

ILRSA CC

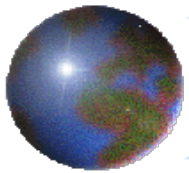
Status of the SP3 files combination



B.Pace, V. Luceri
eGEOS S.p.A., CGS – Matera

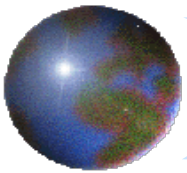


G. Bianco
Agenzia Spaziale Italiana, CGS - Matera



Contents

- SP3 data evaluation
- Preliminary combination
- Next steps

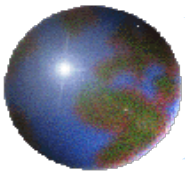


SP3 data evaluation

- L51/L52/L53/L54 SP3 files from 150620 to 150926 available at CDDIS
- cross-evaluate their consistency (RAC)
- preliminary combination

Assumptions

- EF frame as in the ACs weekly solution
- UTC
- SP3c format
- 2' POS/VEL L51/L52
- 15' POS/VEL L53/L54



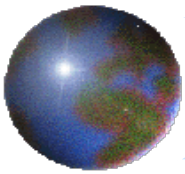
SP3 availability and assumptions adherence

AC	L51	L52	L53	L54
ASI	yes	yes	yes	yes
BKG	yes	yes	yes	yes
DGFI	yes	yes	-	-
ESA	yes	yes	yes	yes
GFZ	yes	yes	-	-
GRGS	NO	NO	NO	NO
JCET	yes	yes	yes	yes
NSGF	yes	yes	yes	yes

← Uploaded just 2 weeks ago

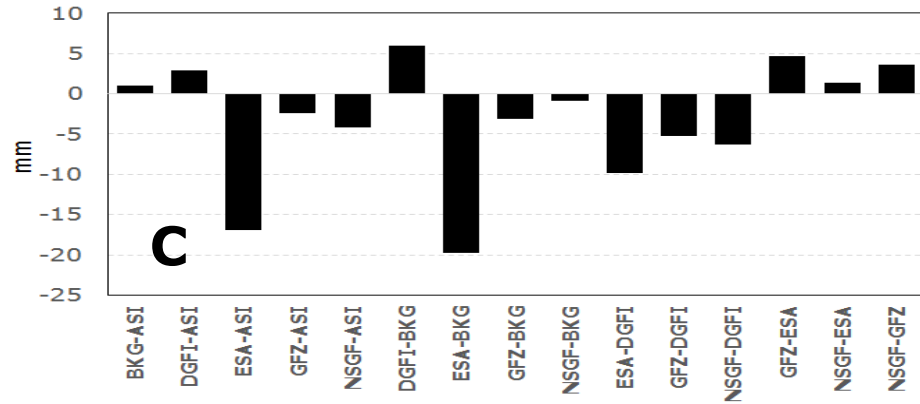
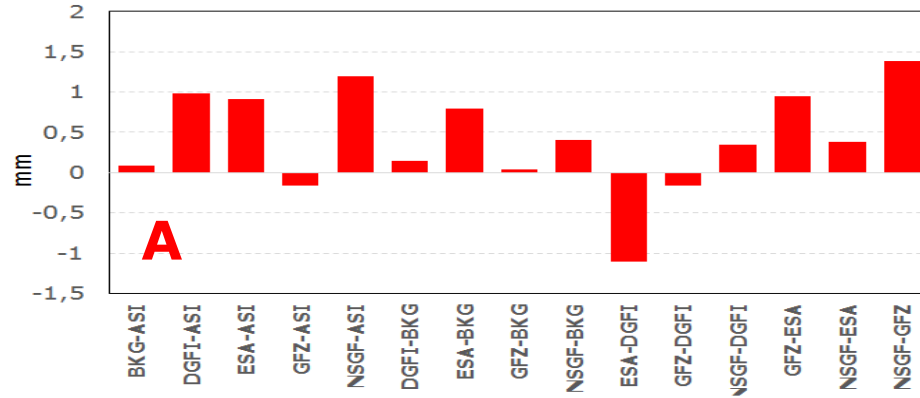
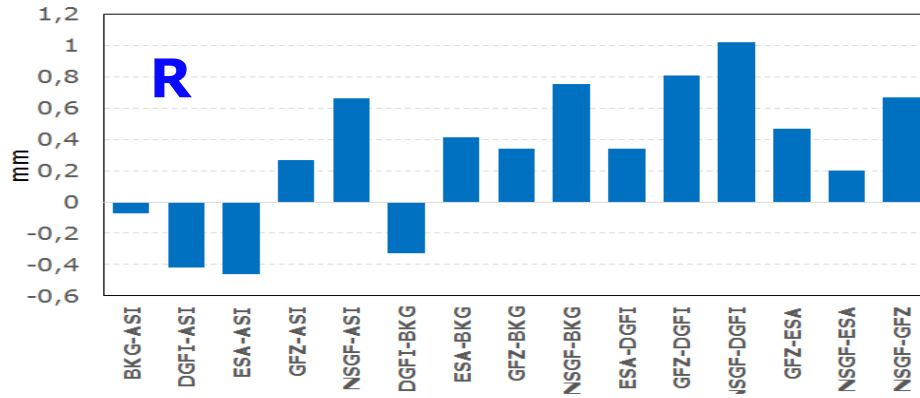
AC	Comments
DGFI	In LAGEOS1/2 sp3 files the “Number of Epochs” in the first line is 0.
BKG	In LAGEOS1/2 and ETALON1/2 sp3 files the name of Agency in the first line is CODE rather than BKG. Epoch incorrect from 150711 (second = 0.00000020)
ESA	- In LAGEOS1/2 and ETALON1/2 sp3 files the name of Agency in the first line is ESOC rather than ESA. - Format check NOK for L53/L54: the estimates are given every 5 min instead of 15 min.
NSGF	In LAGEOS1/2 and ETALON1/2 sp3 files the name of Agency in the first line is SGF rather than NSGF.

← OK

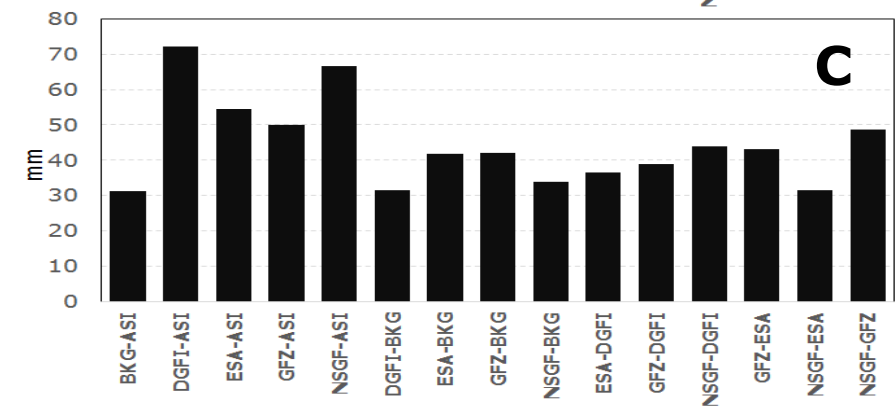
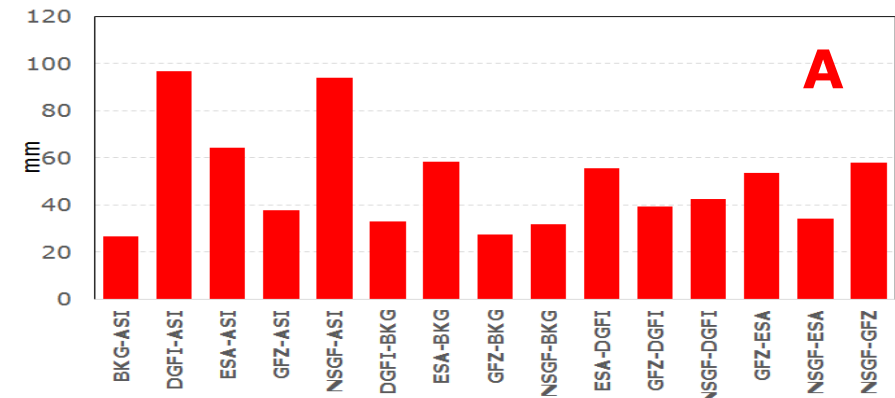
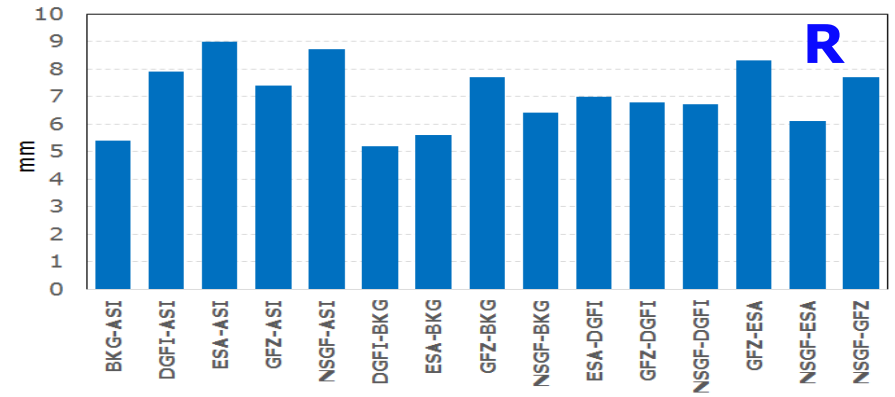


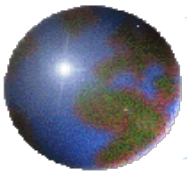
L51 – summary (150620-150926)

Mean



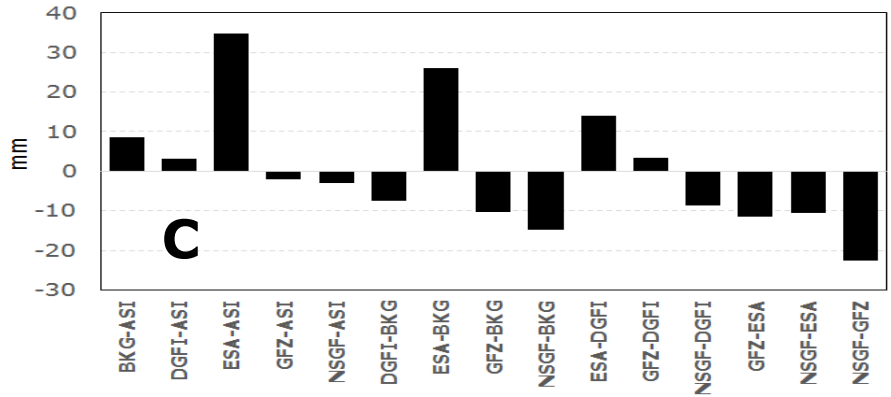
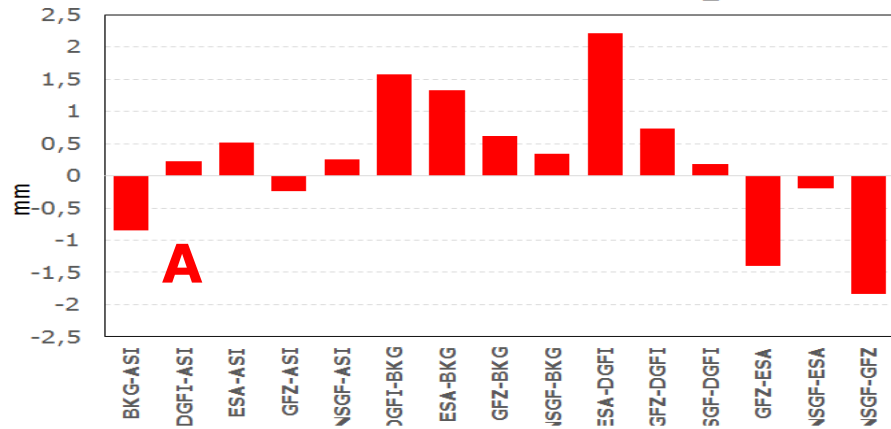
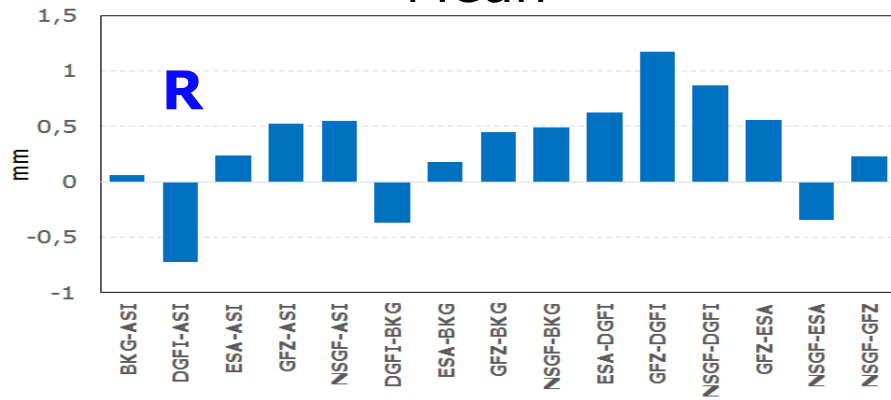
STD



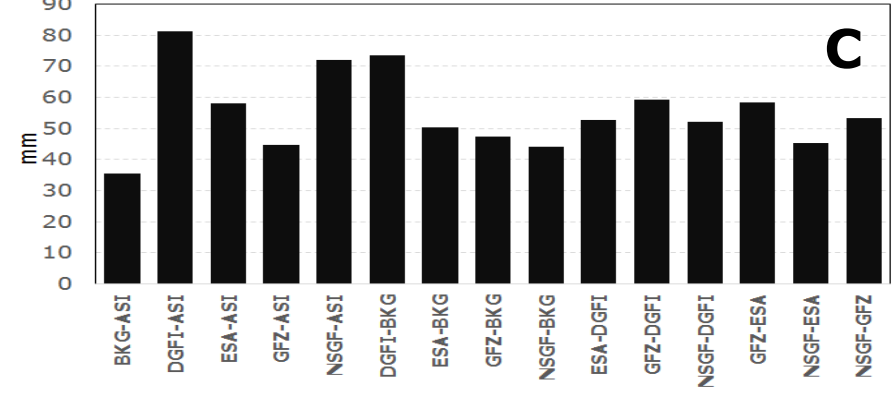
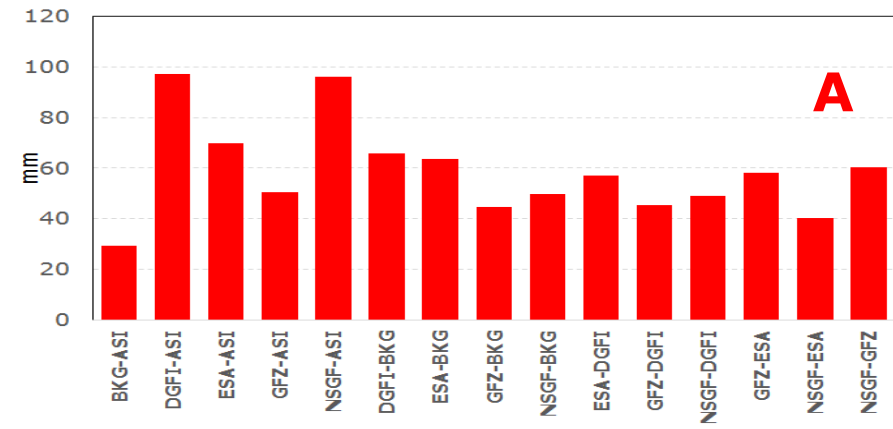
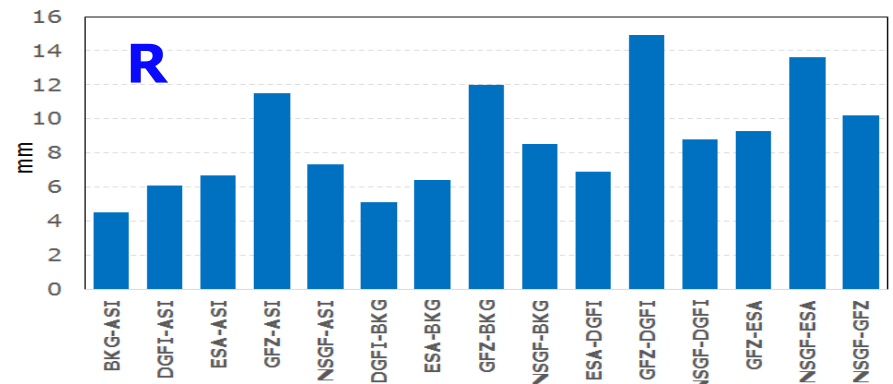


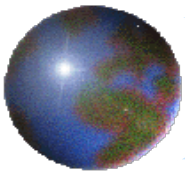
L52 – summary (150620-150926)

Mean



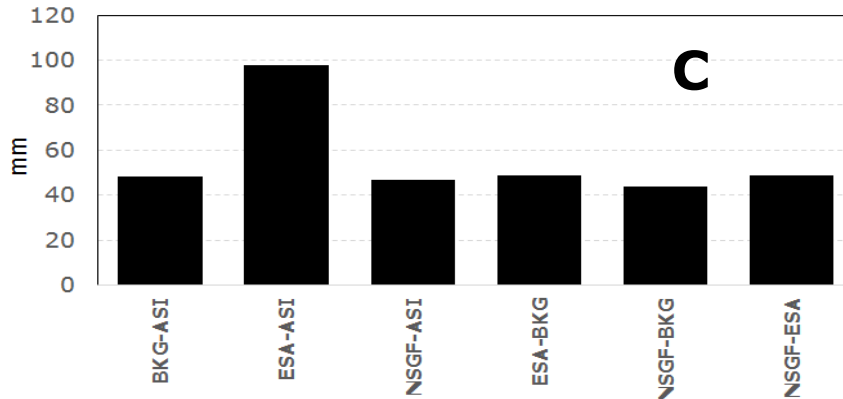
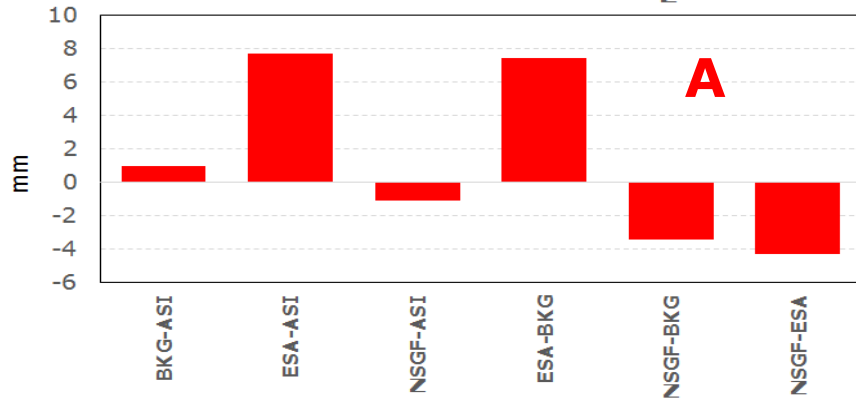
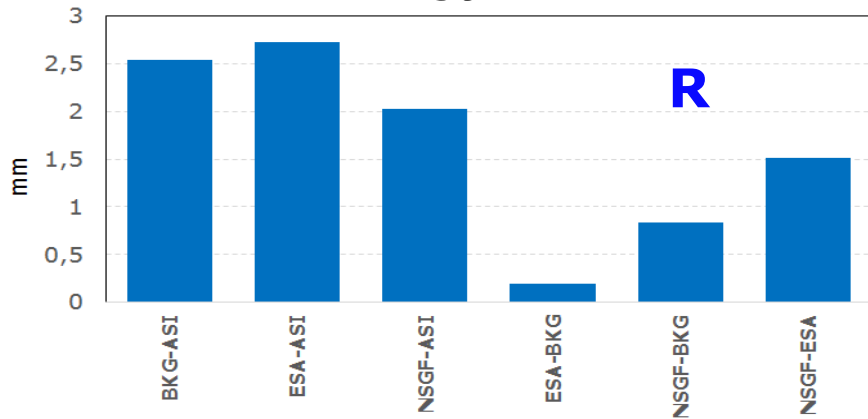
STD



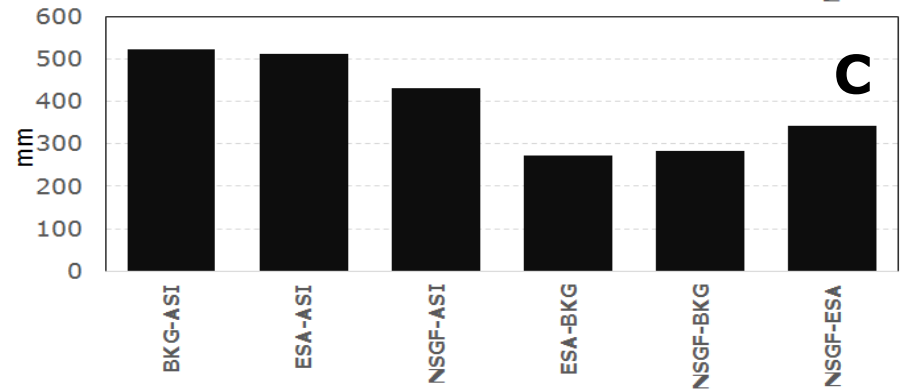
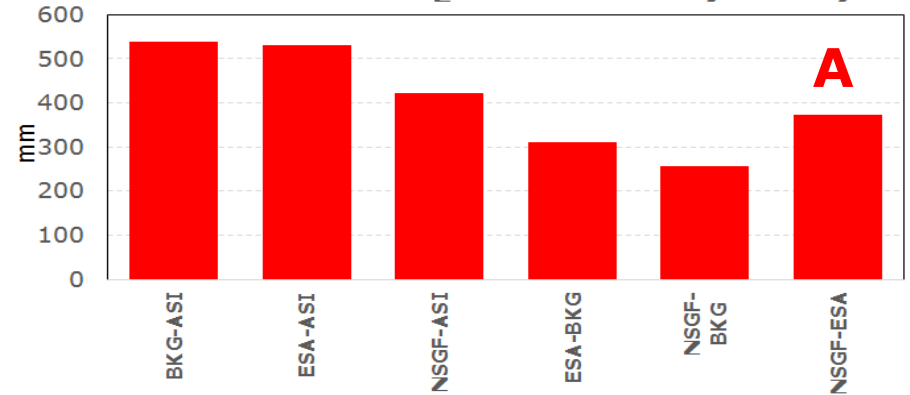
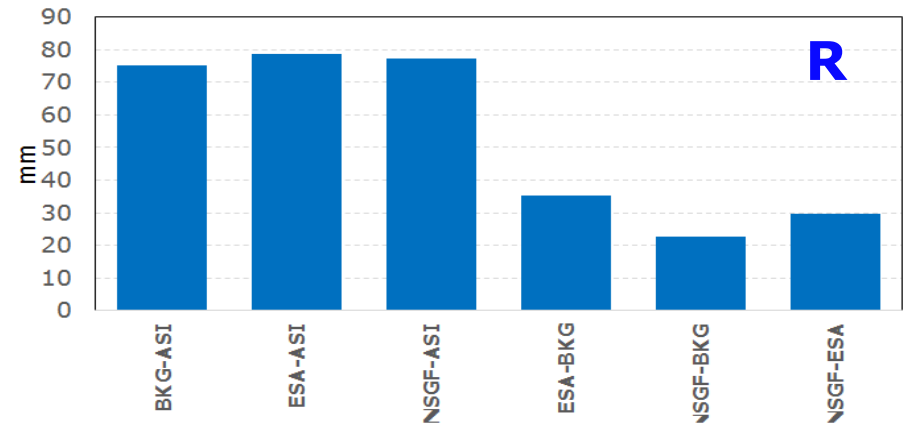


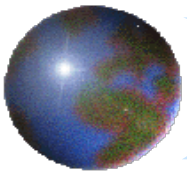
L53 – summary (150620-150926)

Mean



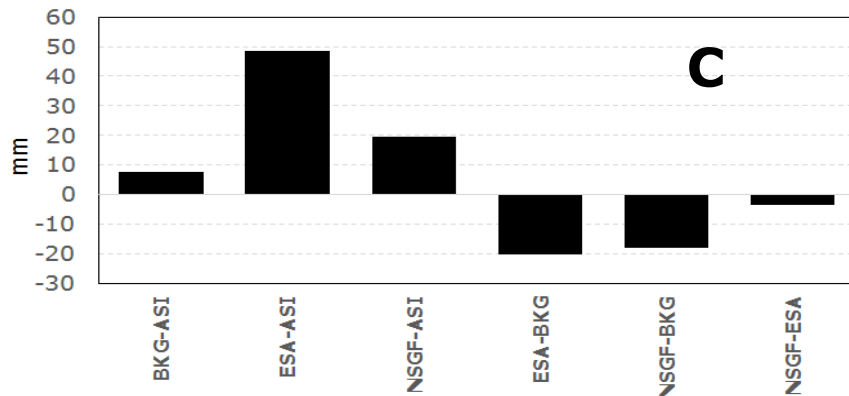
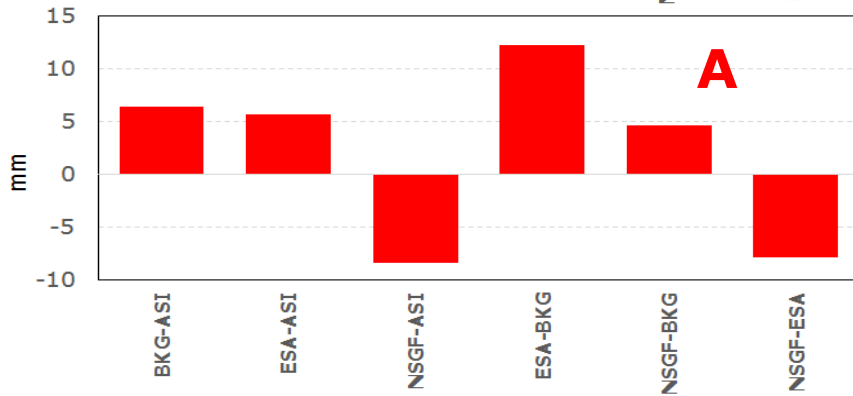
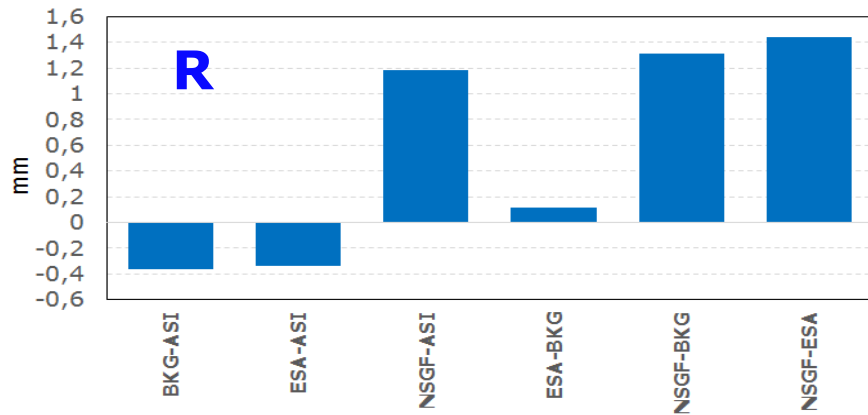
STD



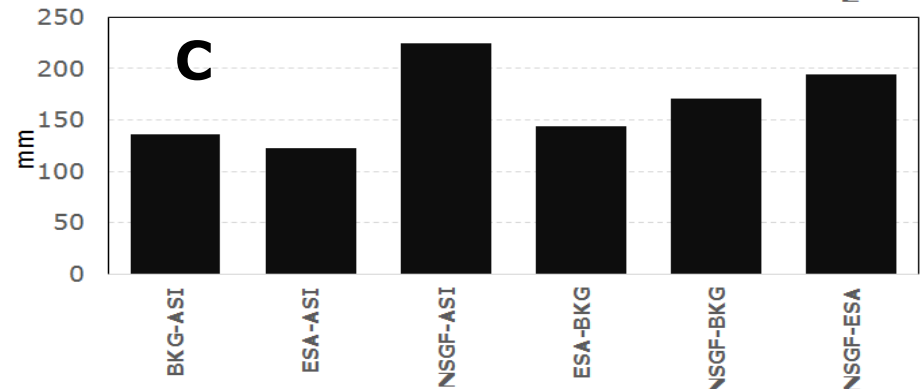
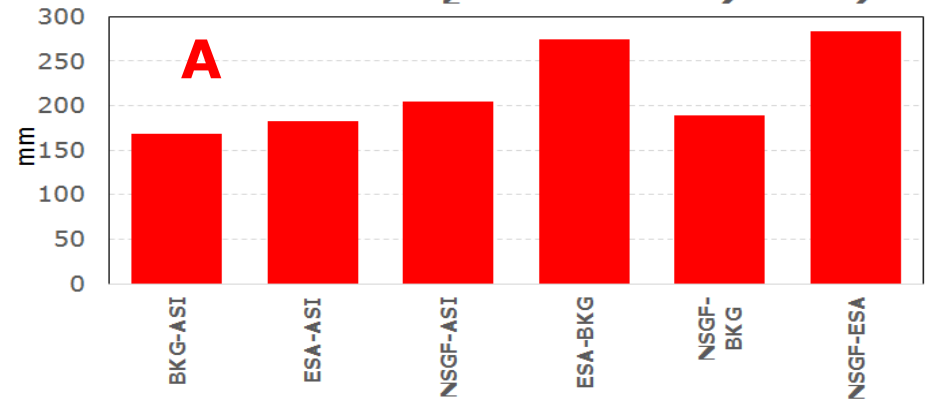
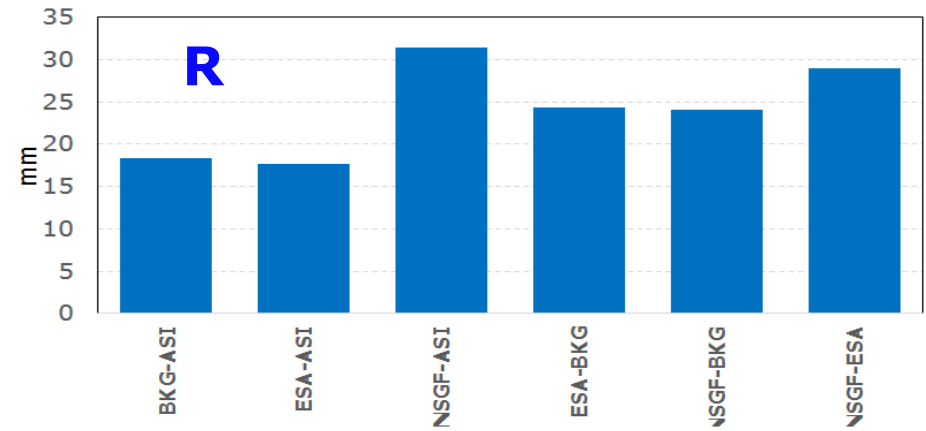


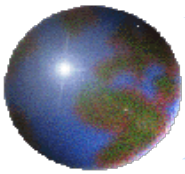
L54 – summary (150620-150926)

Mean



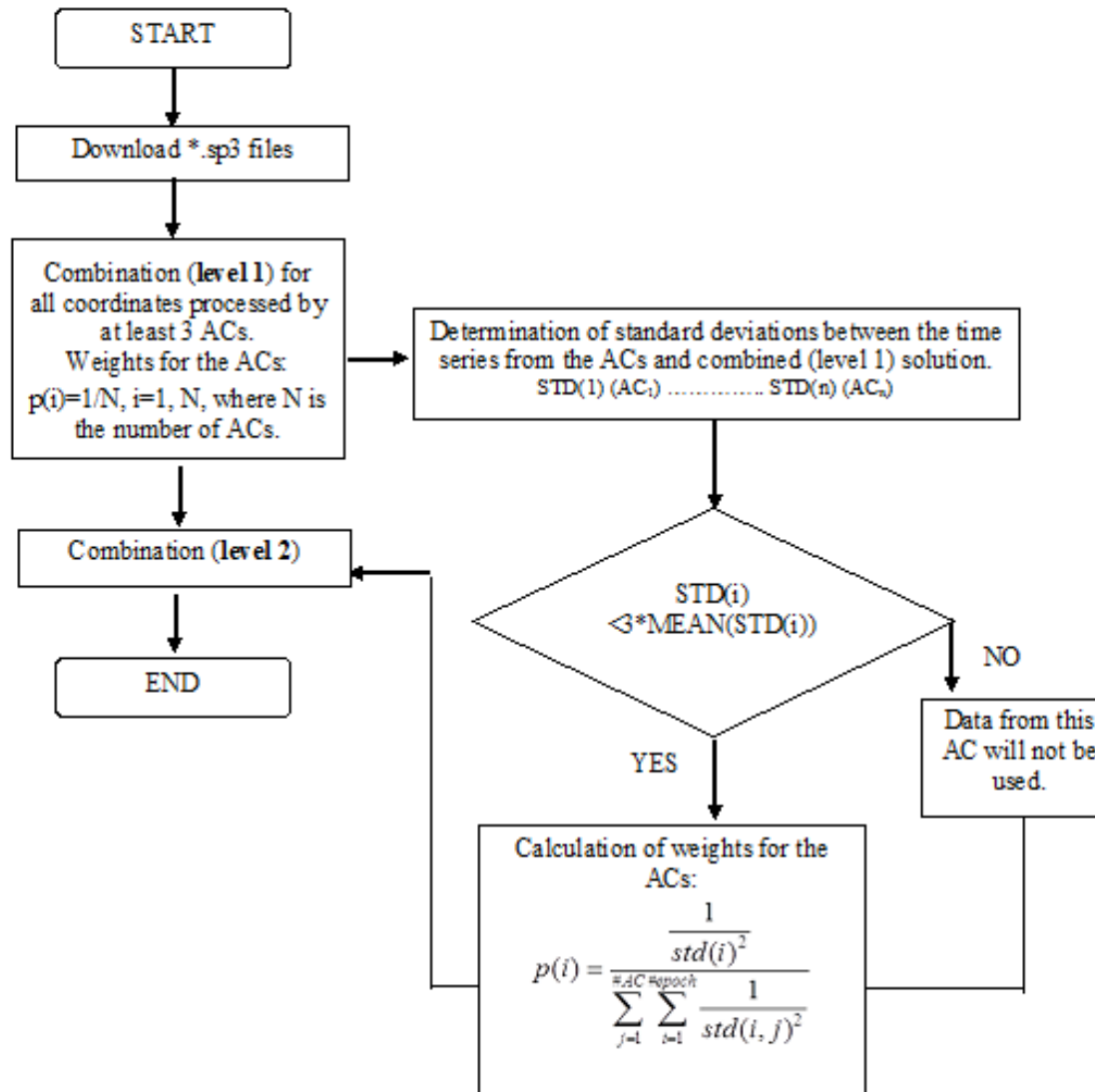
STD

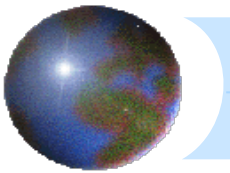




Combination strategy outline

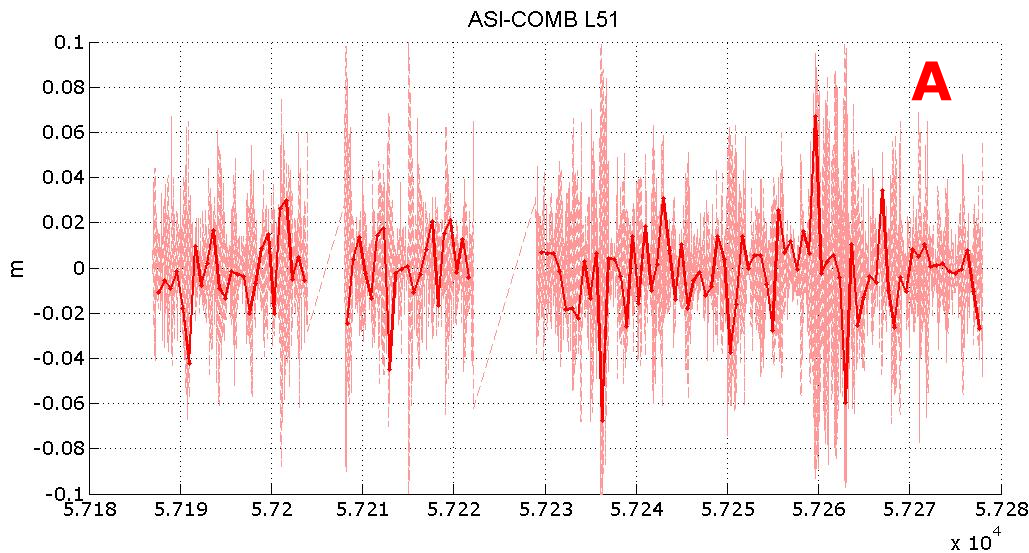
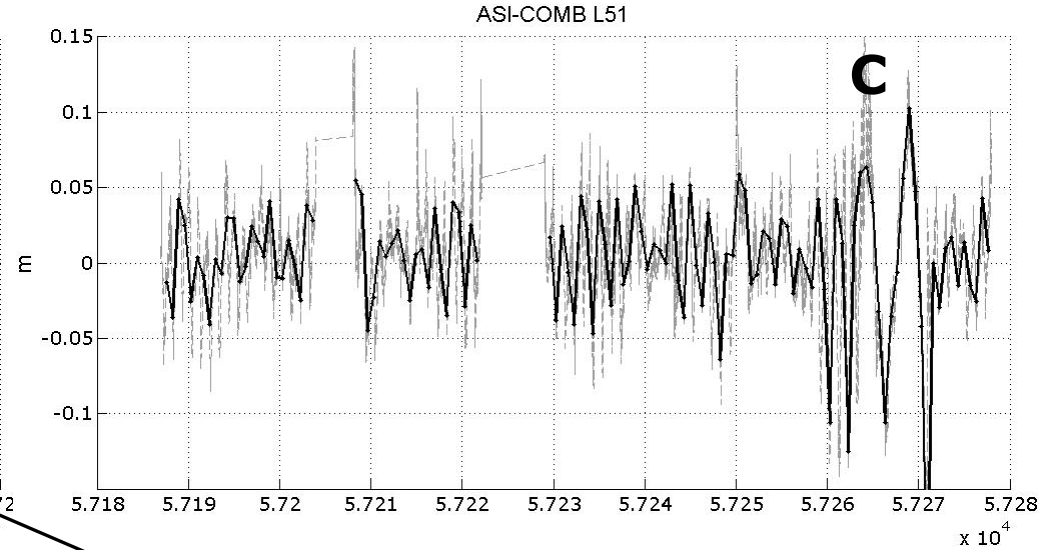
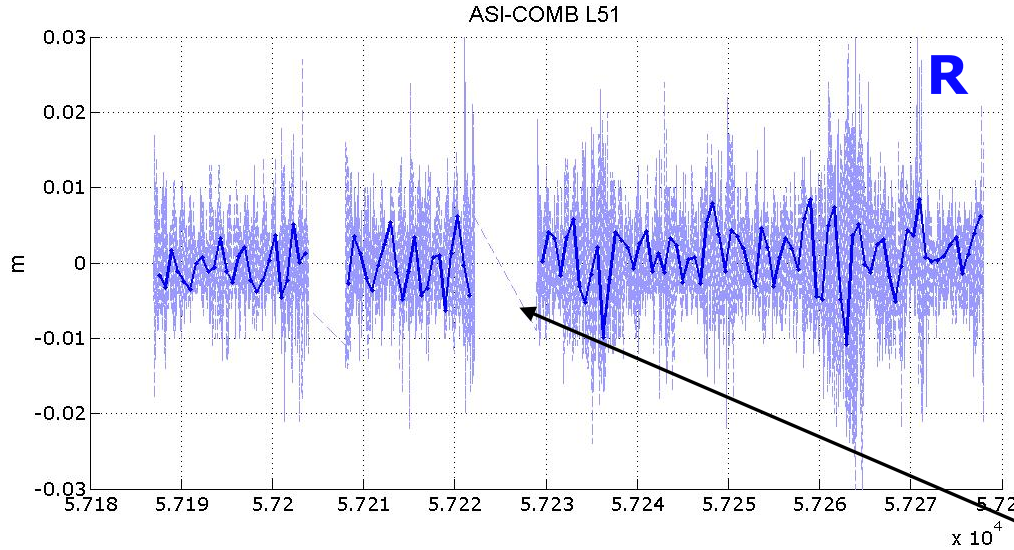
Assumption: each ILRS AC SP3 in AC weekly EF reference frame





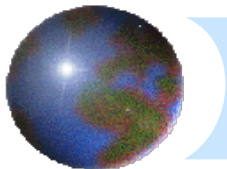
L51 ACs vs Combination

Test combination for L51 using **ASI**, BKG, DGFI, ESA, GFZ, NSGF



Gap to investigate

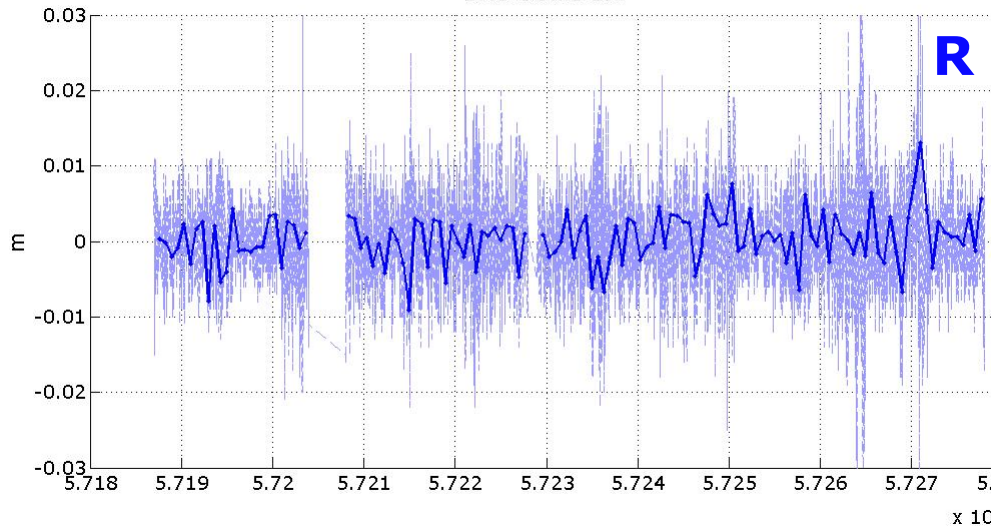
	MEAN [mm]	STD [mm]
R	0.2	5.8
A	-0.4	24.9
C	3.4	37.7



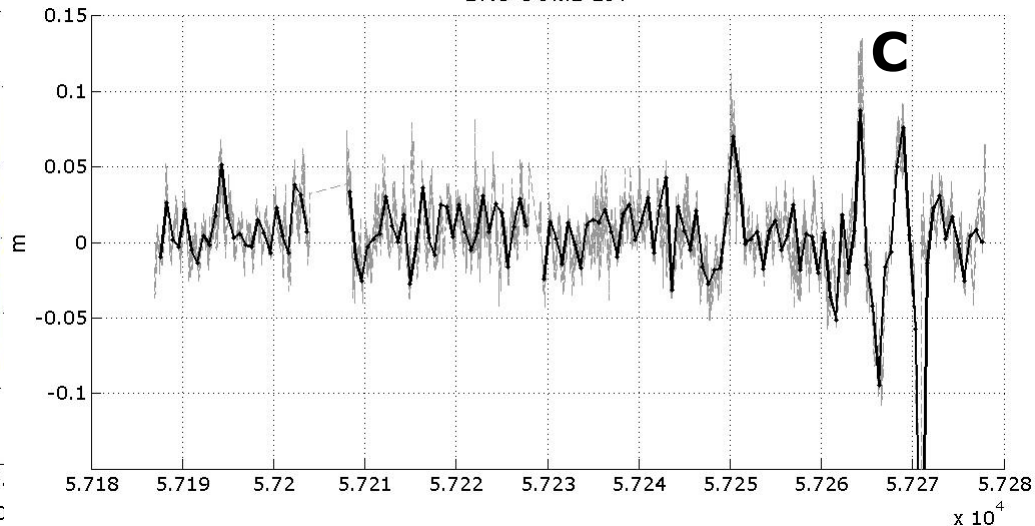
L51 ACs vs Combination

Test combination for L51 using ASI, **BKG**, DGFI, ESA, GFZ, NSGF

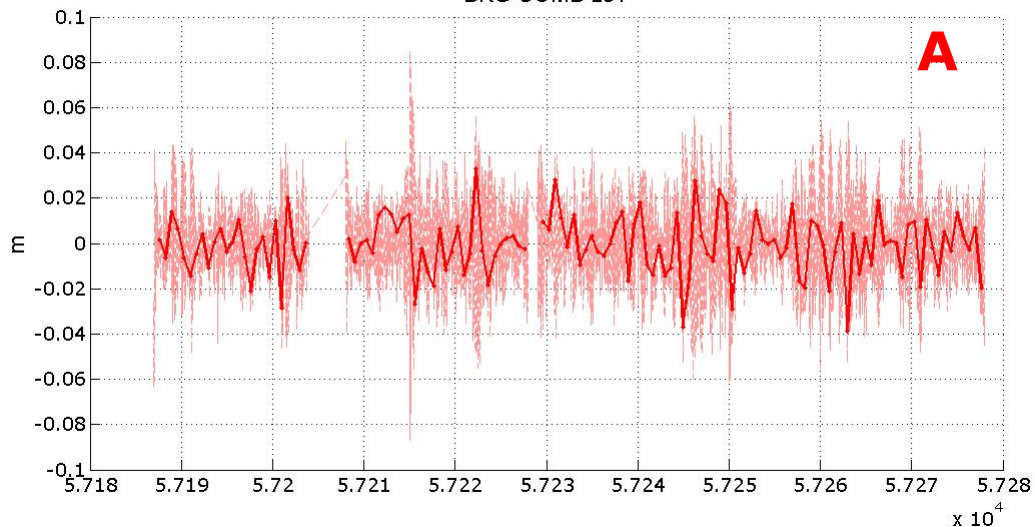
BKG-COMB L51



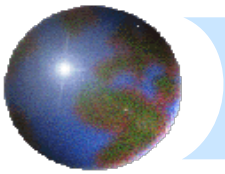
BKG-COMB L51



BKG-COMB L51

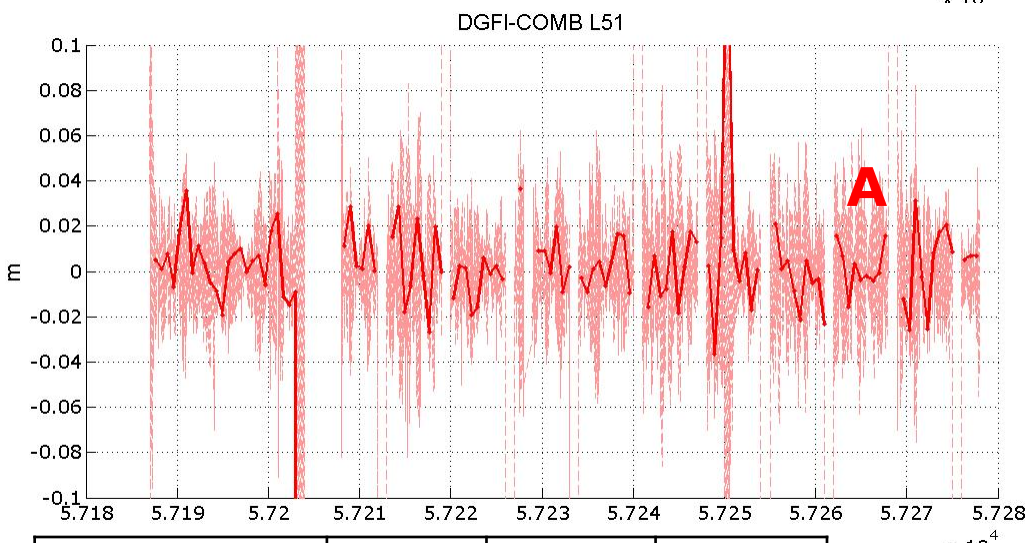
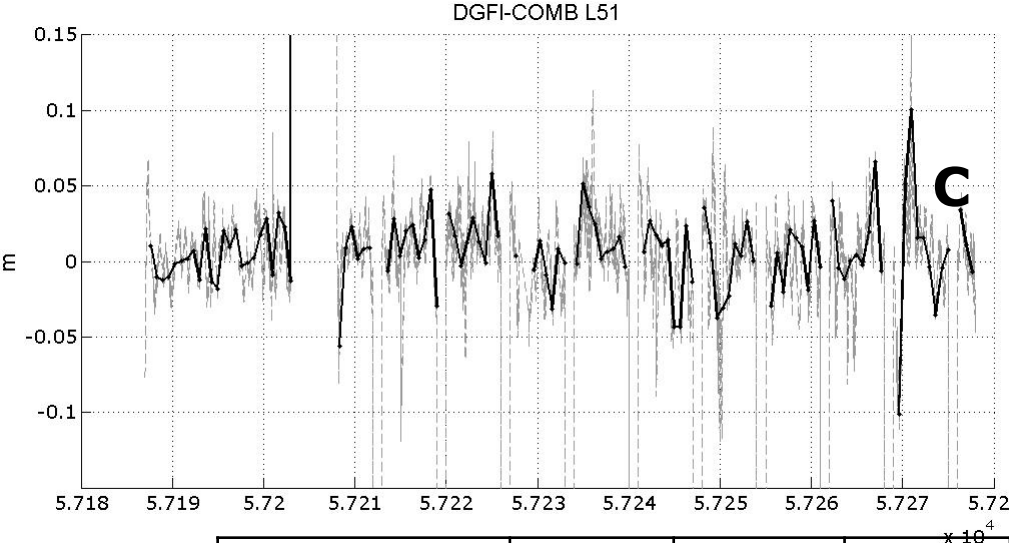
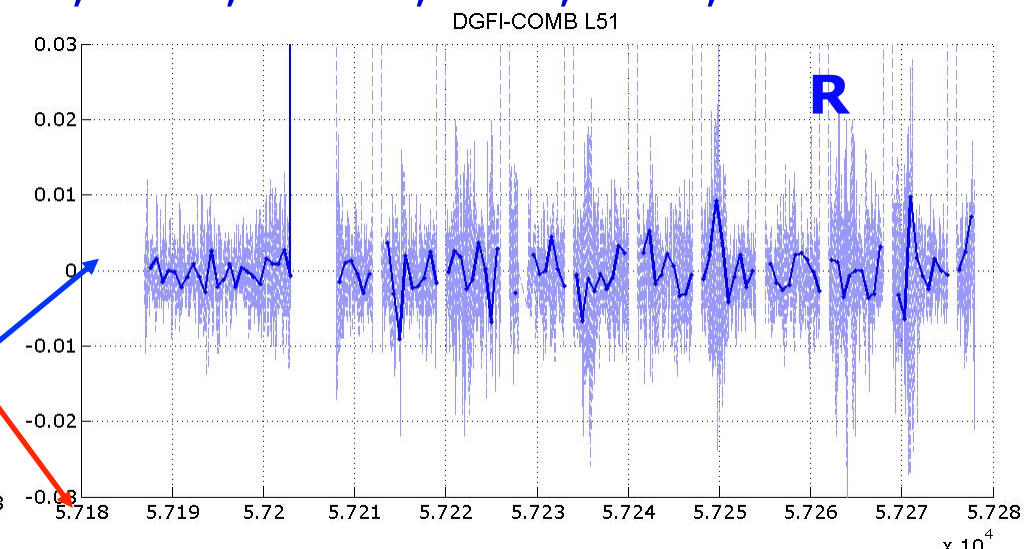
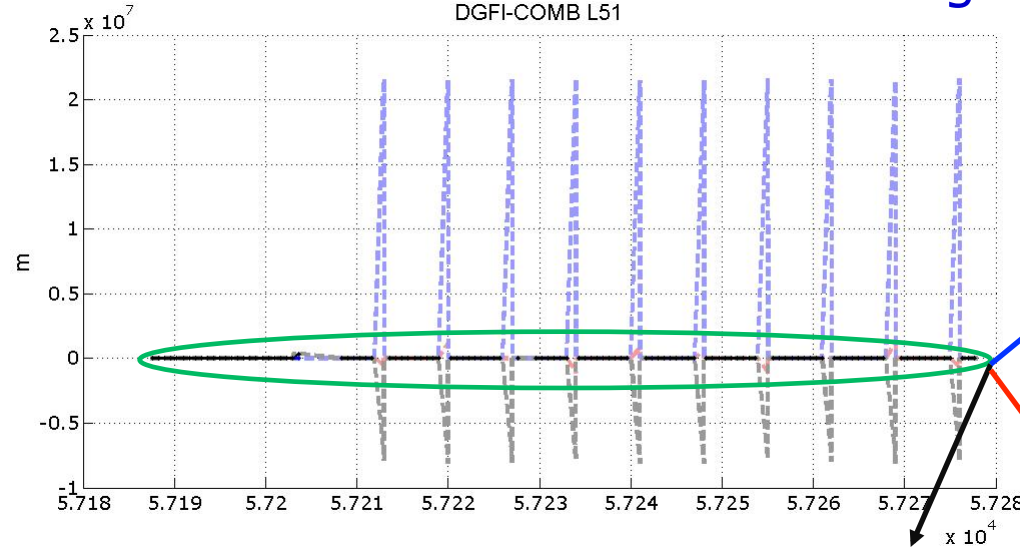


	MEAN [mm]	STD [mm]
R	0.2	5.4
A	-0.2	16.7
C	3.9	29.4



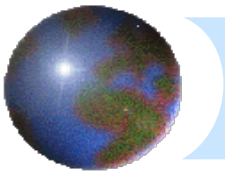
L51 ACs vs Combination

Test combination for L51 using ASI, BKG, **DGFI**, ESA, GFZ, NSGF



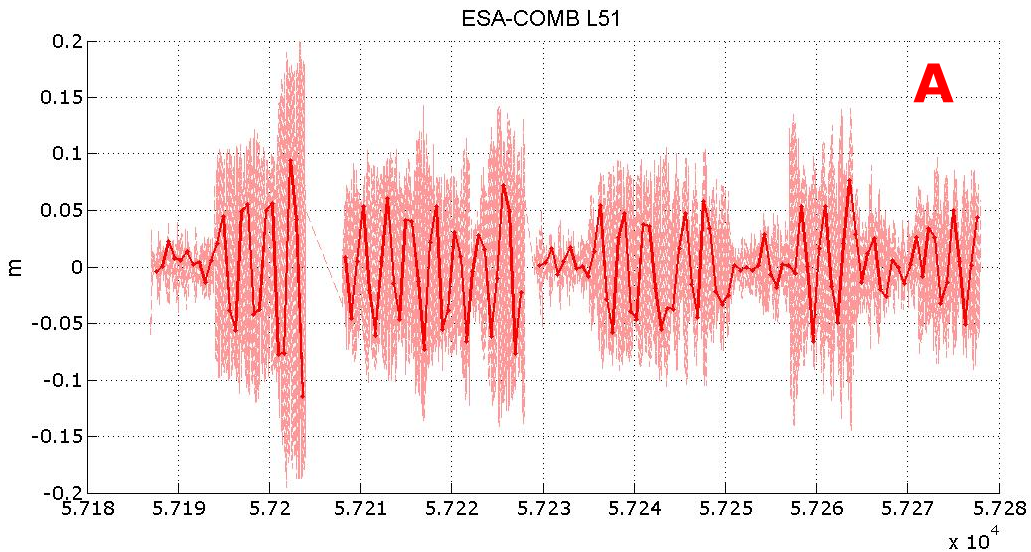
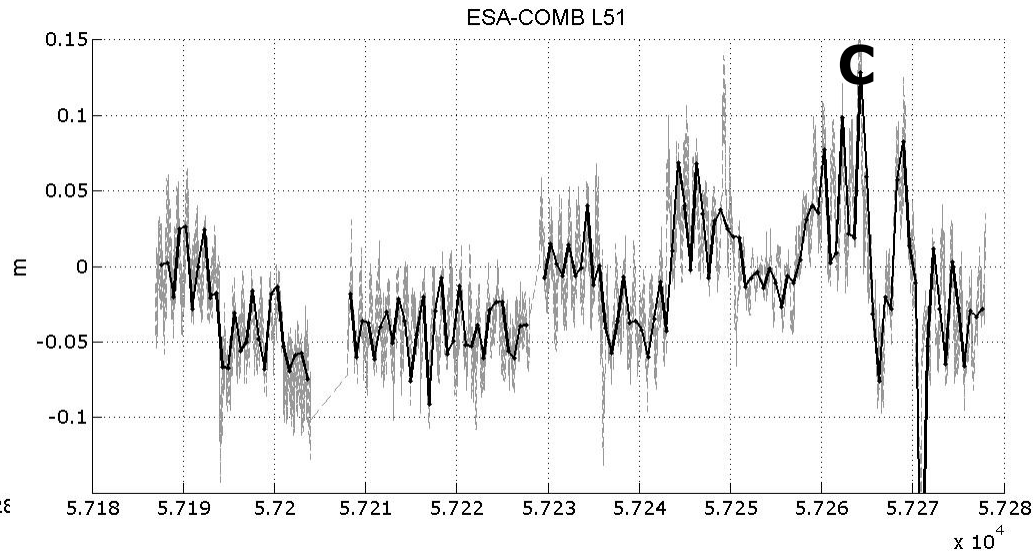
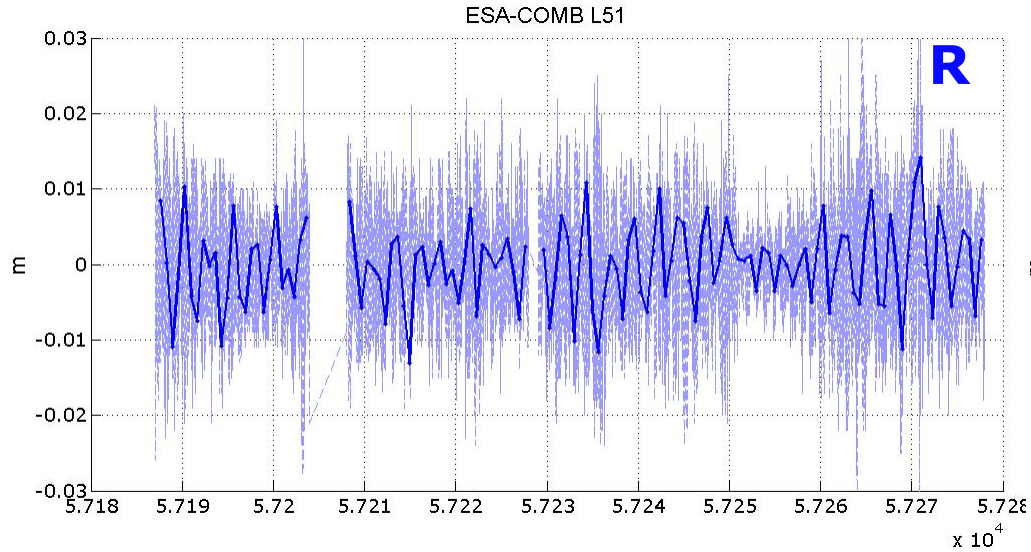
	R	A	C
MEAN [mm]	2.1	-0.9	3.3

	R	A	C
STD [mm]	6.6	14.5	20.2

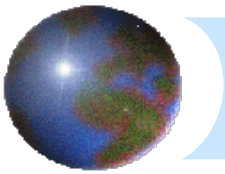


L51 ACs vs Combination

Test combination for L51 using ASI, BKG, DGFI, **ESA**, GFZ, NSGF



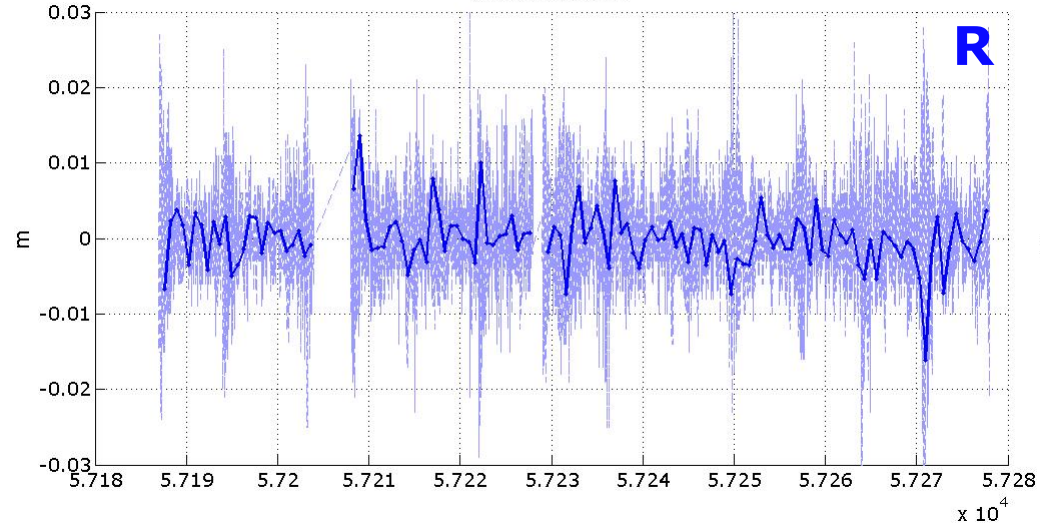
	MEAN [mm]	STD [mm]
R	-0.3	7.5
A	0.5	54.2
C	-15.8	42.7



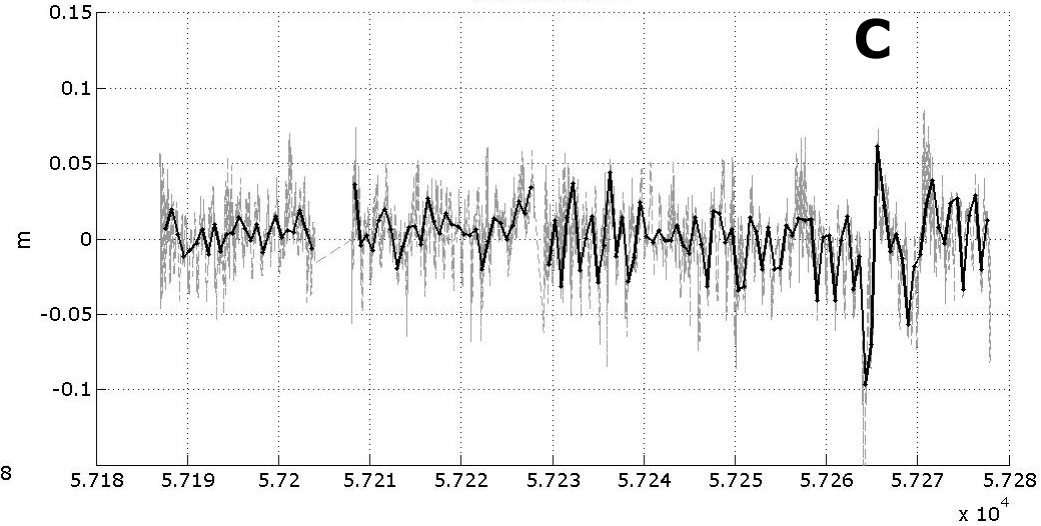
L51 ACs vs Combination

Test combination for L51 using ASI, BKG, DGFI, ESA, **GFZ**, NSGF

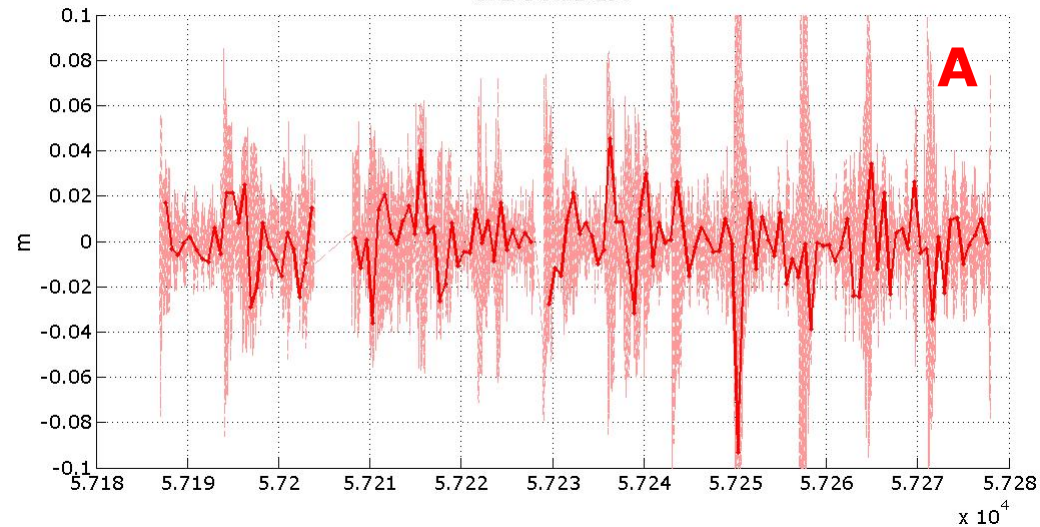
GFZ-COMB L51



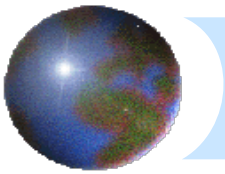
GFZ-COMB L51



GFZ-COMB L51



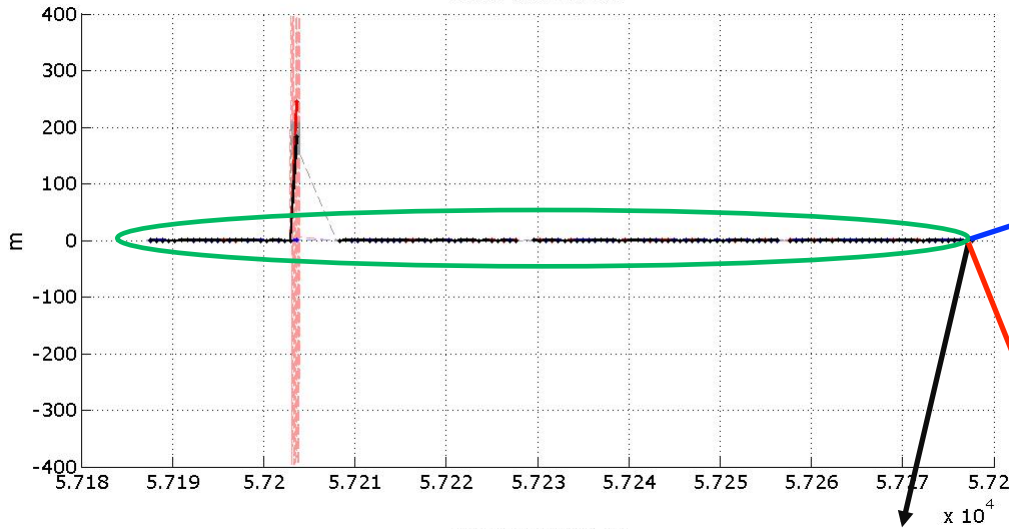
	MEAN [mm]	STD [mm]
R	0.4	5.8
A	-0.1	25.3
C	0.8	25.3



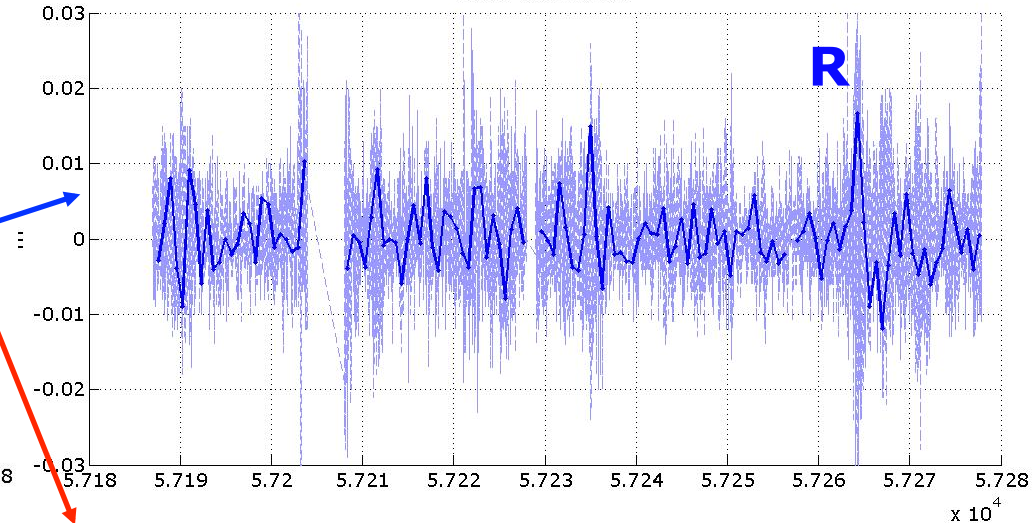
L51 ACs vs Combination

Test combination for L51 using ASI, BKG, DGFI, ESA, GFZ, **NSGF**

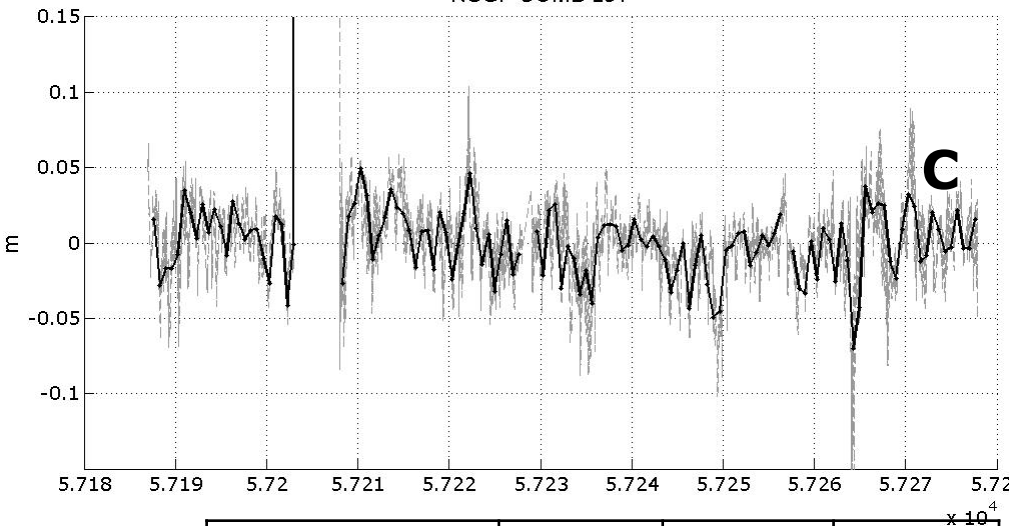
NSGF-COMB L51



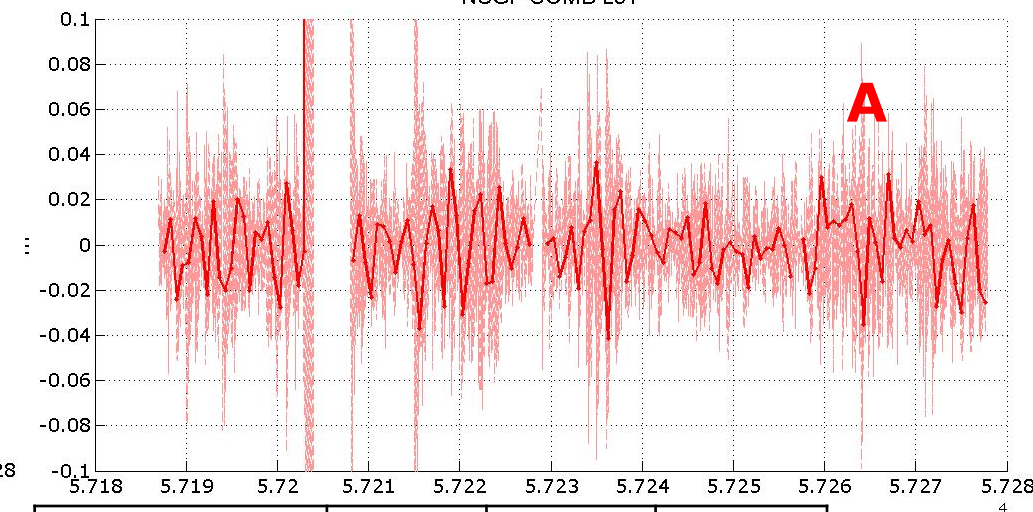
NSGF-COMB L51



NSGF-COMB L51

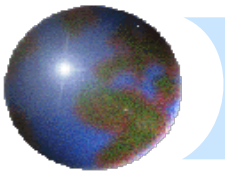


NSGF-COMB L51



	R	A	C
MEAN [mm]	0.4	1.0	-3.3

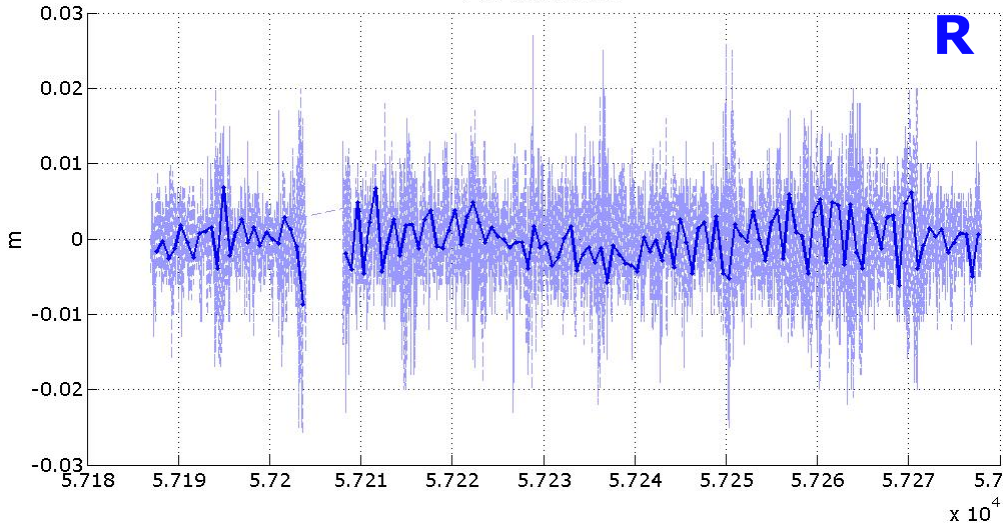
	R	A	C
STD [mm]	6.3	18.3	21.7



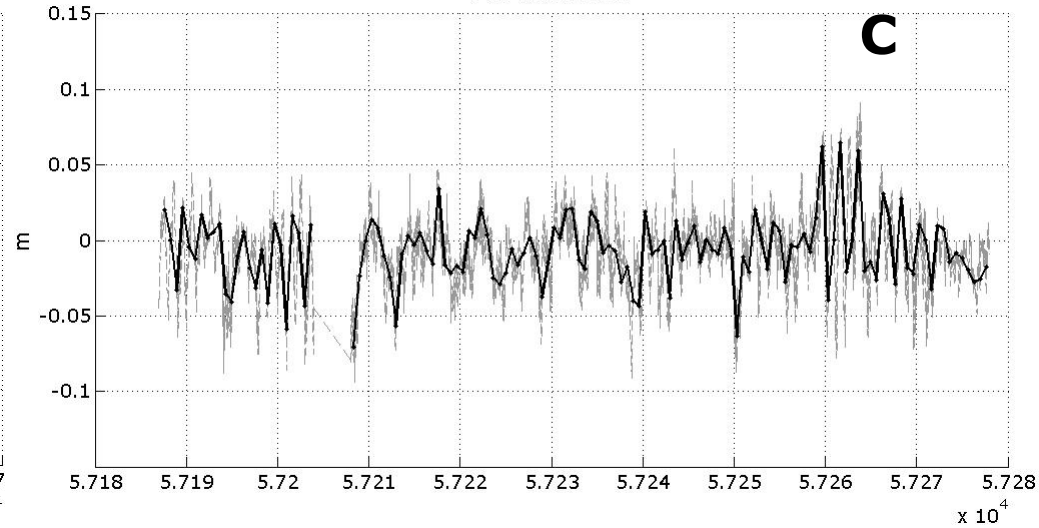
L52 ACs vs Combination

Test combination for L52 using **ASI**, BKG, DGFI, ESA, GFZ, NSGF

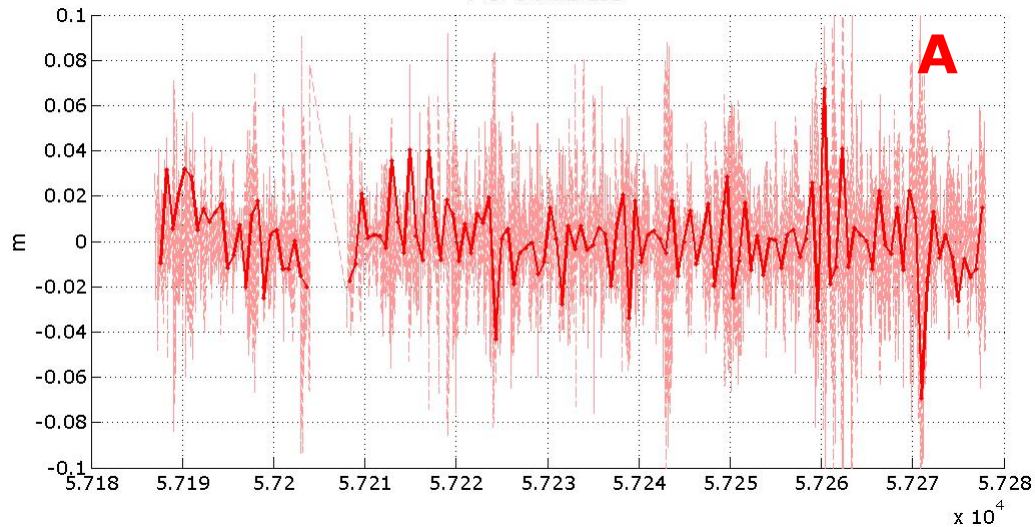
ASI-COMB L52



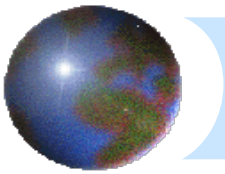
ASI-COMB L52



ASI-COMB L52



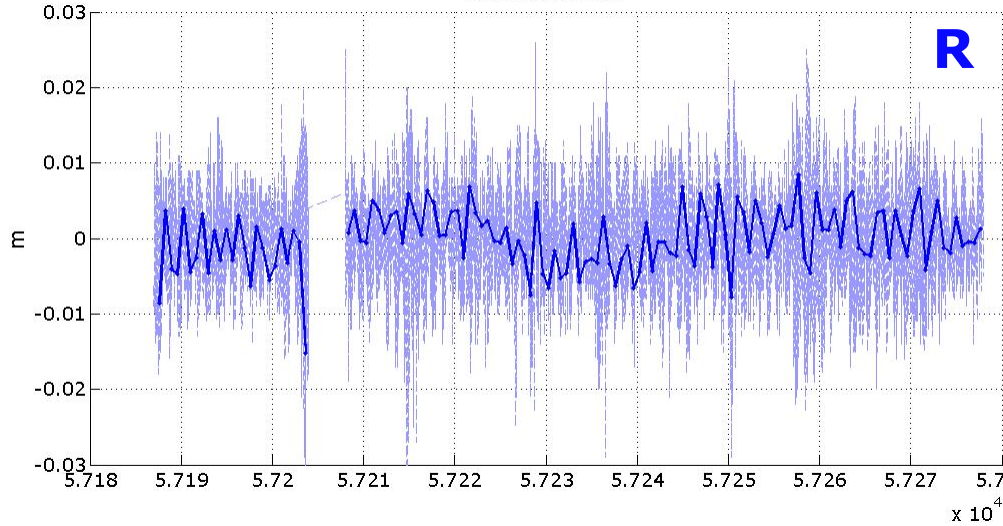
	MEAN [mm]	STD [mm]
R	-2.3	5.1
A	0.1	42.9
C	-7.2	23.7



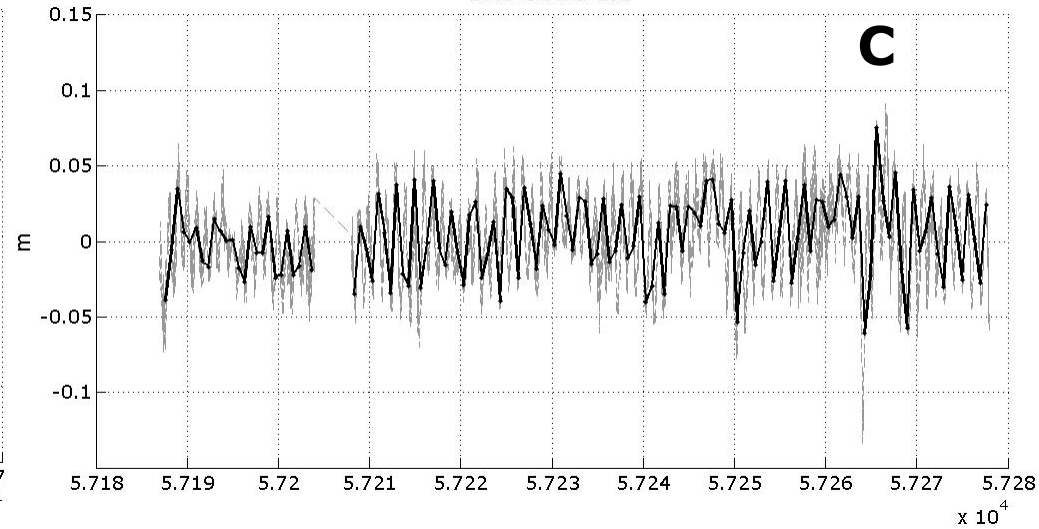
L52 ACs vs Combination

Test combination for L52 using ASI, **BKG**, DGFI, ESA, GFZ, NSGF

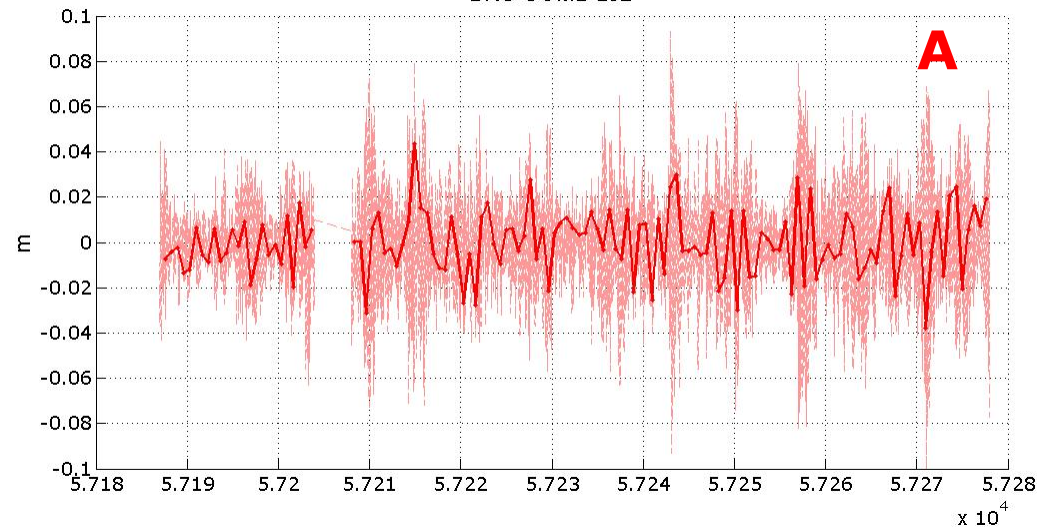
BKG-COMB L52



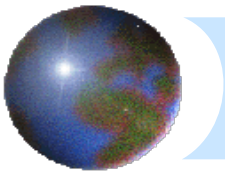
BKG-COMB L52



BKG-COMB L52

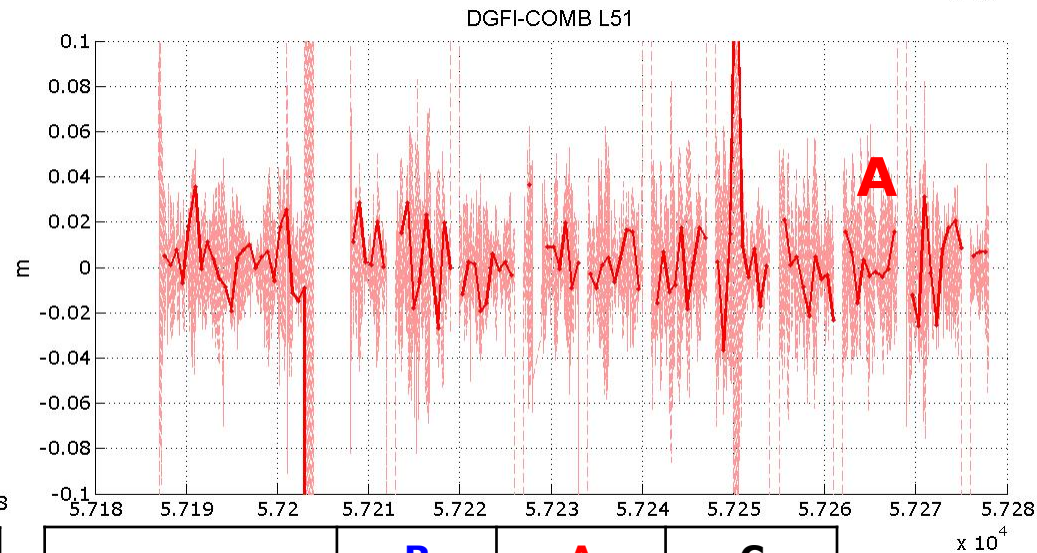
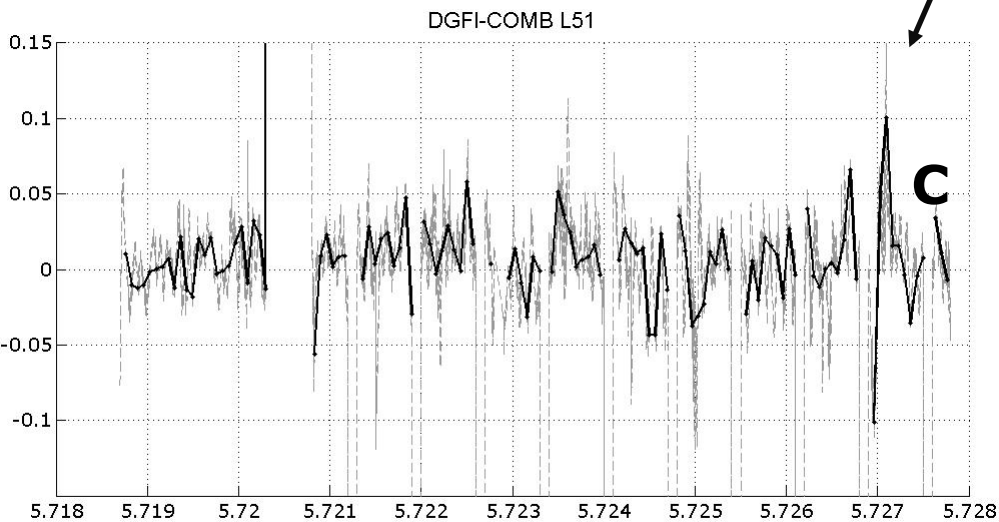
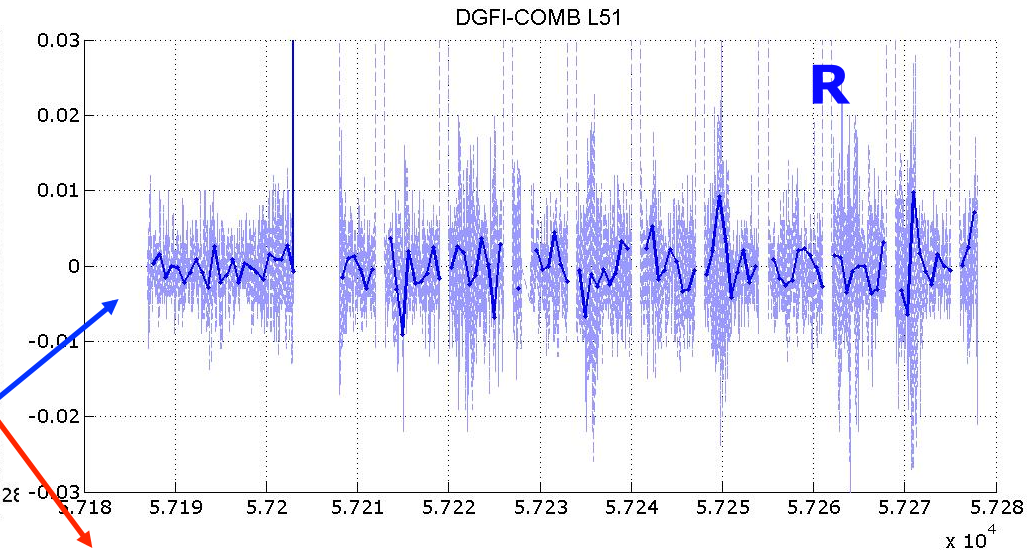
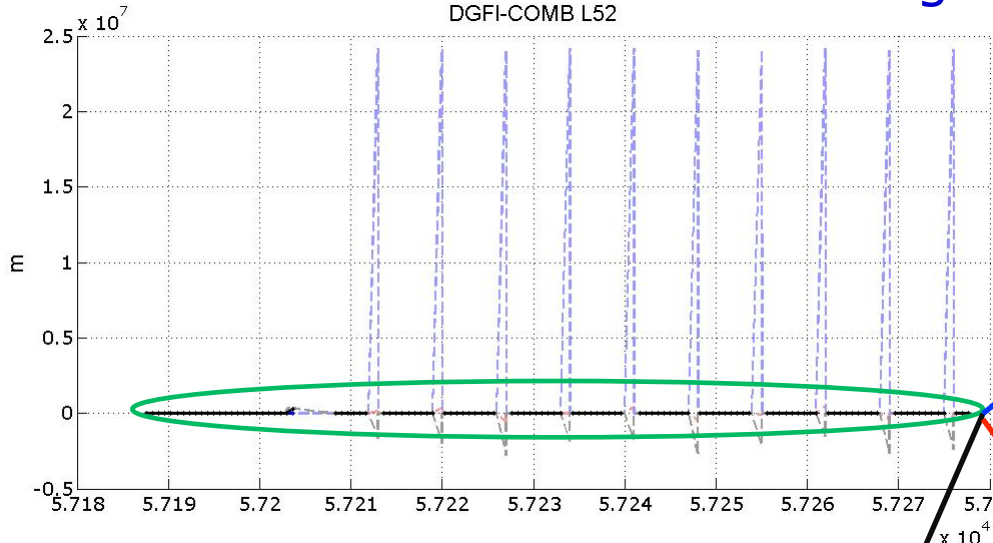


	MEAN [mm]	STD [mm]
R	-0.1	5.9
A	-0.8	21.1
C	1.8	25.6



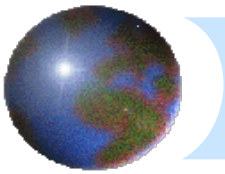
L52 ACs vs Combination

Test combination for L52 using ASI, BKG, **DGFI**, ESA, GFZ, NSGF



	R	A	C
MEAN [mm]	0.4	0.9	-3.0

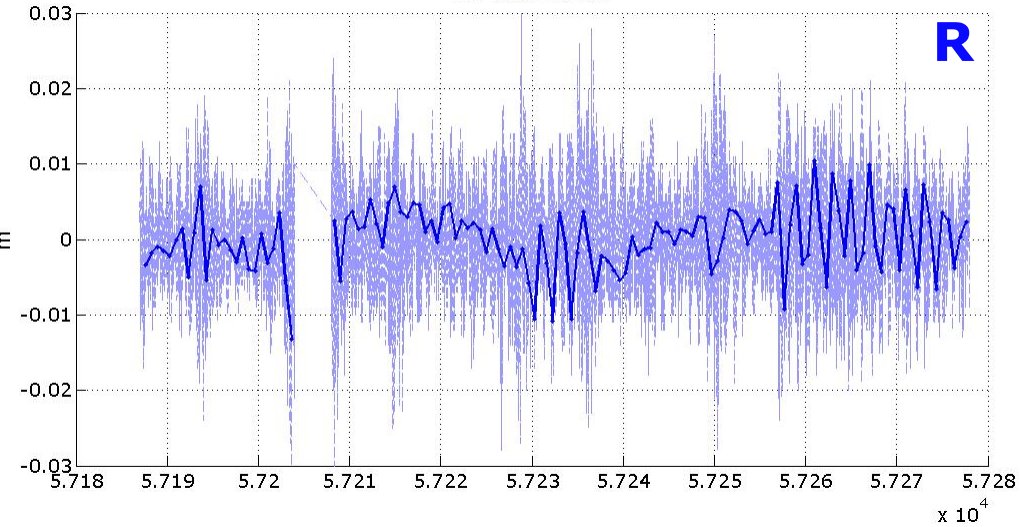
	R	A	C
STD [mm]	5.2	20.1	23.5



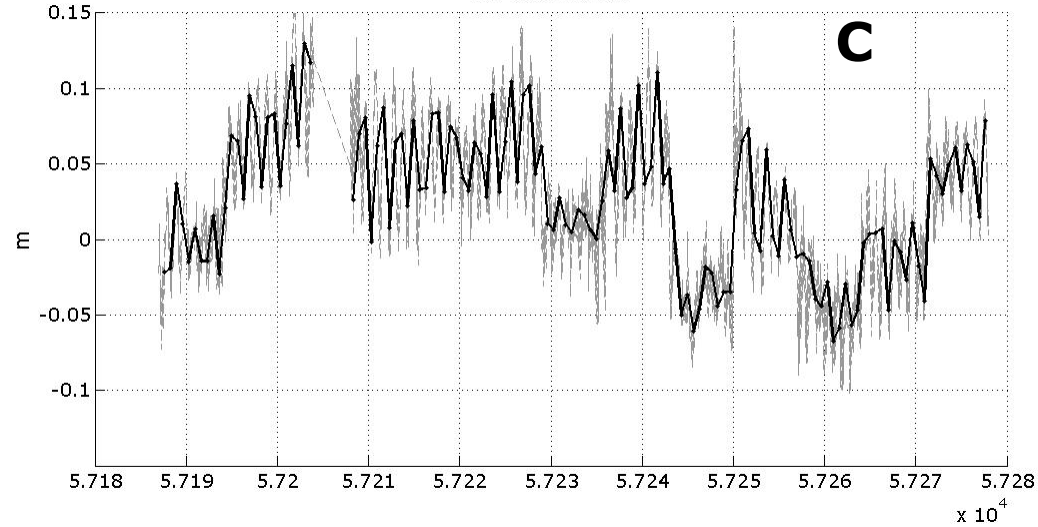
L52 ACs vs Combination

Test combination for L52 using ASI, BKG, DGFI, **ESA**, GFZ, NSGF

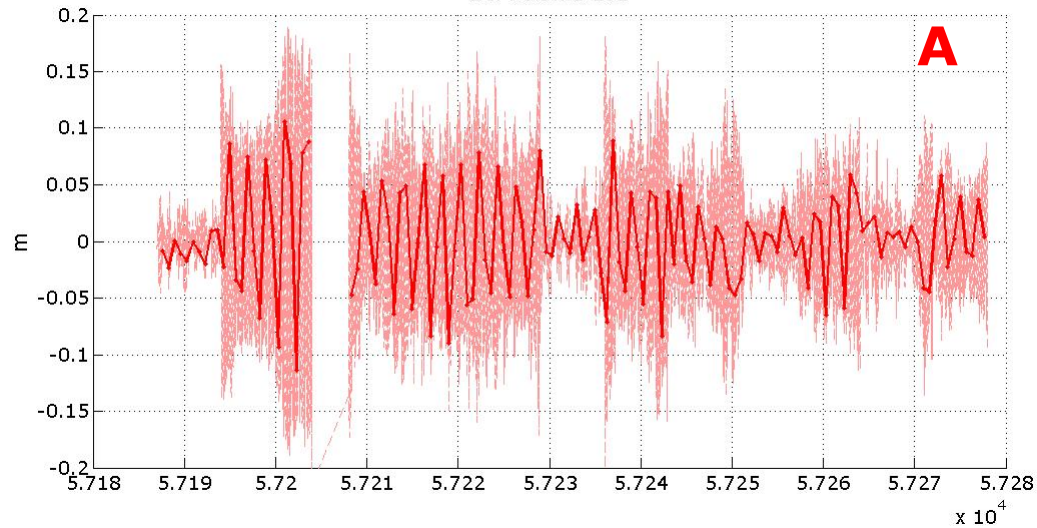
ESA-COMB L52



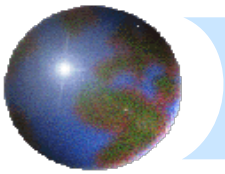
ESA-COMB L52



ESA-COMB L52



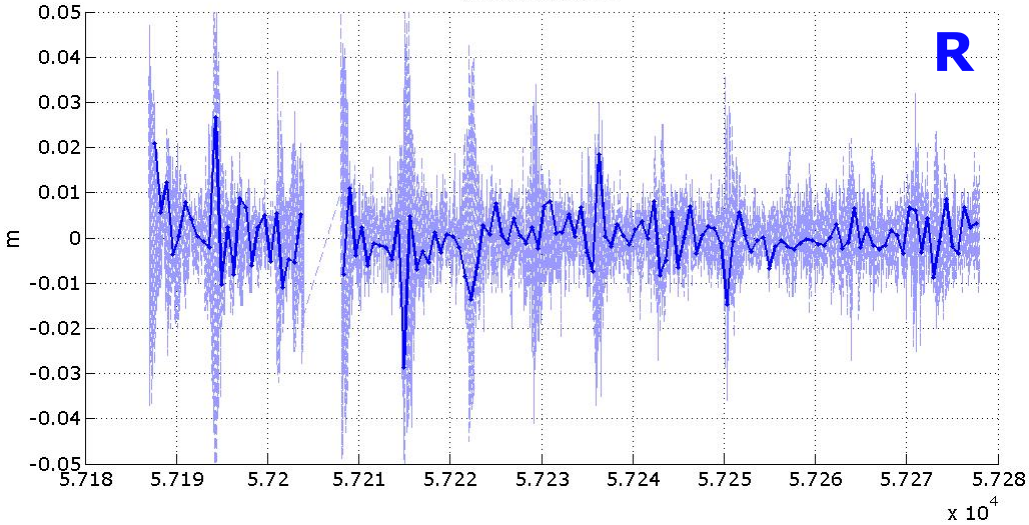
	MEAN [mm]	STD [mm]
R	-0.3	6.4
A	0.5	58.8
C	26.3	47.1



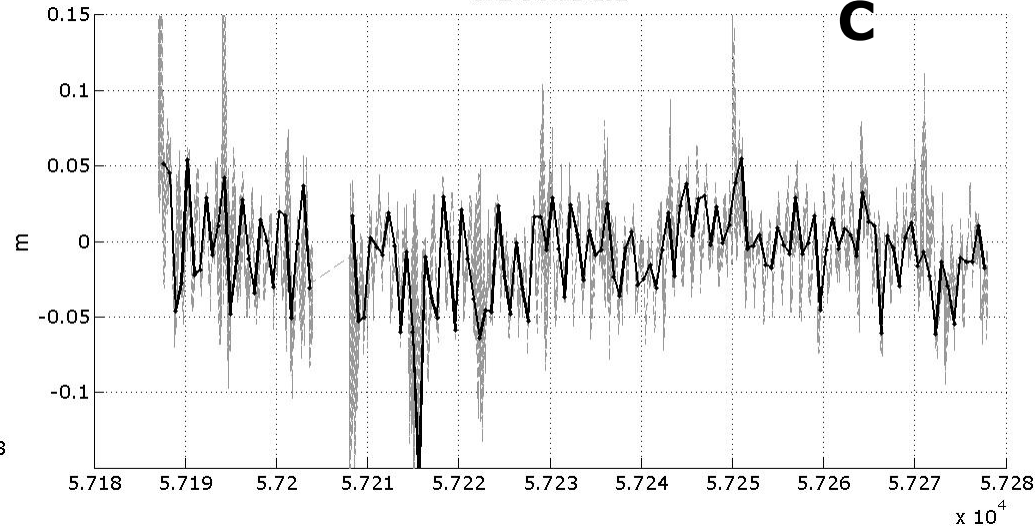
L52 ACs vs Combination

Test combination for L52 using ASI, BKG, DGFI, ESA, **GFZ**, NSGF

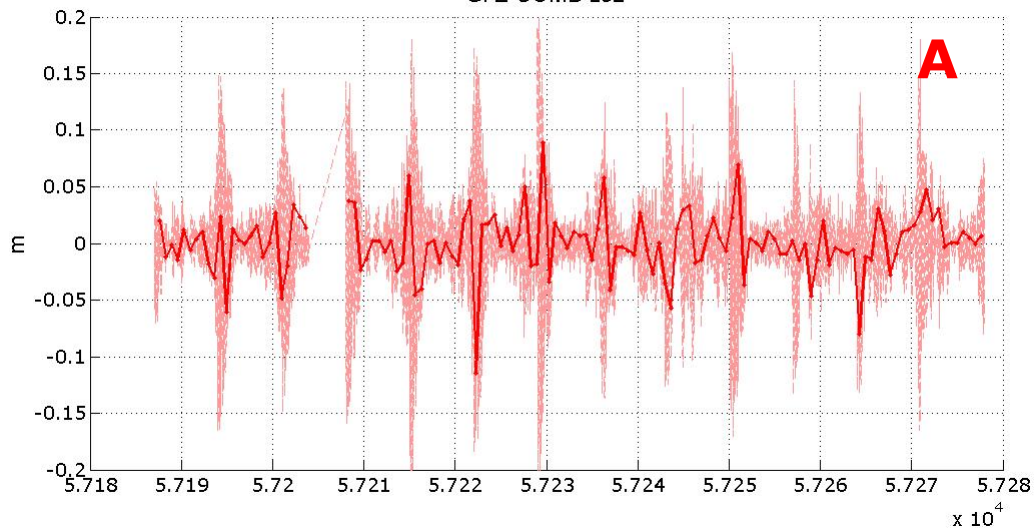
GFZ-COMB L52



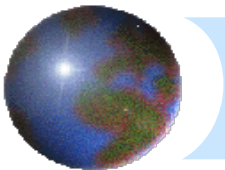
GFZ-COMB L52



GFZ-COMB L52



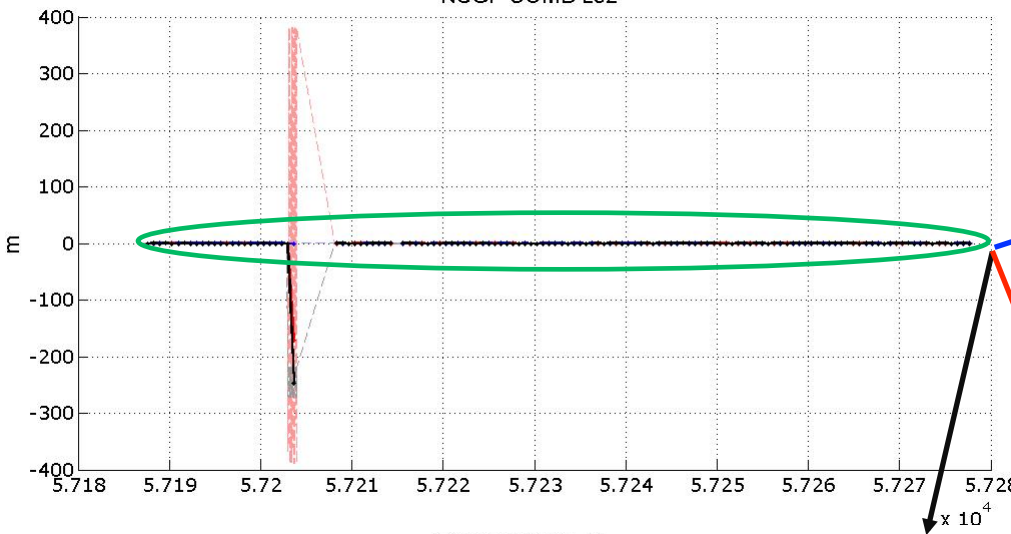
	MEAN [mm]	STD [mm]
R	0.2	9.6
A	-0.4	40.7
C	-7.9	33.9



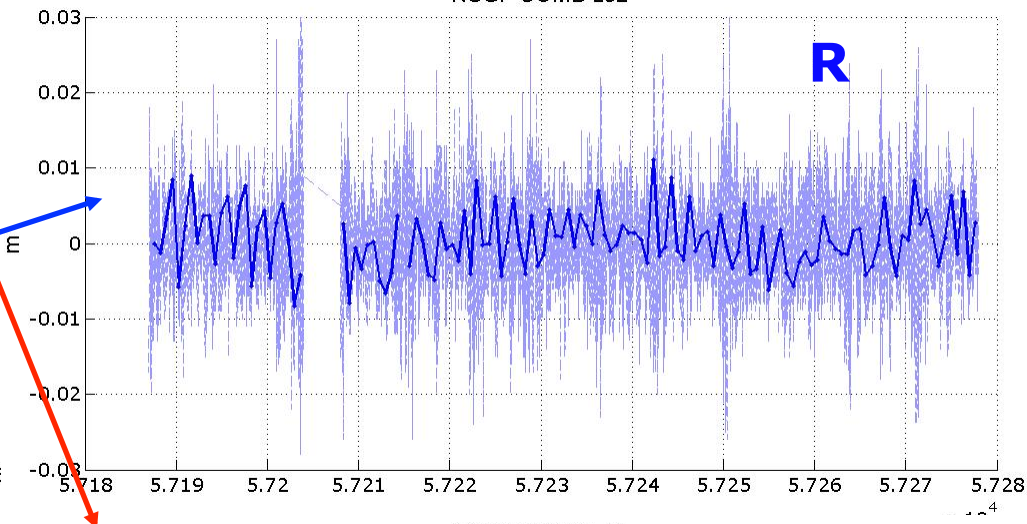
L52 ACs vs Combination

Test combination for L52 using ASI, BKG, DGFI, ESA, GFZ, **NSGF**

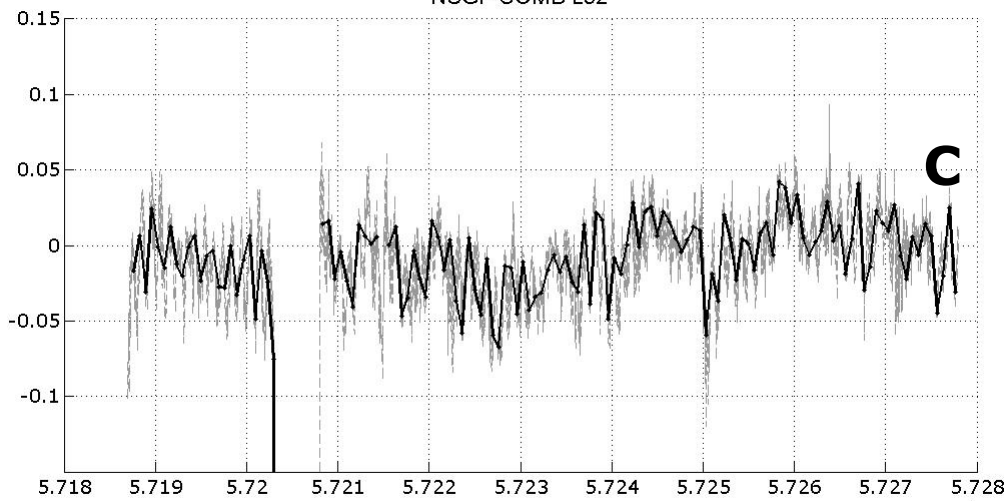
NSGF-COMB L52



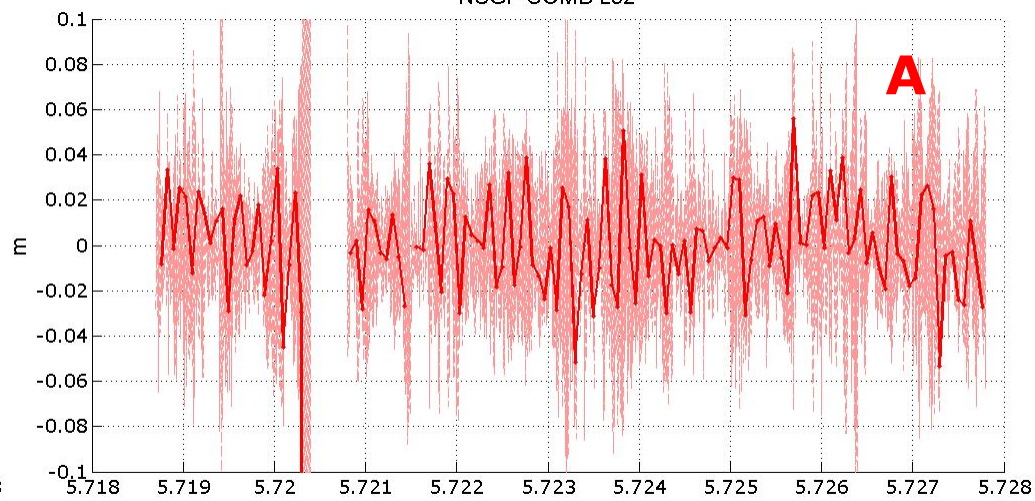
NSGF-COMB L52



NSGF-COMB L52

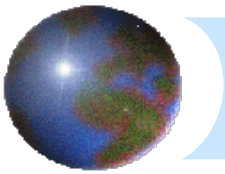


NSGF-COMB L52



	R	A	C
MEAN [mm]	0.2	-0.4	0.3

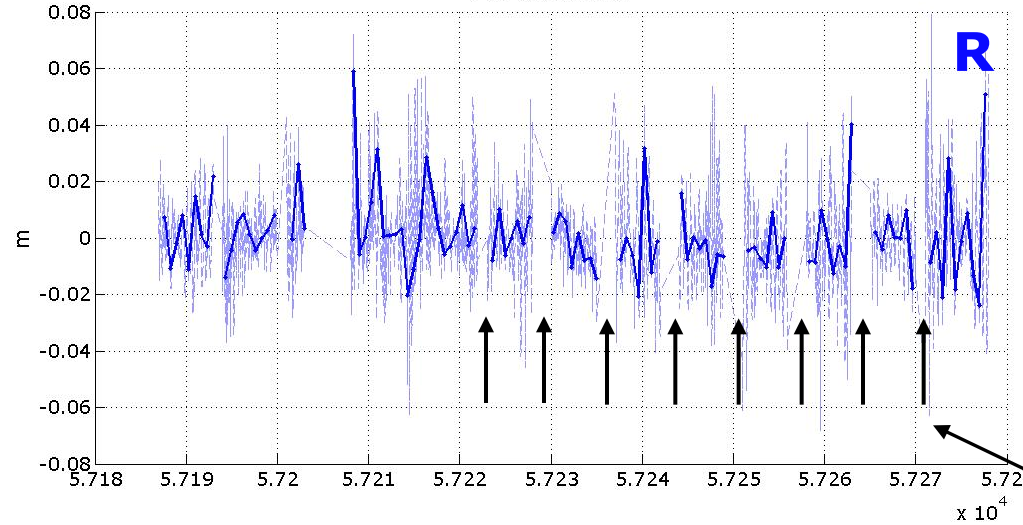
	R	A	C
STD [mm]	6.1	22.3	19.2



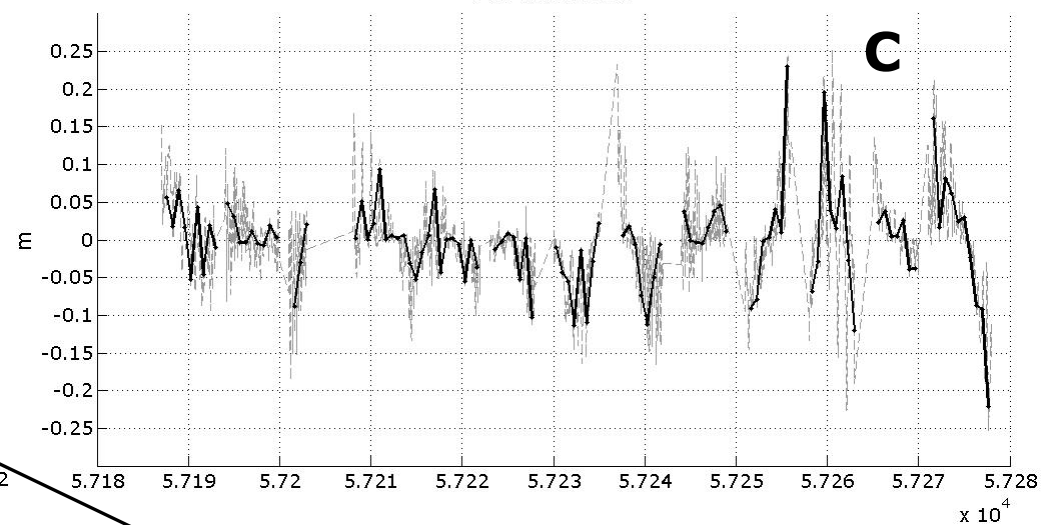
L53 ACs vs Combination

Test combination for L53 using **ASI**, ESA, NSGF

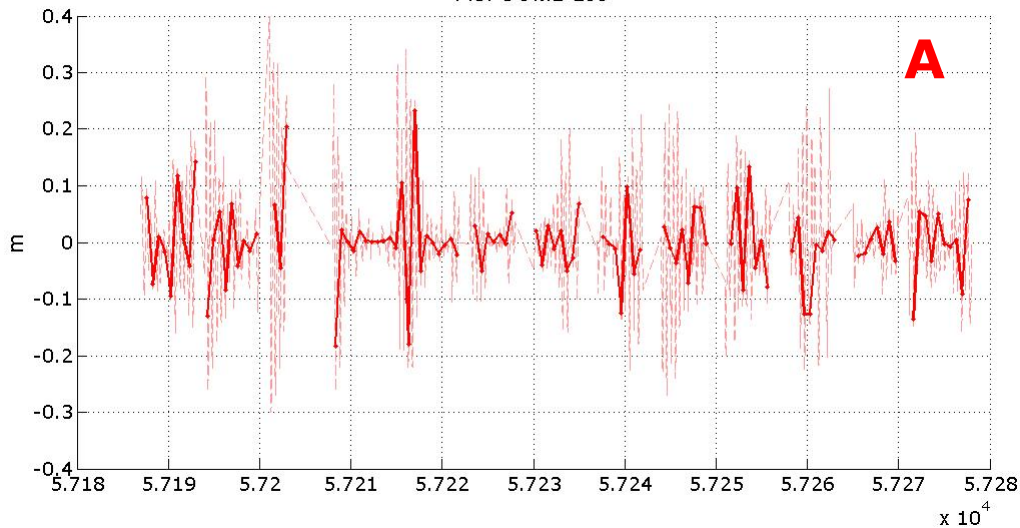
ASI-COMB L53



ASI-COMB L53

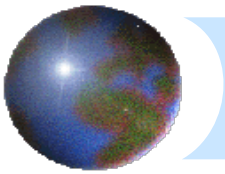


ASI-COMB L53



Gaps to investigate for all ACs
(#AC < 3: NSGF excluded, BKG not considered for wrong epochs)

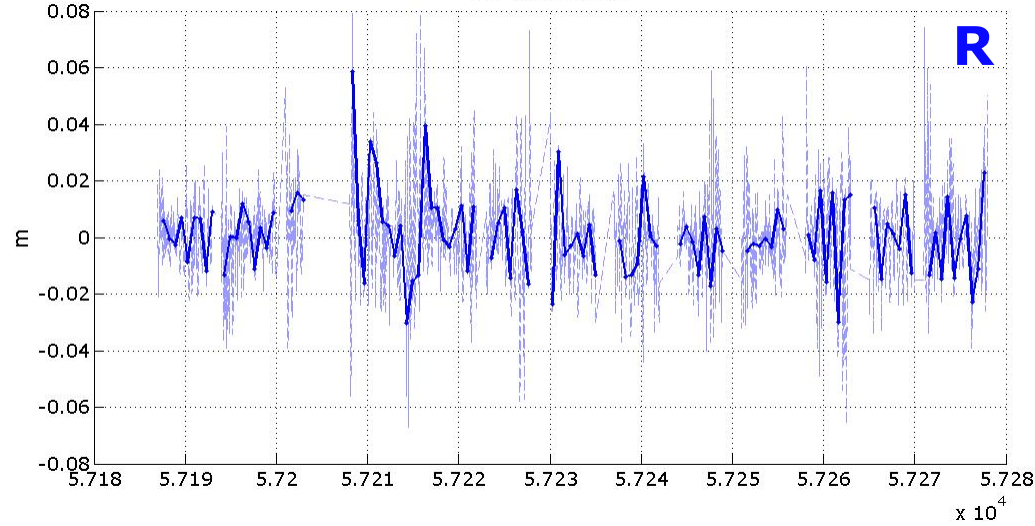
	MEAN [mm]	STD [mm]
R	3.5	14.6
A	3.1	78.5
C	-1.3	59.3



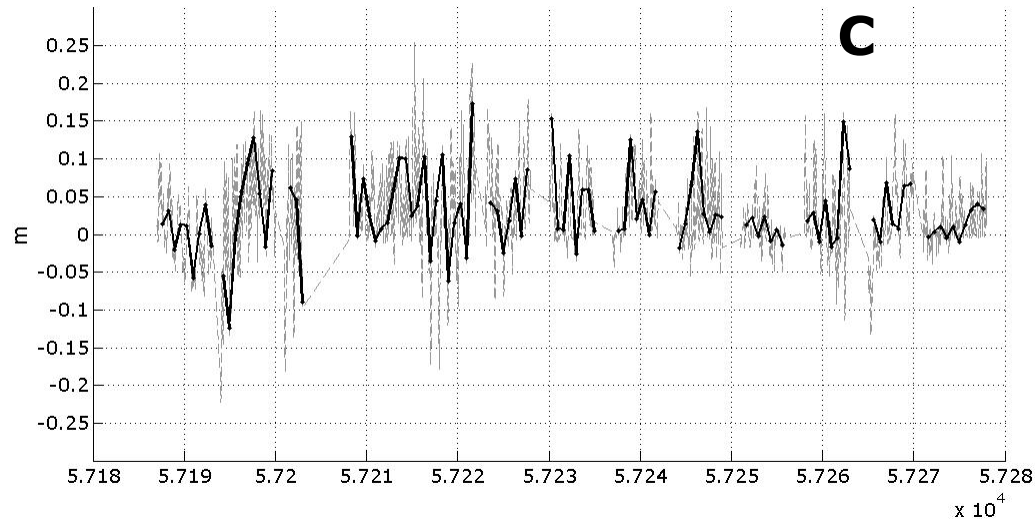
L53 ACs vs Combination

Test combination for L53 using ASI, **ESA**, NSGF

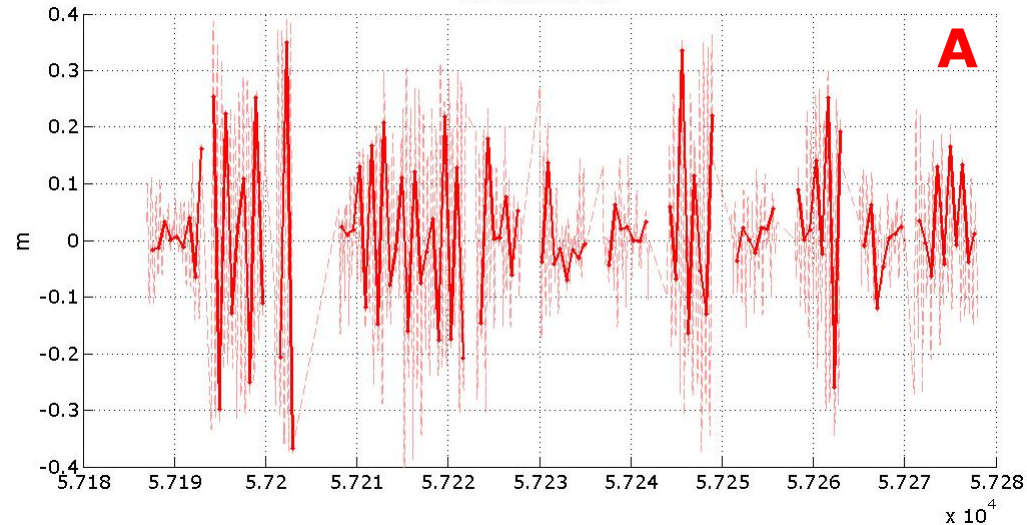
ESA-COMB L53



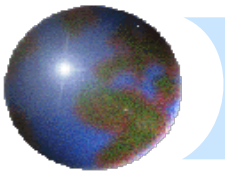
ESA-COMB L53



ESA-COMB L53



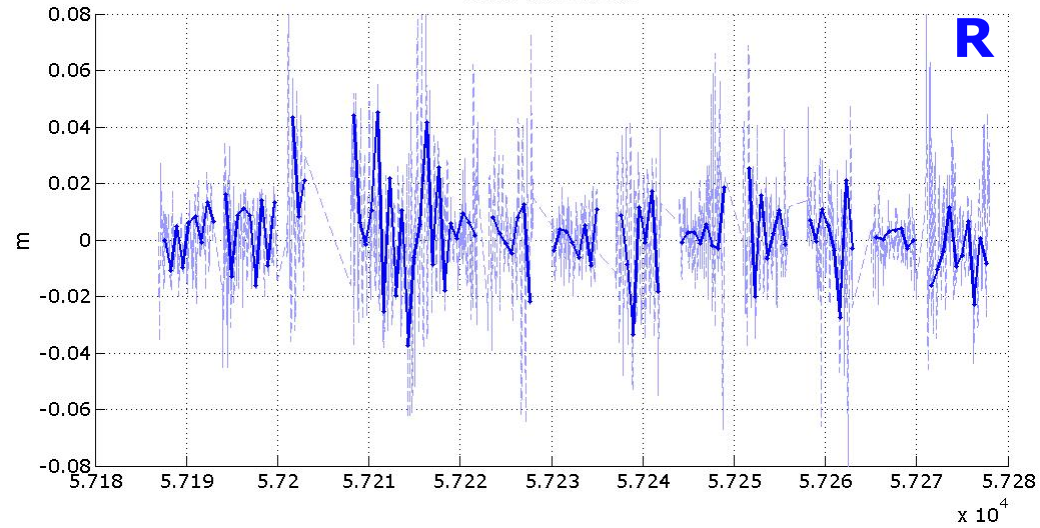
	MEAN [mm]	STD [mm]
R	1.6	17.4
A	0.7	107.0
C	-35.5	91.0



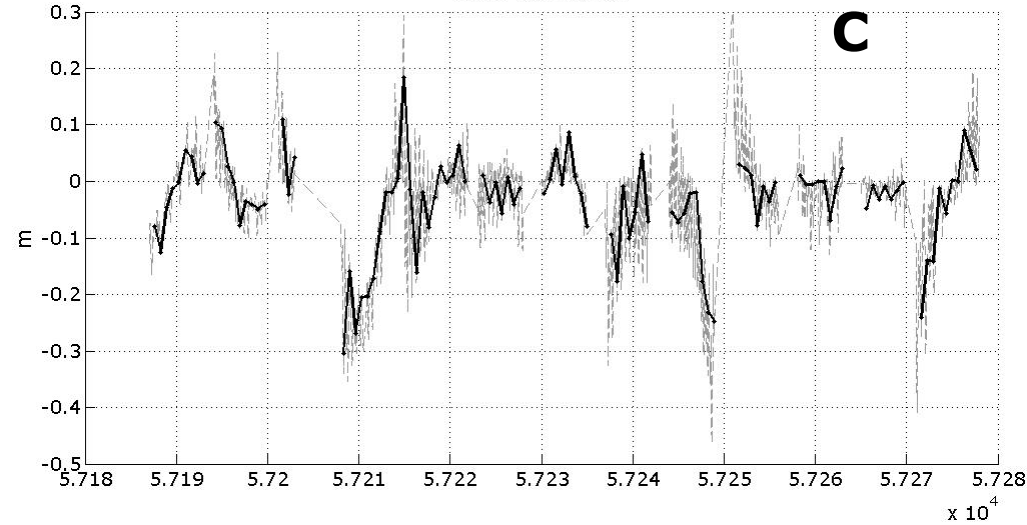
L53 ACs vs Combination

Test combination for L53 using ASI, ESA, **NSGF**

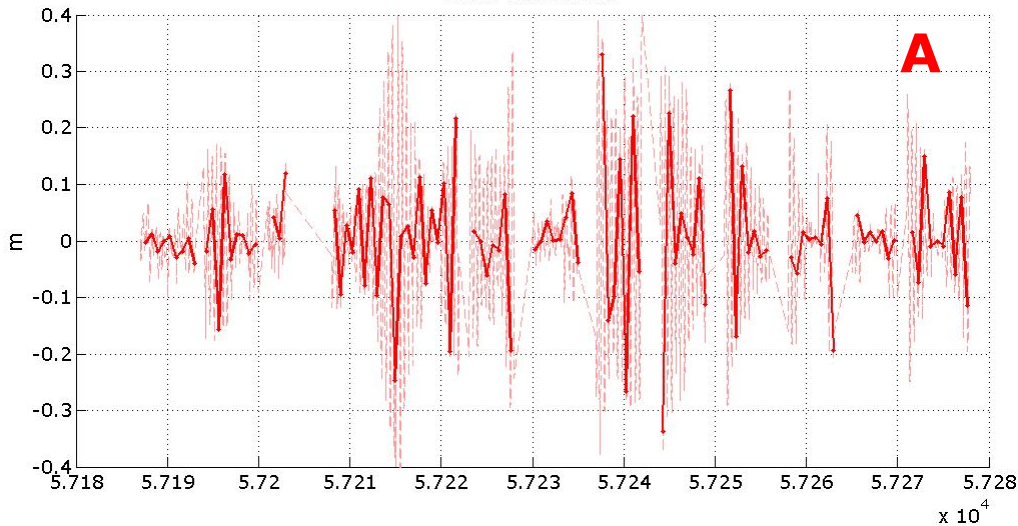
NSGF-COMB L53



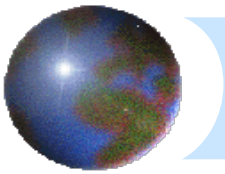
NSGF-COMB L53



NSGF-COMB L53



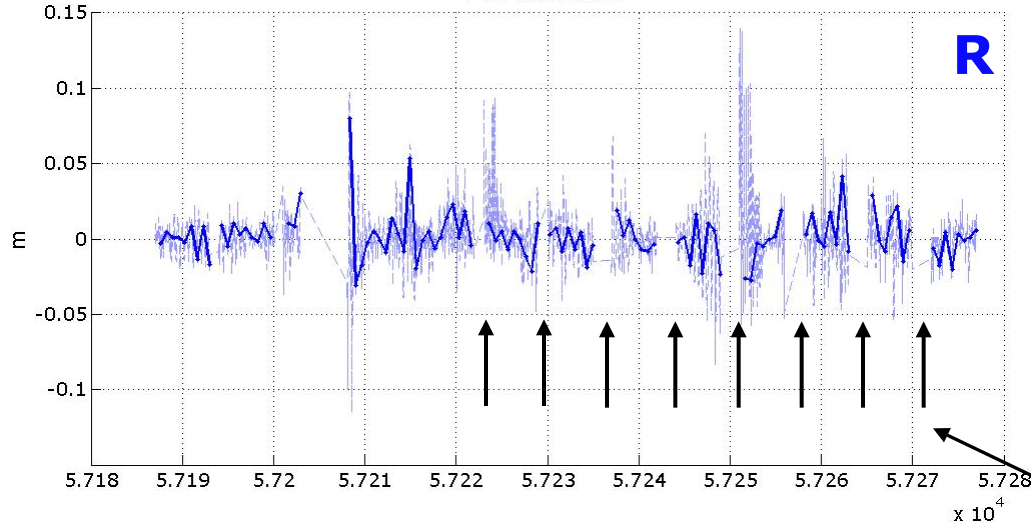
	MEAN [mm]	STD [mm]
R	0.1	15.6
A	-5.7	132.0
C	-35.5	102.0



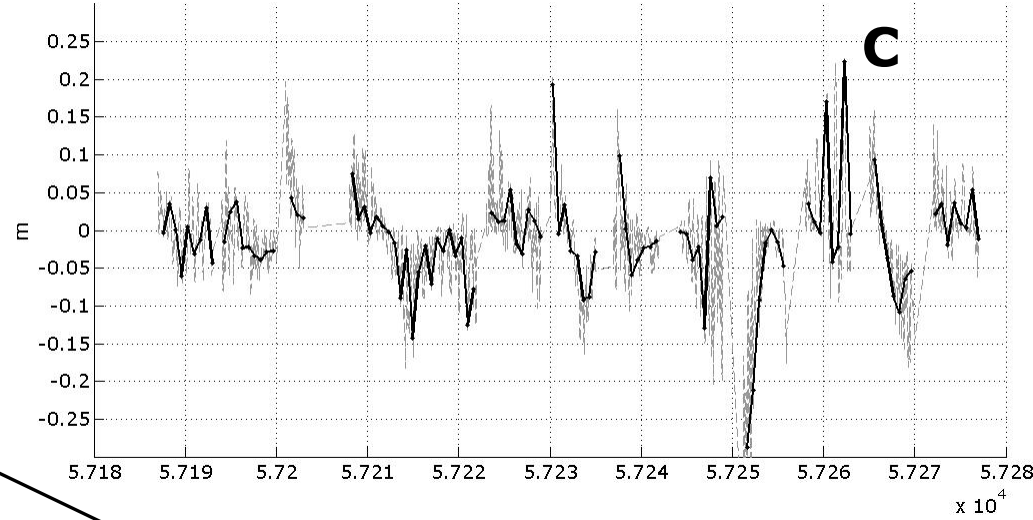
L54 ACs vs Combination

Test combination for L54 using **ASI**, ESA, NSGF

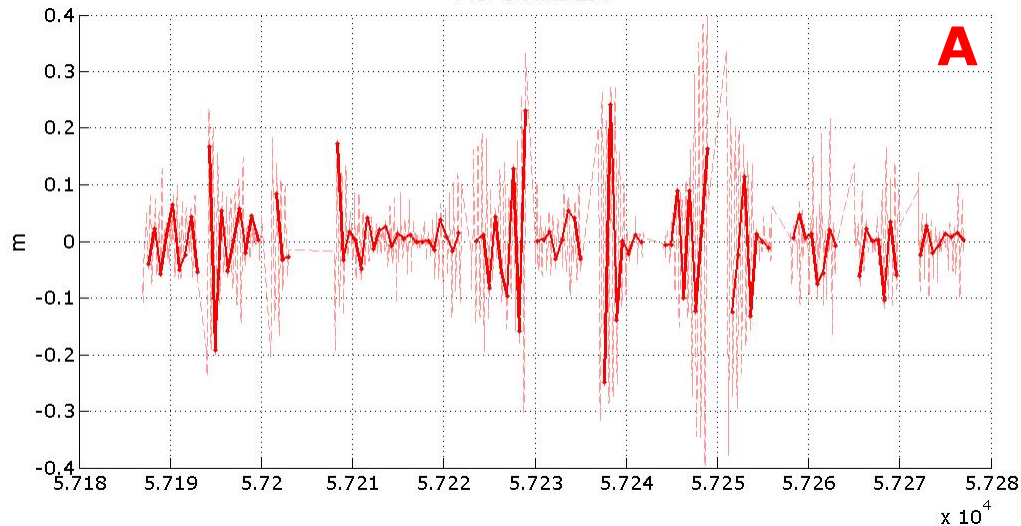
ASI-COMB L54



ASI-COMB L54

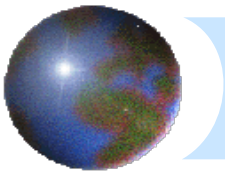


ASI-COMB L54



Gaps to investigate for all ACs
(#AC < 3: NSGF excluded, BKG not considered for wrong epochs)

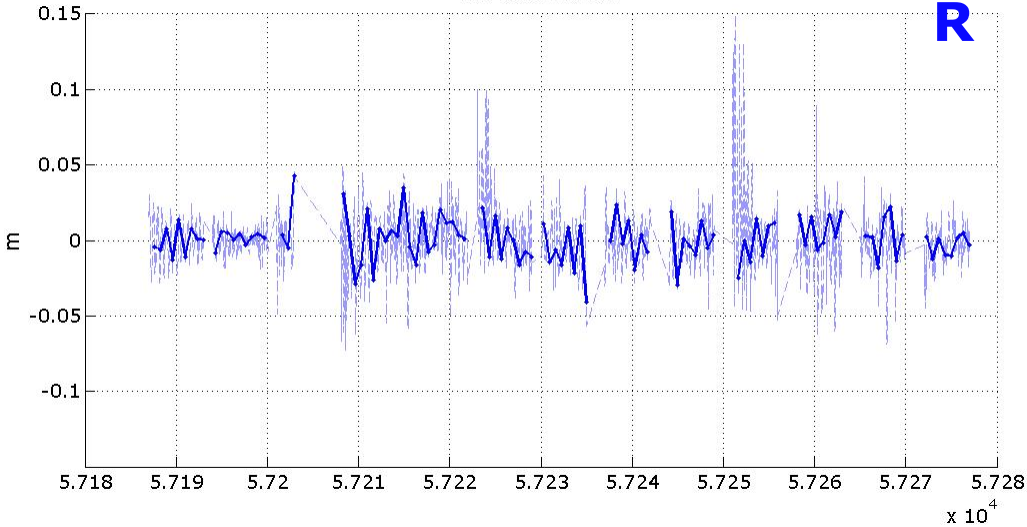
	MEAN [mm]	STD [mm]
R	1.0	17.7
A	-1.0	80.7
C	-12.5	66.9



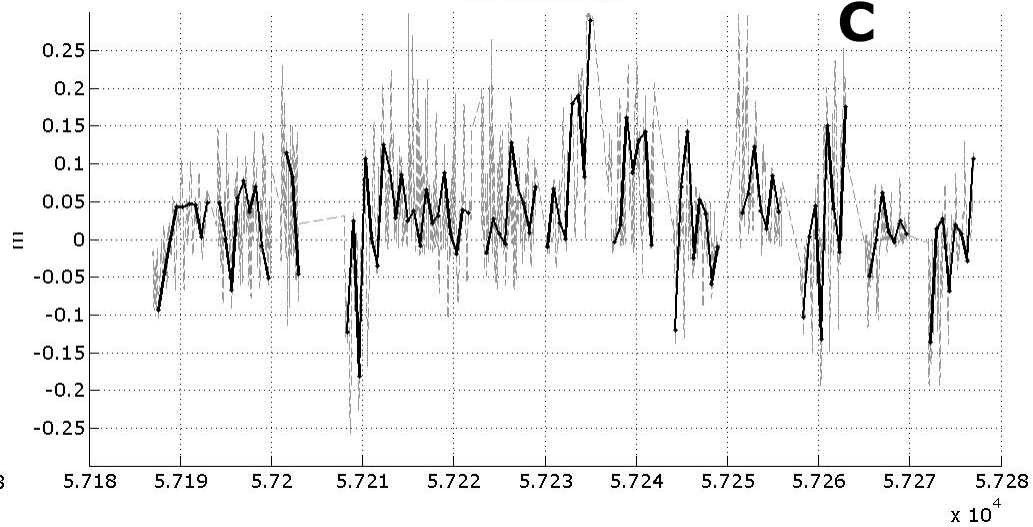
L54 ACs vs Combination

Test combination for L54 using ASI, **ESA**, NSGF

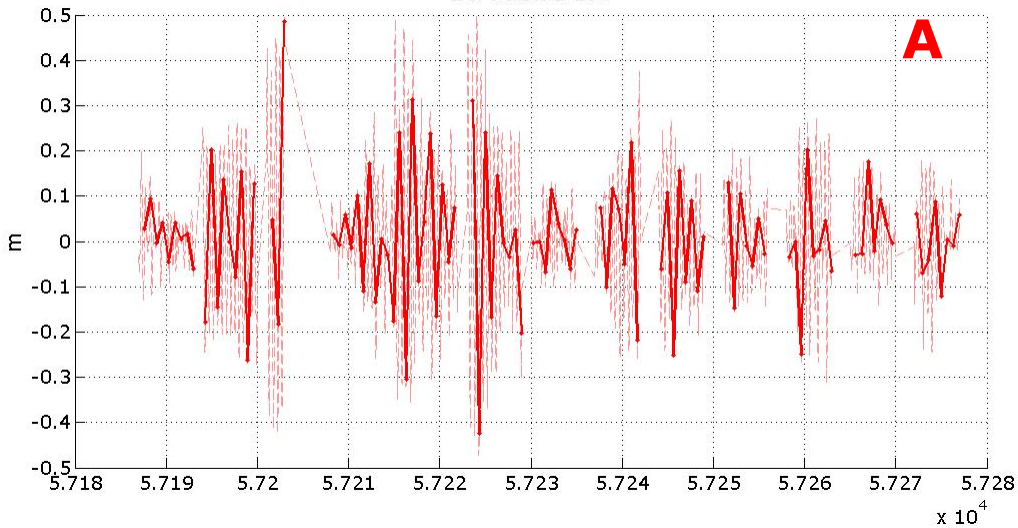
ESA-COMB L54



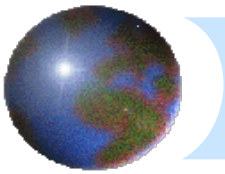
ESA-COMB L54



ESA-COMB L54



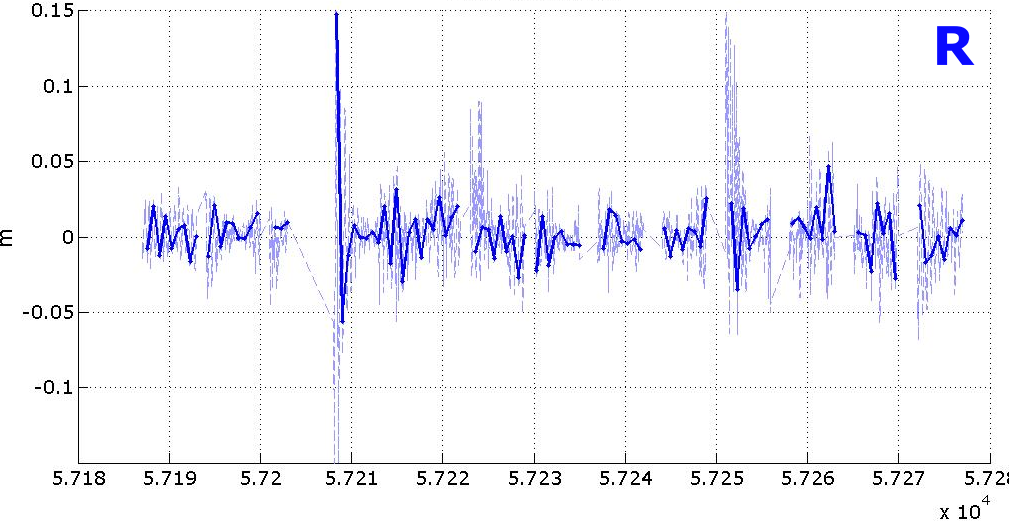
	MEAN [mm]	STD [mm]
R	1.6	21.5
A	-1.8	108.0
C	-11.2	61.8



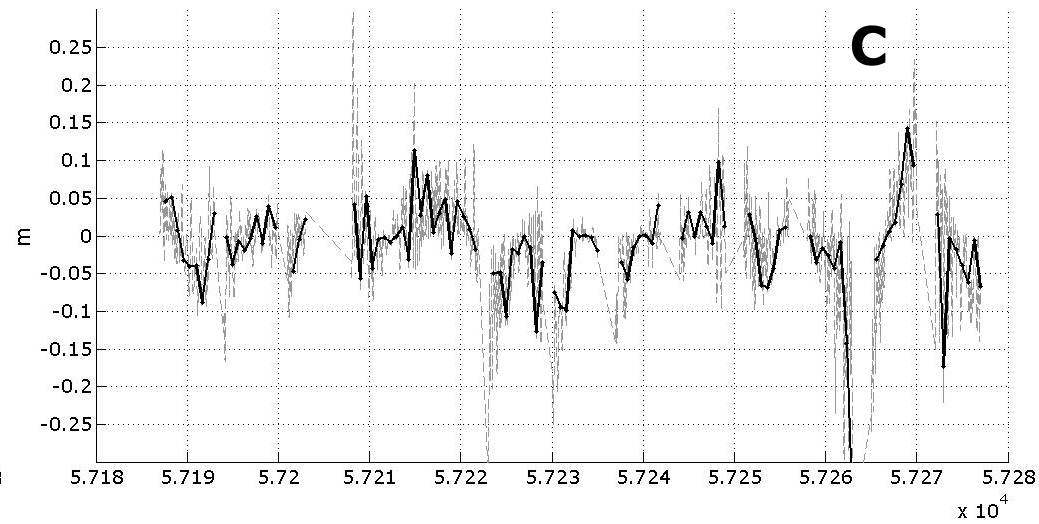
L54 ACs vs Combination

Test combination for L54 using ASI, ESA, **NSGF**

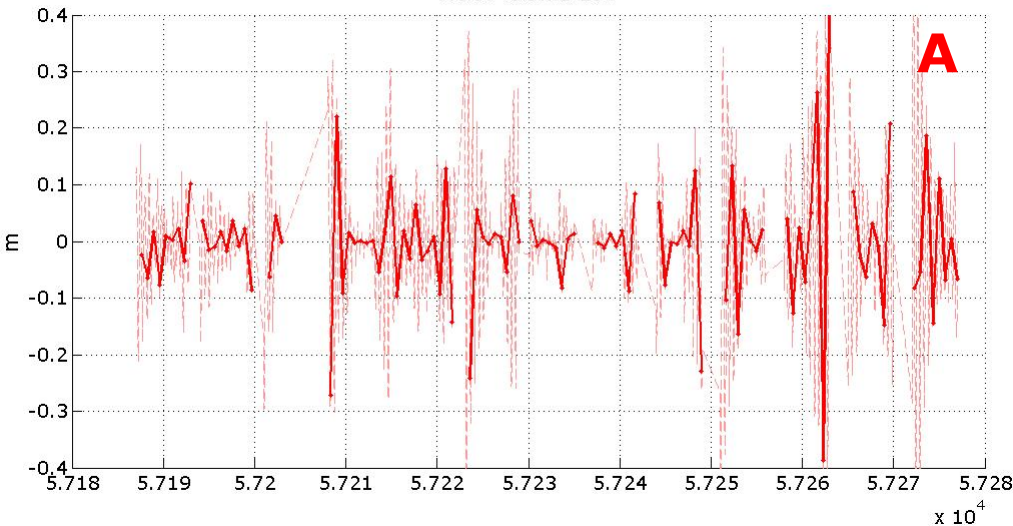
NSGF-COMB L54



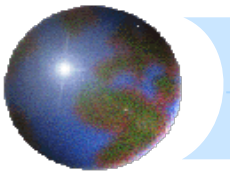
NSGF-COMB L54



NSGF-COMB L54



	MEAN [mm]	STD [mm]
R	0.5	20.2
A	6.6	119.0
C	-10.6	72.0



Next steps

- Check JCET and GRGS orbit solutions;
- Produce weekly combined orbit files;
- Produce sum files;
- Evaluate the quality and stability of this solution.