

Monitoring Reflectance and Scattering of WHT Primary Mirror

Neil O'Mahony performed cleaning, processed data and wrote this report.			
Dome Humidity 22-28%. Flakes stuck before falling, some condensation. New CO2 bottle, 93 kg.			
Published 24 June 2010			
Lambda	0.67		
Incident Angle	25		
Bandwidth Limits	1	0.01	

SMS μ Scan Measurements from BEFORE CO2 cleaning of WHT primary

	BDSF (Scattering)		REFLECTANCE	Notes	Surface Roughness RMS (Å)	TIME	DATE
	Pos 1: Zenith 0° Azim. 0°	Pos 2: Zenith 50° Azim. 180°					
Ref mirror	3.13E-003	1.91E-003	0.914		39	10:12:32	06-23-2010
2	3.14E-003	1.92E-003	0.914	couplet avg	39	10:12:37	06-23-2010
3	3.14E-003	1.92E-003	0.914	0.914	39	10:12:42	06-23-2010
4	7.37E-003	3.64E-003	0.911		60.4	10:12:49	06-23-2010
5	7.38E-003	3.65E-003	0.910	0.911	60.4	10:12:54	06-23-2010
6	7.32E-003	3.60E-003	0.912		60.2	10:12:59	06-23-2010
7	1.63E-002	2.94E-003	0.912		106.2	10:13:07	06-23-2010
8	1.64E-002	3.06E-003	0.913	0.913	105.5	10:13:12	06-23-2010
9	6.03E-003	3.75E-003	0.906		54.3	10:13:18	06-23-2010
10	6.18E-003	3.80E-003	0.907	0.907	54.9	10:13:23	06-23-2010
11	5.80E-003	2.93E-003	0.916		53.3	10:13:32	06-23-2010
12	5.80E-003	2.93E-003	0.916	0.916	53.4	10:13:36	06-23-2010
13	9.56E-003	3.09E-003	0.909		71.6	10:13:42	06-23-2010
14	9.02E-003	2.94E-003	0.908	0.909	69.5	10:13:47	06-23-2010
15	8.62E-003	2.94E-003	0.909		67.5	10:13:51	06-23-2010
16	1.79E-003	1.32E-003	0.911	0.910	29.5	10:13:58	06-23-2010
Reference mirror reflectance check			0.911	0.911			
Primary mir	5.53E-003	2.22E-003	0.849		55	10:26:22	06-23-2010
18	5.54E-003	2.22E-003	0.848	too high	55	10:26:28	06-23-2010
19	5.08E-003	2.19E-003	0.842		52.6	10:26:40	06-23-2010
20	5.16E-003	2.24E-003	0.842		53	10:26:45	06-23-2010
21	6.64E-003	3.03E-003	0.842	Skip all	59.9	10:26:57	06-23-2010
22	6.65E-003	3.04E-003	0.843	av right (1)	59.9	10:27:02	06-23-2010
23	9.01E-003	4.12E-003	0.808	0.844	71.2	10:28:01	06-23-2010
24	9.02E-003	4.12E-003	0.808		71.2	10:28:06	06-23-2010
25	7.33E-003	2.21E-003	0.813		66.9	10:28:16	06-23-2010
26	7.33E-003	2.21E-003	0.814		66.8	10:28:20	06-23-2010
27	5.12E-003	1.89E-003	0.814		54.5	10:28:31	06-23-2010
28	5.12E-003	1.89E-003	0.815	av bottom(2)	54.4	10:28:36	06-23-2010
29	7.00E-003	2.05E-003	0.813	0.812	65.7	10:30:06	06-23-2010
30	7.00E-003	2.05E-003	0.814		65.6	10:30:11	06-23-2010
31	8.62E-003	5.05E-003	0.788		69.7	10:30:21	06-23-2010
32	8.61E-003	5.11E-003	0.787		69.7	10:30:27	06-23-2010
33	7.83E-003	5.45E-003	0.800		65.7	10:30:37	06-23-2010
34	7.76E-003	5.43E-003	0.799	av left (3)	65.5	10:30:43	06-23-2010
35	5.84E-003	2.89E-003	0.817	0.800	56.8	10:30:55	06-23-2010
36	5.86E-003	2.88E-003	0.815		56.9	10:31:03	06-23-2010
37	5.62E-003	2.07E-003	0.824		56.7	10:32:01	06-23-2010

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38	5.62E-003	2.07E-003	0.824		56.7
39	6.49E-003	3.00E-003	0.818		60
40	6.49E-003	3.00E-003	0.818		60
41	5.35E-003	2.98E-003	0.822	0.820	53.9
42	5.36E-003	2.99E-003	0.821	av top (4)	53.9
43	2.00E-002	1.92E-002	0.734	bad spot	109.8
44	1.99E-002	1.92E-002	0.733	skip	109.6
45	1.30E-002	1.10E-002	0.798	skip	84.7
46	1.30E-002	1.11E-002	0.799	near spot	84.6
47	1.46E-002	1.27E-002	0.783	skip	90.8
48	1.46E-002	1.27E-002	0.783	near spot	90.8
49	1.19E-002	8.49E-003	0.794	skip	81.3
50	1.19E-002	8.53E-003	0.793	skip	81.3
51	8.30E-003	3.86E-003	0.814	rt again	68
52	8.31E-003	3.85E-003	0.815		68
53	4.77E-003	1.45E-003	0.830		53.4
54	4.77E-003	1.44E-003	0.832		53.3
55	4.00E-003	1.28E-003	0.831		48.5
56	4.00E-003	1.27E-003	0.831	use these	48.5
57	7.41E-003	3.07E-003	0.818	no pair	64.6

10:32:07	06-23-2010
10:32:17	06-23-2010
10:32:23	06-23-2010
10:32:31	06-23-2010
10:32:37	06-23-2010
10:32:46	06-23-2010
10:32:52	06-23-2010
10:33:02	06-23-2010
10:33:08	06-23-2010
10:33:18	06-23-2010
10:33:23	06-23-2010
10:34:21	06-23-2010
10:34:27	06-23-2010
10:34:38	06-23-2010
10:34:43	06-23-2010
10:34:53	06-23-2010
10:34:59	06-23-2010
10:35:09	06-23-2010
10:35:14	06-23-2010
10:35:25	06-23-2010

Averages	6.44E-003	2.87E-003	81.493	%	60.05
Std errors % (±)	5.6	10.3	0.318	%	

Ref mirror	2.07E-003	1.22E-003	0.913		31.7
59	2.07E-003	1.22E-003	0.912		31.8
60	2.07E-003	1.22E-003	0.911		31.7
61	2.29E-003	1.79E-003	0.909		33.3
62	2.29E-003	1.78E-003	0.908		33.3
63	4.60E-003	1.84E-003	0.893		48.9
64	5.05E-003	1.83E-003	0.891		51.8
65	2.63E-003	1.42E-003	0.899		36.2
66	2.55E-003	1.38E-003	0.899		35.6
67	3.28E-003	1.47E-003	0.907		40.6
68	3.03E-003	1.51E-003	0.909		38.7
69	2.51E-003	1.75E-003	0.904		35

10:40:29	06-23-2010
10:40:34	06-23-2010
10:40:39	06-23-2010
10:40:47	06-23-2010
10:40:52	06-23-2010
10:41:00	06-23-2010
10:41:04	06-23-2010
10:41:12	06-23-2010
10:41:17	06-23-2010
10:41:25	06-23-2010
10:41:30	06-23-2010
10:41:38	06-23-2010

Reference mirror reflectance check **0.905**

70	1.76E-003	2.42E-003	0.897	skip	29.8
71	1.76E-003	2.43E-003	0.898	skip	29.8
72	1.39E-003	1.15E-003	0.878	skip	26.5
73	1.40E-003	1.15E-003	0.877	skip	26.5
74	7.81E-003	2.90E-003	0.897	skip	64
new file	2.28E-003	1.00E-003	0.882	skip	34.4
2	2.28E-003	1.00E-003	0.882	skip	34.4
3	1.52E-003	1.25E-003	0.916	Air blower	27
4	1.52E-003	1.25E-003	0.917		27
5	2.77E-003	1.81E-003	0.903		36.8
6	2.77E-003	1.81E-003	0.903		36.8
7	2.44E-003	1.59E-003	0.919		34.2
8	2.44E-003	1.59E-003	0.919		34.3
9	3.55E-003	1.52E-003	0.921		42.1
10	3.54E-003	1.49E-003	0.919		42.1
11	4.60E-003	2.24E-003	0.907		47.9
12	5.42E-003	2.47E-003	0.906		52.2

14:58:11	06-23-2010
14:58:17	06-23-2010
14:58:25	06-23-2010
14:58:30	06-23-2010
14:58:37	06-23-2010
15:02:51	06-23-2010
15:02:57	06-23-2010
15:03:18	06-23-2010
15:03:23	06-23-2010
15:03:30	06-23-2010
15:03:35	06-23-2010
15:03:43	06-23-2010
15:03:48	06-23-2010
15:03:55	06-23-2010
15:03:59	06-23-2010
15:04:06	06-23-2010
15:04:11	06-23-2010

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13	1.48E-003	8.81E-004	0.912		26.8
14	1.53E-003	9.07E-004	0.914		27.2
15	5.17E-003	2.82E-003	0.903		50.6

15:04:18	06-23-2010
15:04:23	06-23-2010
15:04:30	06-23-2010

Reference mirror reflectance check

0.912

Measurements from AFTER CO2 cleaning of WHT primary

Primary mirror	4.42E-003	9.66E-004	0.820		55.1
17	4.41E-003	9.65E-004	0.821		55.1
18	4.36E-003	8.69E-004	0.817		56.3
19	4.36E-003	8.68E-004	0.817		56.3
20	2.82E-003	5.13E-004	0.825		46.4
21	2.82E-003	5.13E-004	0.827	right	46.3
22	3.74E-003	7.45E-004	0.822		52
23	3.74E-003	7.49E-004	0.822		51.9
24	4.72E-003	1.30E-003	0.827		54.1
25	4.71E-003	1.30E-003	0.825		54
26	5.31E-003	1.30E-003	0.817		59
27	5.32E-003	1.30E-003	0.818	bottom	59
28	6.06E-003	1.33E-003	0.821		64.5
29	6.06E-003	1.33E-003	0.820		64.5
30	7.27E-003	1.67E-003	0.812		70.2
31	7.29E-003	1.67E-003	0.812		70.4
32	3.49E-003	8.41E-004	0.828		47.6
33	3.49E-003	8.41E-004	0.828	left	47.6
34	4.51E-003	9.65E-004	0.823		55.9
35	4.51E-003	9.62E-004	0.823		56
36	3.51E-003	7.09E-004	0.828		50
37	3.51E-003	7.14E-004	0.830		49.8
38	3.48E-003	7.18E-004	0.828		49.5
39	3.48E-003	7.18E-004	0.829	top	49.4
40	3.94E-003	7.34E-004	0.828	rt again?	54.3
41	3.94E-003	7.33E-004	0.828		54.3
42	4.06E-003	7.51E-004	0.822	rt	55.4
43	4.06E-003	7.46E-004	0.823		55.5
44	3.82E-003	7.18E-004	0.822		53.5
45	3.82E-003	7.17E-004	0.822		53.5
46	4.67E-003	9.79E-004	0.834	skip	56.9

15:14:26	06-23-2010
15:14:31	06-23-2010
15:14:40	06-23-2010
15:14:45	06-23-2010
15:14:53	06-23-2010
15:14:58	06-23-2010
15:15:09	06-23-2010
15:15:14	06-23-2010
15:16:17	06-23-2010
15:16:21	06-23-2010
15:16:34	06-23-2010
15:16:39	06-23-2010
15:16:47	06-23-2010
15:16:52	06-23-2010
15:17:00	06-23-2010
15:17:05	06-23-2010
15:17:57	06-23-2010
15:18:01	06-23-2010
15:18:10	06-23-2010
15:18:14	06-23-2010
15:18:22	06-23-2010
15:18:27	06-23-2010
15:18:35	06-23-2010
15:18:39	06-23-2010
15:19:24	06-23-2010
15:19:29	06-23-2010
15:19:38	06-23-2010
15:19:43	06-23-2010
15:19:52	06-23-2010
15:19:56	06-23-2010
15:20:04	06-23-2010

Averages 4.47E-003 9.95E-004 82.283 % 54.98

Std errors % (±) 6.4 8.1 0.125 %

Improvement 1.44 2.89 0.791 % 1.09

47	4.98E-003	1.62E-003	0.900		51.8
48	4.99E-003	1.62E-003	0.900		51.9
49	3.19E-003	2.06E-003	0.896		39.7
50	3.19E-003	2.06E-003	0.897		39.7
51	2.36E-003	1.45E-003	0.909		34
52	2.29E-003	1.41E-003	0.909		33.4
53	2.74E-003	9.09E-004	0.905		38.2
54	2.72E-003	9.11E-004	0.903		38.1
55	8.21E-003	5.06E-003	0.890		63.9
56	8.23E-003	5.06E-003	0.891		64
57	3.37E-003	2.19E-003	0.912	skip	40.4

15:24:30	06-23-2010
15:24:35	06-23-2010
15:24:42	06-23-2010
15:24:47	06-23-2010
15:24:54	06-23-2010
15:24:59	06-23-2010
15:25:06	06-23-2010
15:25:11	06-23-2010
15:25:16	06-23-2010
15:25:21	06-23-2010
15:25:27	06-23-2010

Reference mirror reflectance check

0.900