Comparison between post-aluminisation measurements from two samples of CT7 and GTC-IRIS, along with historical SMS measurements

Conclusions: reflectivity measurements from ING-CT7 after firmware update in July 2013 agree closely with GTC IRIS
Between first use in March 2012 and firmware update, %R values in 4 bands need correction, by max 5% in extreme bands.
The variances of CT7 samples on fresh aluminium are almost half those of GTC-IRIS. Scattering estimate from CT7 is double that from IRIS.
Long term (several years) variation in CT7 reference measurements is 0.1 to 0.3%, probably due to temperature.
Historical %R from SMS is 1.5% lower than IRIS or CT7, maybe because wavelength is closer to aluminium absorption at 720nm.
SMS %R average appears to have dropped 2% more in 2012. Equivalent scattering values from SMS are historically much more variable than IRIS sample.

GTC-IRIS after WHT M1 aluminisation, 7 Feb 2012. First measurement is "calibration" - ignore here

		B	B	R	IR	TIS%	Di+2	Di-45	Di-15
		470	530	650	880				
1	at 45 deg	90.68	90.20	89.10	87.66	0.53	1.51E-01	3.81E-04	5.91E-03
	at 90 deg	91.14	90.68	89.63	88.24				
2	45 deg	90.68	90.13	89.19	87.64	0.34	8.54E-02	2.74E-04	3.90E-03
	90 deg	91.14	90.62	89.71	88.22				
3	45 deg	90.67	90.07	89.41	87.61	0.39	1.25E-01	2.64E-04	4.23E-03
	90 deg	91.14	90.56	89.93	88.2				
4	45 deg	90.25	89.3	88.83	87.33	0.28	5.39E-02	2.10E-04	3.72E-03
	90 deg	90.73	89.82	89.37	87.92				
5	45 deg	90.71	90.19	89.26	87.55	0.39	1.21E-01	2.70E-04	4.29E-03
		91.17	90.67	89.78	88.14				
6	45 deg	90.67	90.13	89.08	87.55	0.39	1.43E-01	2.80E-04	4.00E-03
		91.14	90.62	89.6	88.14				
7	45 deg	90.73	89.99	89.4	87.48	0.39	9.72E-02	3.52E-04	4.50E-03
		91.19	90.48	89.91	88.07				

8	45 deg	90.73	90.16	89.34	87.55	0.37	8.67E-02	2.91E-04	4.43E-03
		91.19	90.64	89.85	88.13				
Average of 8	45 deg	90.64	90.02	89.20	87.55	0.39	1.08E-01	**2.90E-04**	4.37E-03
Std dev		0.16	0.30	0.20	0.10	0.07	3.28E-02	5.34E-05	6.76E-04
	90 deg	91.10	90.50	89.72	88.12				
		0.16	0.31	0.20	0.10				
Other aluminizations:									
		91.2	91.2	90.3	87.7	0.5			
Difference of CT7-GTS_IRIS		**0.10**	**0.70**	**0.58**	**-0.42**				
ING-CT7 on WHTM1 Alum 2016		91.0	91.0	90.1	87.3				
ING-CT7 on INT M1 Alum 2012		91.10	89.50	88.30	**82**	note: values corrected following reference surface measurements			

		B	G	R	IR	
LT-IRIS on LT M1		92.02	90.47	89.45	82.9	1.84E-04
		92.09	90.63	89.55	82.67	1.36E-04
		91.87	90.42	89.44	82.62	2.06E-04
	average	91.99	90.51	89.48	82.73	1.75E-04
difference of GTC-LT IRISes		**-0.89**	**-0.01**	**0.24**	**5.39**	1.15E-04

Post Aluminisation from SMS

WHT M3	Mar-13	86.0	2.73E-03
INT M1	Jan-12	86.4	1.97E-05
WHT M1	Nov-09	87.9	5.10E-03
INT M1	Apr-08	87.2	6.14E-03
WHT M1	Jan-07	88.5	8.51E-05
WHT M1	Nov-04	87.1	1.40E-04
WHT M1	Jun-00	88.1	9.96E-05
WHT M2	Oct-00	87.7	8.10E-05

CT7 measurements on fresh and aged aluminium

				Tempr. °C	wavelength of band (nm)							"Dust Indices"						
Liverpool finder post aluminization					365	404	464	522	624	760	970	365	404	464	522	624	760	970
476	24/06/2015 10:13	0	LT fresh Alu	21.4	93.4	91.7	91.2	91.2	90.2	87.6	93.6	0.7	0.6	0.5	0.4	0.4	0.3	0.4
477	24/06/2015 10:15	0	LT fresh Alu	21.5	93.4	91.7	91.2	91.2	90.2	87.5	93.5	0.7	0.6	0.6	0.4	0.5	0.4	0.4
LT-IRIS on LT M1 fresh							92.0	91.0	89.7	82.3								
Nordic M1 mirror measurements follow																		
478	24/06/2015 13:18	0	Normal	21.6	89.1	88.2	88.7	89	88.3	85.7	91.7	4.7	4	3.6	2.9	3.1	2.5	2.7
479	24/06/2015 13:21	0	Normal	21.6	91	89.6	89.6	89.7	88.8	86.2	92	2.4	2.3	2.2	2	2.1	2	2.2
480	24/06/2015 13:22	0	Normal	21.7	91.9	90.4	90.2	90.3	89.3	86.5	92.4	2.1	1.9	2.1	1.5	1.9	1.6	1.8
481	24/06/2015 13:25	0	Normal	21.9	90.8	89.4	89.4	89.6	88.7	86	91.9	5.3	4.7	4.2	3.3	3.4	2.9	2.9
482	24/06/2015 13:26	0	Normal	22.1	90.5	88.6	88.8	88.5	88.3	85.3	91	5.8	6.5	6.2	5.6	4.6	4.7	4.3
Averages					90.7	89.2	89.3	89.4	88.7	85.9	91.8							
NOT old sample mirrors																		
483	24/06/2015 13:35	0	error	21.6	3.2	3.4	4	3.2	5.7	3	3.4	31	55.3	55.5	52.5	27.2	22.5	38.1
484	24/06/2015 13:36	0	old samp1	21.6	93.4	91.7	91.3	91.3	90.3	87.5	93	0.7	0.6	0.5	0.5	0.5	0.4	0.6
485	24/06/2015 13:37	0	old samp2	21.7	93.7	91.9	91.4	91.5	90.4	87.6	93.1	0.4	0.3	0.2	0.2	0.2	0.2	0.5
486	24/06/2015 13:38	0	old samp3	21.9	93.3	91.6	91.1	91.2	90.2	87.4	92.9	0.8	0.7	0.7	0.6	0.6	0.5	0.7
487	24/06/2015 13:39	0	old samp4	22	93.6	91.9	91.4	91.4	90.4	87.5	93.1	0.4	0.3	0.3	0.2	0.3	0.3	0.5
					91.44	89.94	90.14	90.06	89.19	85.89	92.30							
next day checks:																		
Reference mirror 1				21.8	84.7	83.6	88.5	90.7	89.6	83.3	86.6							
Reference mirror 2				22	84.5	83.5	88.4	90.6	89.6	83.3	86.5							
Reference mirror 2				22.2	84.5	83.5	88.3	90.6	89.5	83.2	86.5							