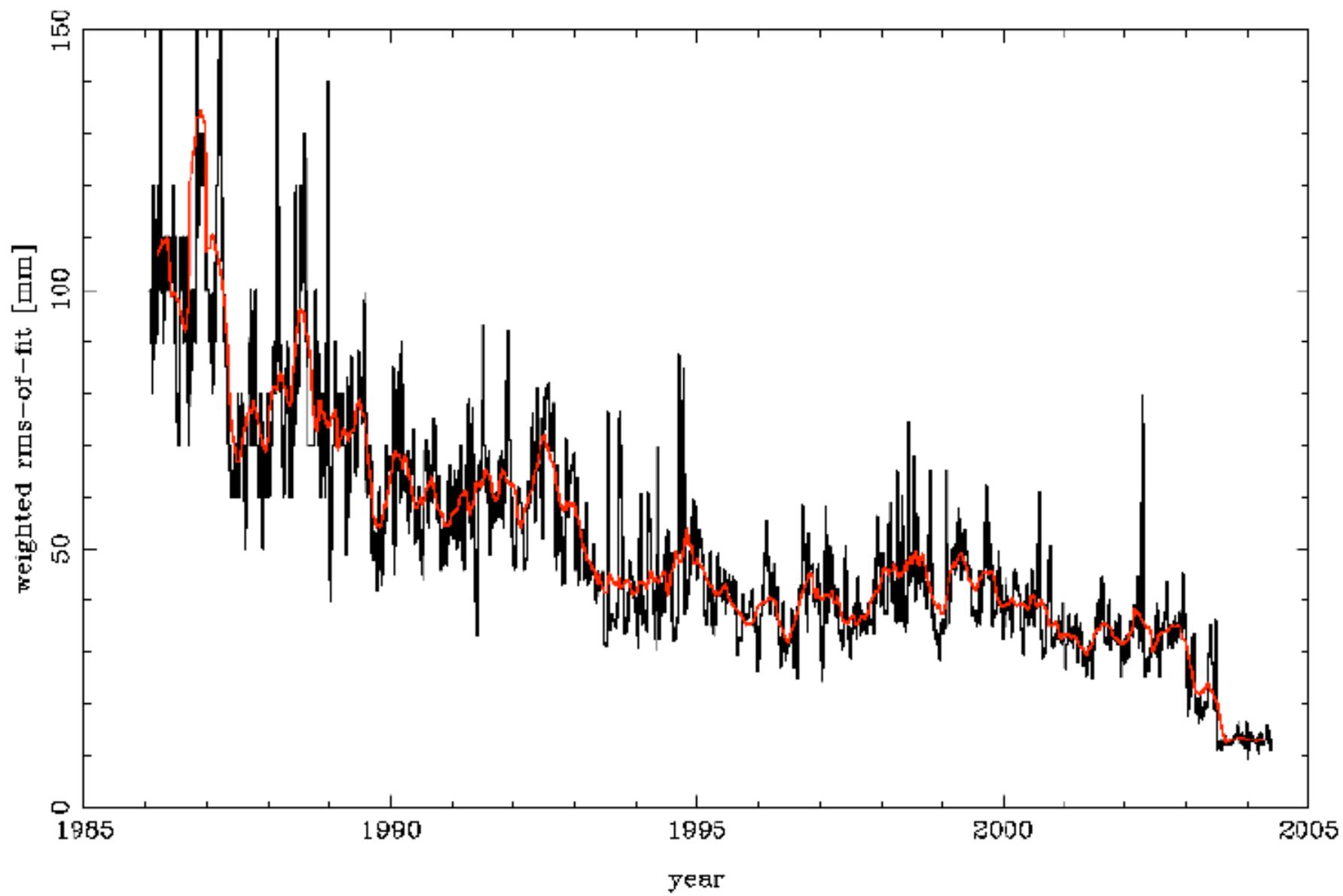


WEGENER/MEDLAS

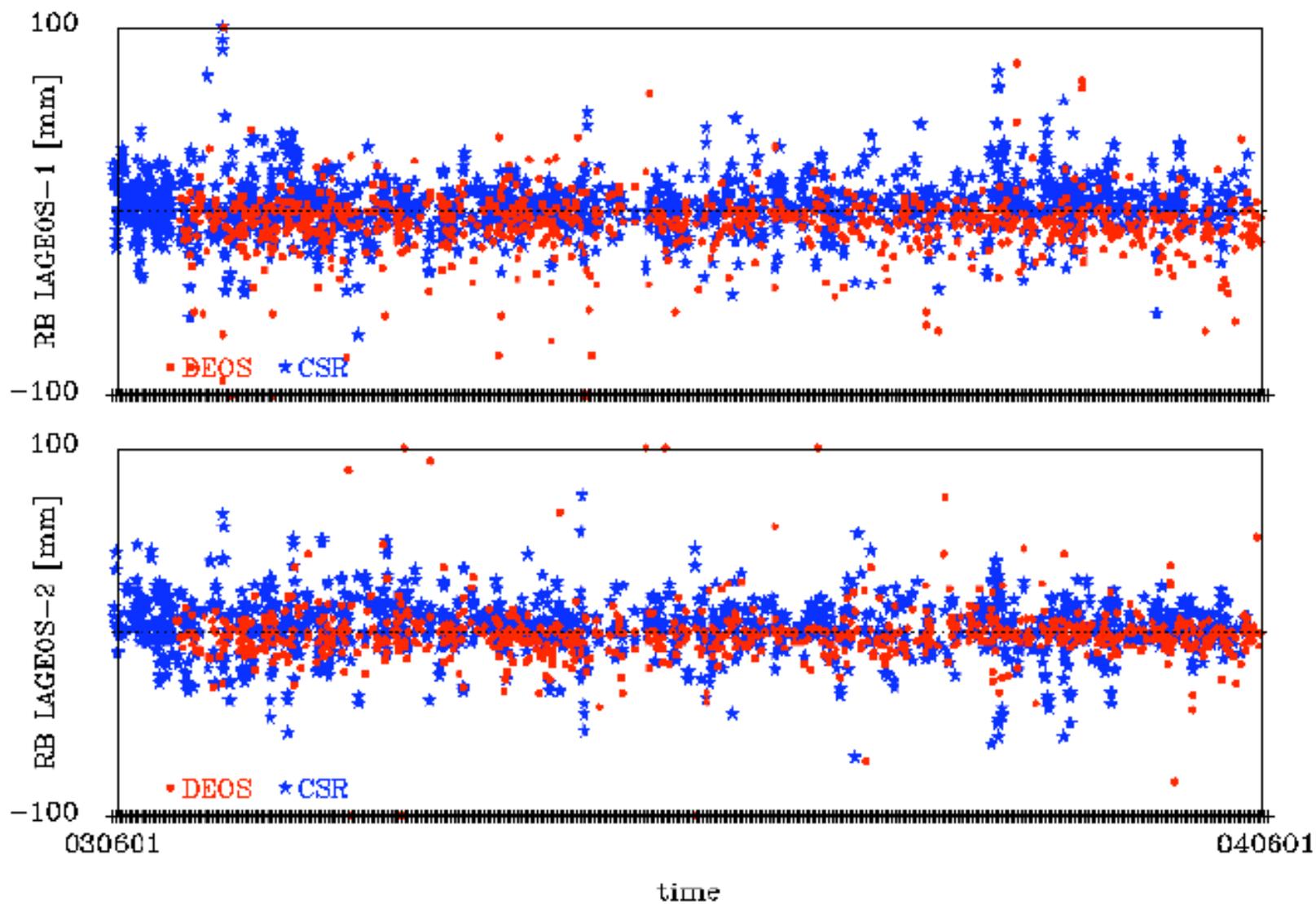
- determine crustal deformations in Mediterranean area
- MTLRS-1, MTLRS-2, TLRS-1
- 4 observation campaigns: 1986, 1987, 1989 and 1992
- Delft University:
 - MTLRS-2
 - QC + number of passes
 - science

OVERVIEW OF MAJOR DEVELOPMENTS IN QLDAC PROCESSING

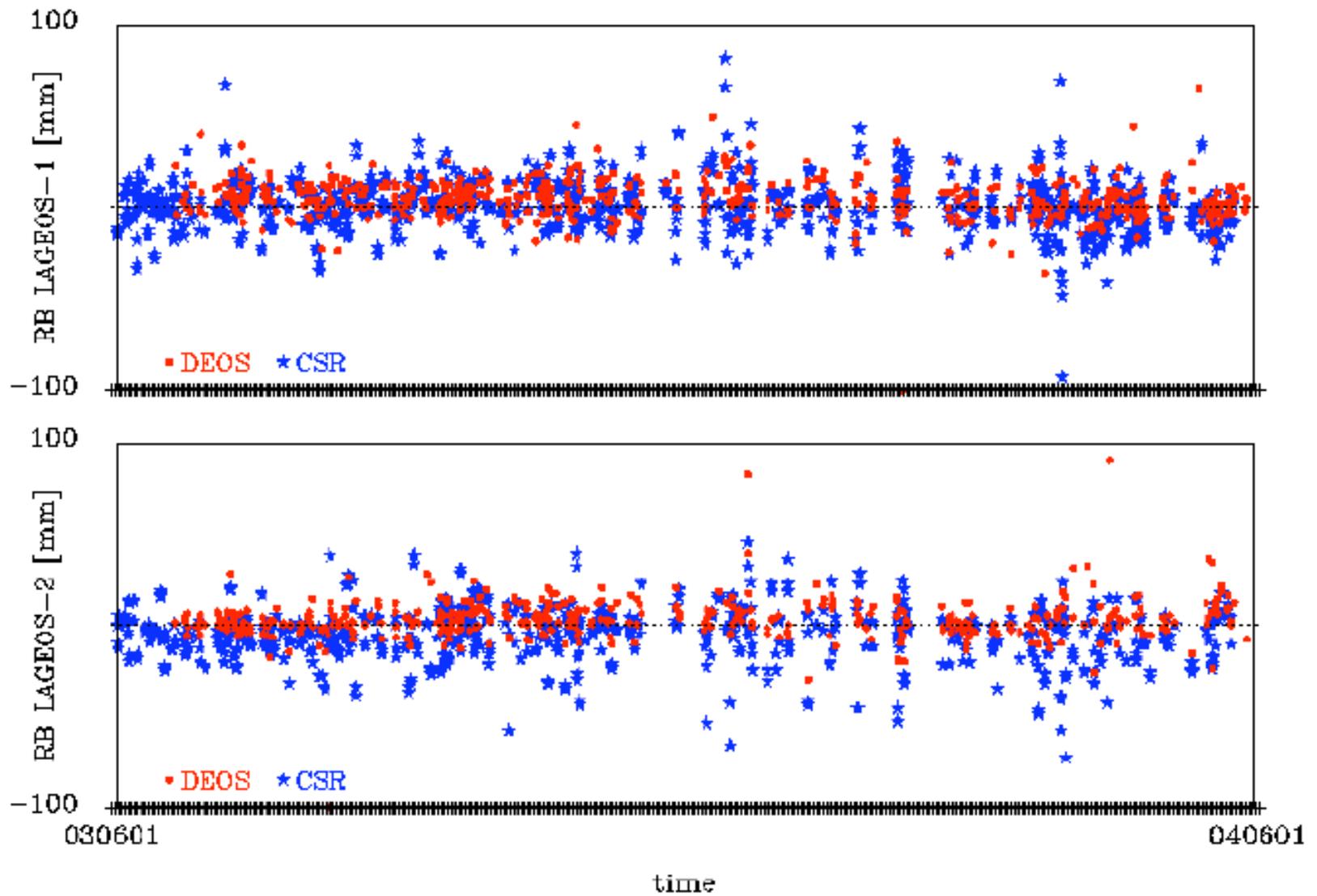
date	model element	strategy
Jan 1986	<i>initial settings</i>	<i>initial settings</i>
May 1987	DUT/SOM 87.1 station coordinates Wahr solid earth tides Schwiderski ocean tides	
April 1989	GEM-T1 gravity and tides DUT/SOM 89.3 station coordinates	
July 1991	GEM-T2 gravity and tides DUT/SOM ERS90 station coordinates	data weight rss 50 mm + station noise
Oct 1992	LAGEOS-2 251 mm c.o.m., offset	1-cpr radial accelerations estim.
Jan 1994	JGM-2 gravity and tides DUT/SOM 93L05 station coordinates	data weight rss 30 mm + station noise 3-day EOPs estimated
Jan 2003	EGM96 gravity and tides ITRF2000 station coordinates zero degree elevation cut-off	1-cpr cross-track accelerations estim. data weight rss 15 mm + station noise full automation
July 2003	ocean loading atmospheric pressure loading	1-day EOPs estimated geocenter estimated estimation of 1-cpr terms twice per arc



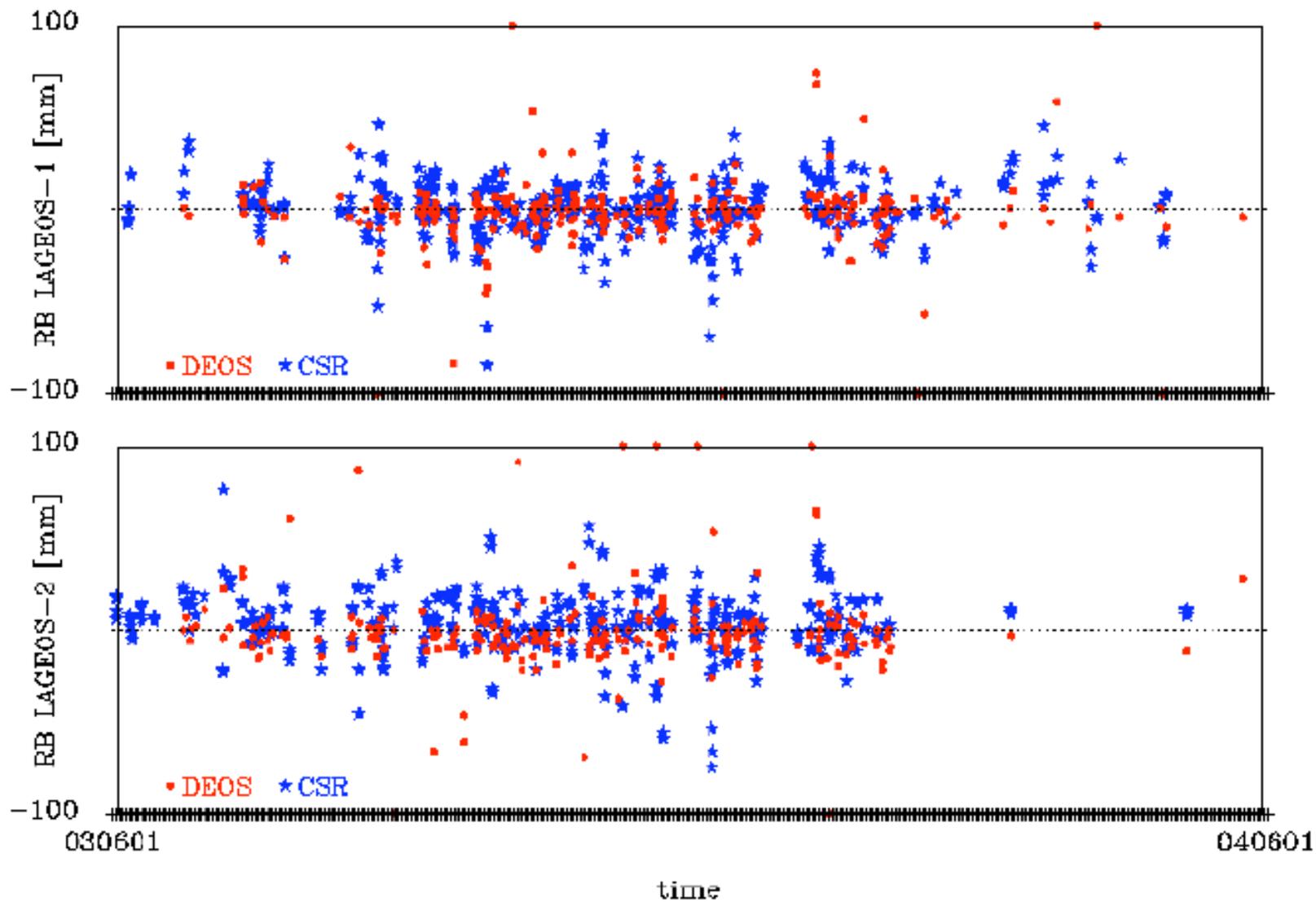
station 7090 (Yarragadee)



station 7840 (Herstmonceux)

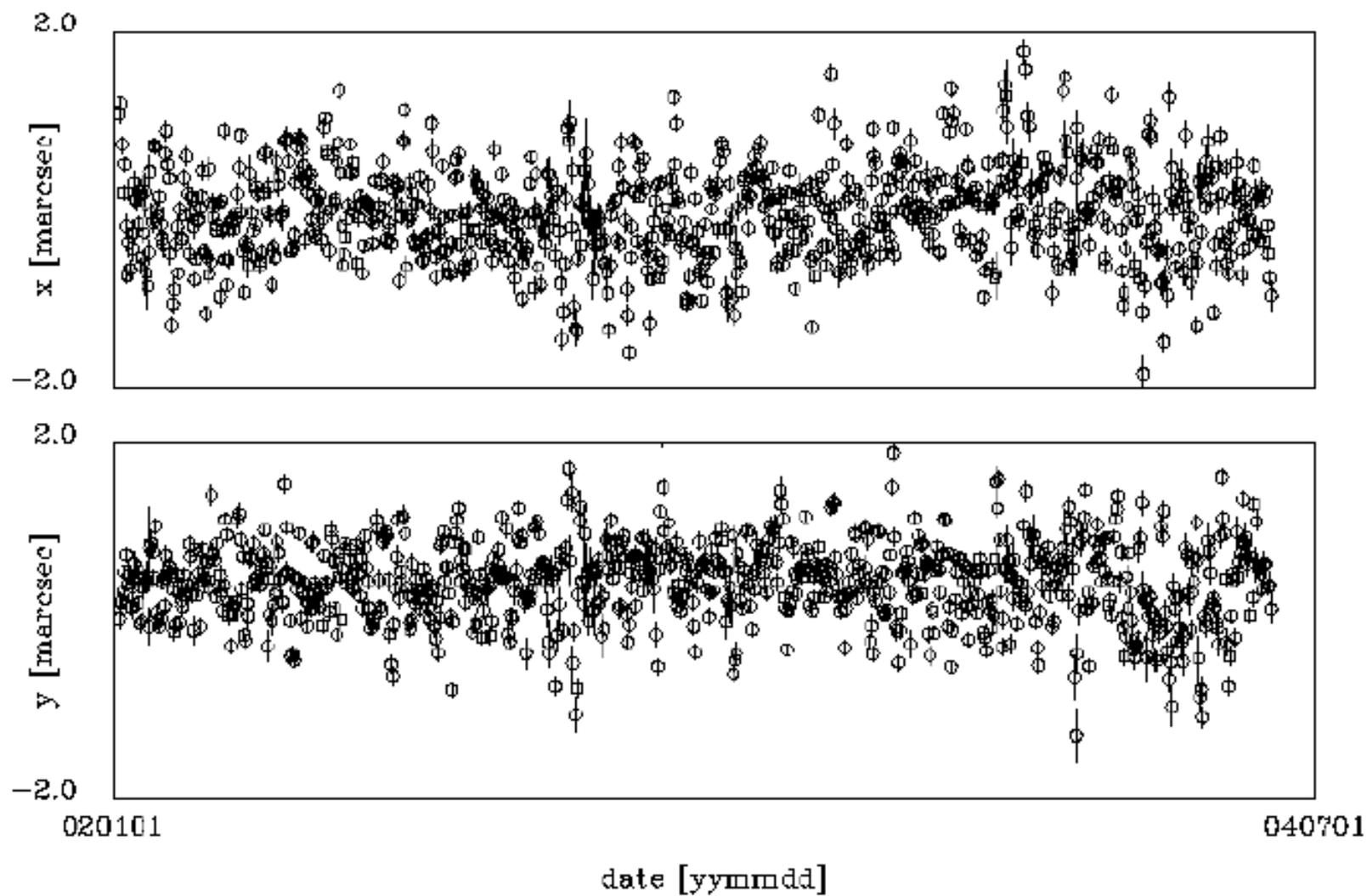


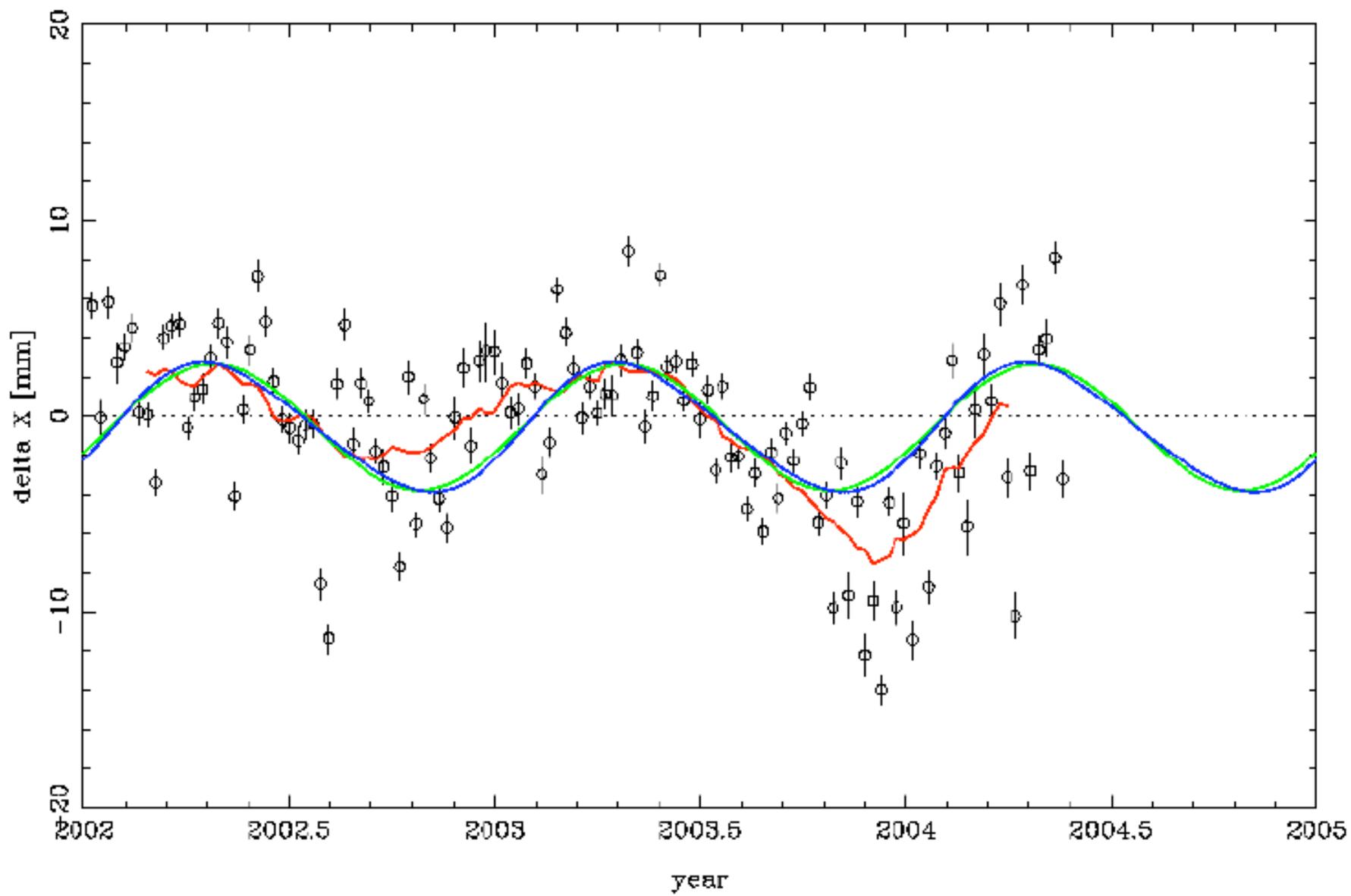
station 7105 (Greenbelt)

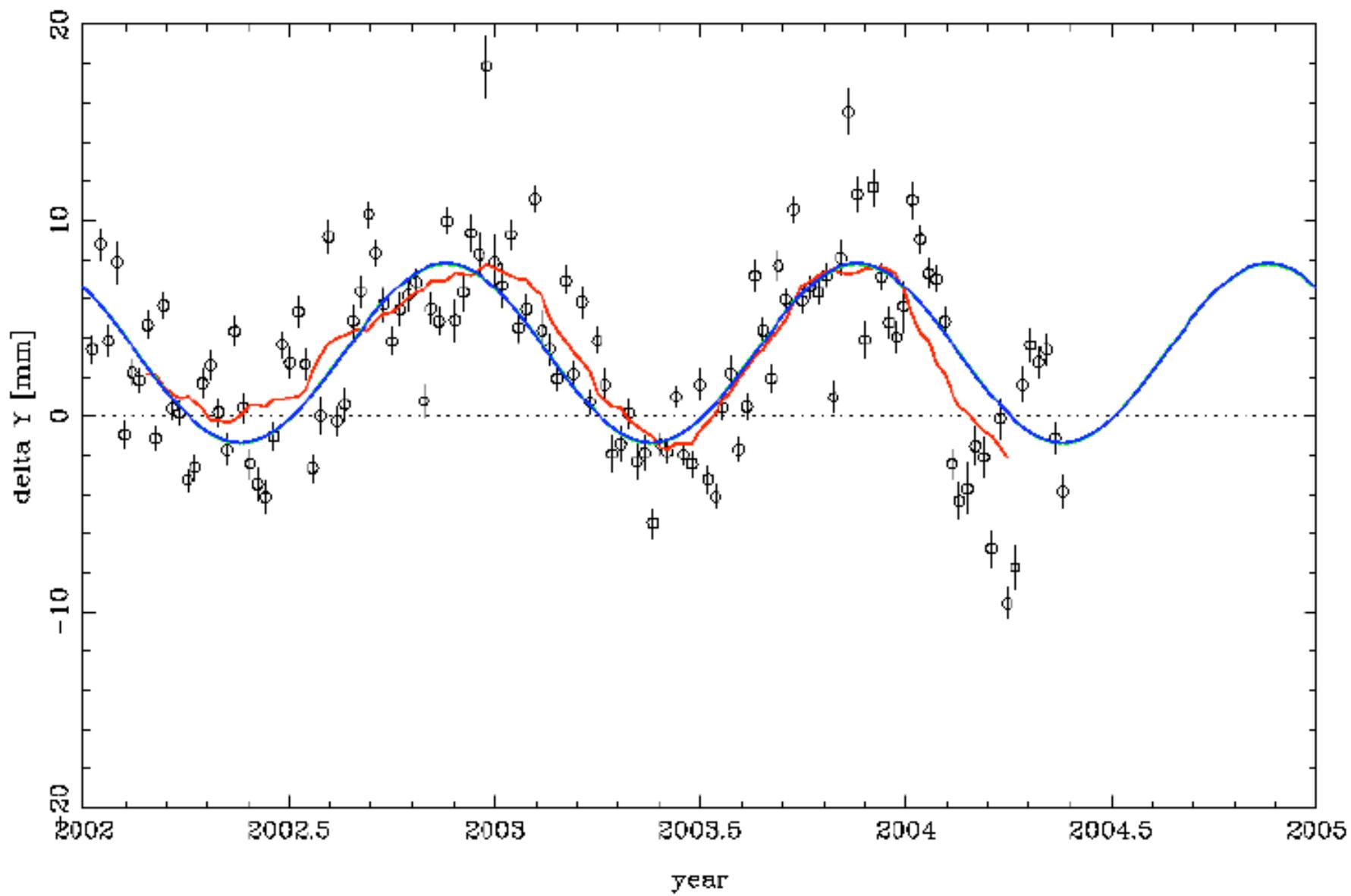


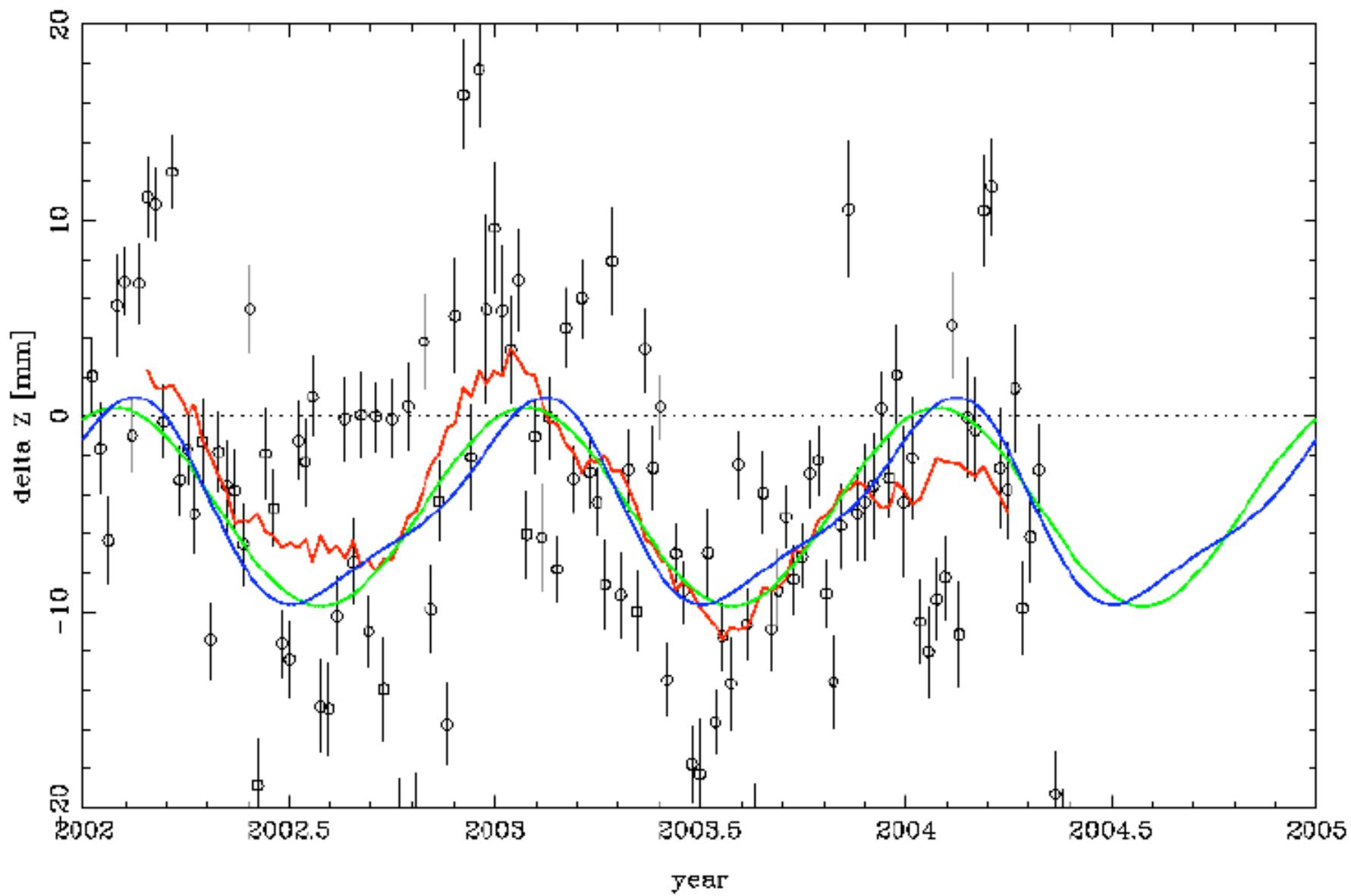
	date	satellite	range bias [mm]		
			QLDAC	CSR	
7231	July 26	15:15	LAGEOS-2	1331 ± 275	1331
7838	July 31	09:48	LAGEOS-2	-153 ± 50	-143
7838	August 4	10:13	LAGEOS-2	-109 ± 50	-114
7838	August 5	06:53	LAGEOS-1	-138 ± 32	-135
7237	August 13	19:01	LAGEOS-1	-1001 ± 44	-996
7838	August 22	12:21	LAGEOS-2	-119 ± 36	-124
7810	August 23	00:45	LAGEOS-1	832 ± 55	810
7810	August 23	04:13	LAGEOS-1	878 ± 42	883
7838	August 23	10:47	LAGEOS-2	-123 ± 43	-124
7838	August 23	14:41	LAGEOS-2	-156 ± 52	-181
7838	September 17	11:25	LAGEOS-2	-150 ± 27	-146
8834	September 18	08:37	LAGEOS-2	277 ± 12	292
7838	September 18	09:29	LAGEOS-2	-134 ± 22	-128
8834	September 18	11:08	LAGEOS-1	270 ± 20	298
7838	September 19	03:29	LAGEOS-2	-176 ± 31	-144
7845	September 19	10:53	LAGEOS-2	1196 ± 43	36
7231	September 23	12:09	LAGEOS-2	1306 ± 63	1307
7941	December 6	02:03	LAGEOS-1	1899 ± 21	1895
6405	December 19	03:27	LAGEOS-1	933 ± 72	989
7237	February 15	12:07	LAGEOS-1	993 ± 54	1002
7237	March 4	10:33	LAGEOS-2	952 ± 439	937
7237	March 8	10:26	LAGEOS-1	-1140 ± 77	-1118
7237	March 8	14:53	LAGEOS-2	-1116 ± 57	-1149
7237	March 11	17:13	LAGEOS-2	974 ± 77	990
1884	March 12	18:37	LAGEOS-2	-222 ± 149	-178
1884	March 12	19:27	LAGEOS-1	-312 ± 109	-252
1884	March 12	22:48	LAGEOS-1	165 ± 79	182
7237	April 7	18:25	LAGEOS-1	990 ± 33	990
7845	April 7	21:23	LAGEOS-2	-1199 ± 14	-8
7845	April 7	22:35	LAGEOS-1	-1217 ± 15	-30
7237	April 9	12:49	LAGEOS-1	1003 ± 174	982
7237	April 10	12:43	LAGEOS-2	1009 ± 184	992
7941	May 21	19:13	LAGEOS-1	1861 ± 13	1867

Table 1: Overview of the major data problems of the global network of SLR stations, as found in the period June 2003 - June 2004 by QLDAC and CSR.

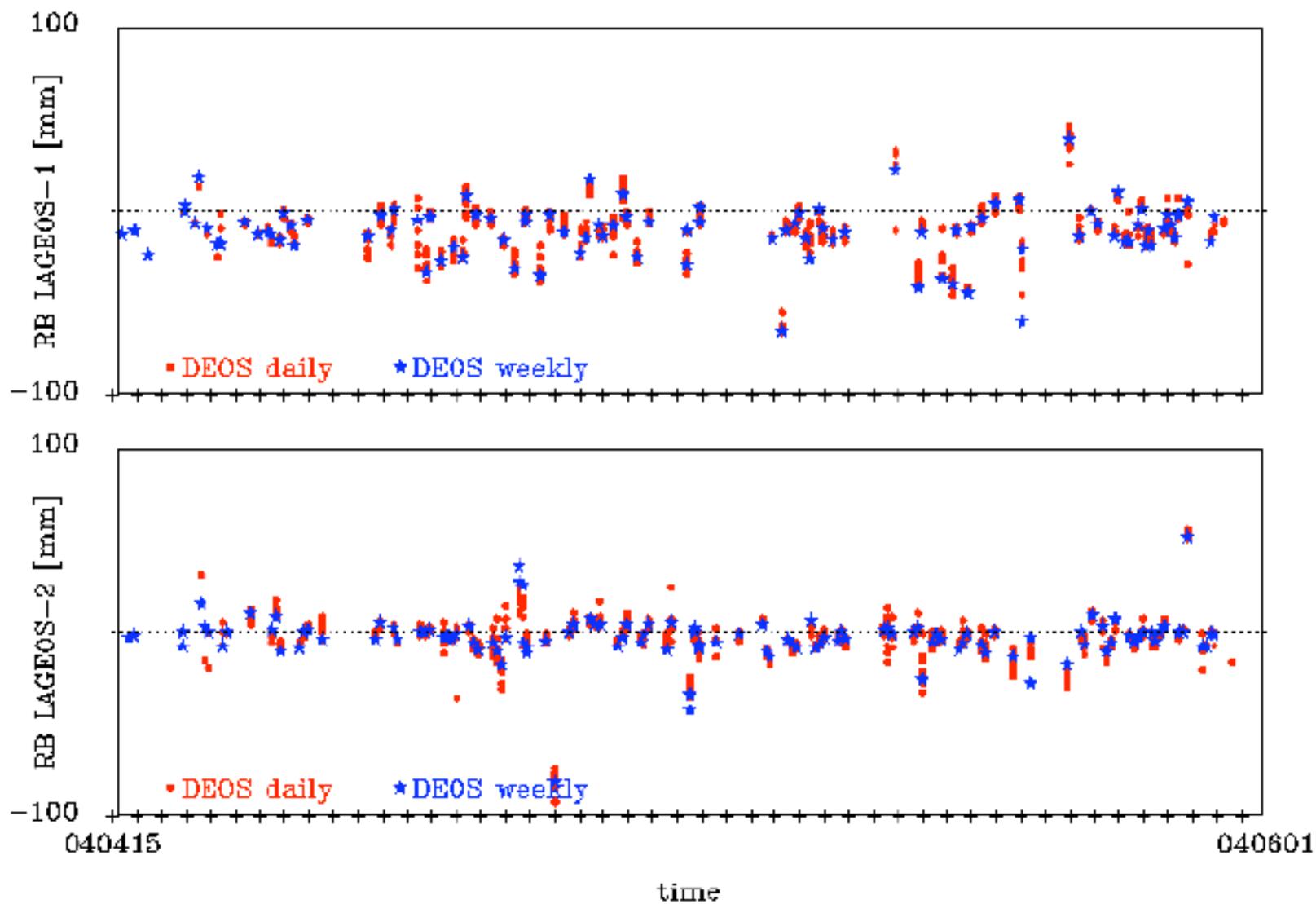








station 7090 (Yarragadee)



QC ANALYSES:

- weekly:
 - every Tuesday
 - 8-day arcs
 - average delay $0.5*8+2 = 6$ days
- daily:
 - every day
 - 8-day arcs
 - average delay $0.5+0.5 = 1$ day

SUMMARY

- operational 18 years

- 3 main goals

currently global QC most important

- significant progress

e.g. fit 10-12 cm -> 10-15 mm

- new products

- frequency, time-delay

“TO DO” LIST

- Etalon
- tropospheric delay
- satellite/station signature
- empirical forces