

Measurements of WHT Primary during stand-down, in preparation for possible washing or aluminizing  
 Note: the telescope was no longer exposed to the weather, or dust, from 16 April, when Stand-down began.

|   |                  |   |          | Tempr.<br>°C | Reflectivity (%R)<br>wavelength of band (nm) |      |      |      |      |      |      | "Dust Indices" (DI) |      |      |      |      |      |      |
|---|------------------|---|----------|--------------|--|------|------|------|------|------|------|---------------------|------|------|------|------|------|------|
|   |                  |   |          |              | 365  | 404  | 464  | 522  | 624  | 760  | 970  | 365                 | 404  | 464  | 522  | 624  | 760  | 970  |
| Before STd-dwn,Only 4, ran out of batte |                  |   |          |              |  |      |      |      |      |      |      |                     |      |      |      |      |      |      |
| 1384                                    | 04/04/2018 13:59 | 1 | WHTM1 al | 14.8         | 85.9   | 84.4 | 84.1 | 84.1 | 83.9 | 81.1 | 87.2 | 12.2                | 12.5 | 13.0 | 11.2 | 11.9 | 11.2 | 11.7 |
| 1385                                    | 04/04/2018 14:00 | 1 | WHTM1 al | 14.9         | 86.2   | 84.8 | 84.5 | 84.7 | 84.0 | 81.6 | 87.6 | 11.5                | 11.7 | 12.1 | 10.0 | 11.4 | 10.1 | 10.4 |
| 1386                                    | 04/04/2018 14:01 | 1 | WHTM1 al | 15.2         | 85.6   | 84.2 | 84.2 | 84.0 | 83.9 | 81.2 | 86.8 | 12.5                | 12.6 | 12.8 | 10.9 | 11.9 | 10.8 | 11.1 |
| 1387                                    | 04/04/2018 14:02 | 1 | WHTM1 al | 15.4         | 86.2   | 84.8 | 84.3 | 84.8 | 83.9 | 81.6 | 87.6 | 12.0                | 12.0 | 12.9 | 10.1 | 11.9 | 10.5 | 10.6 |
| averages                                |                  |   |          |              | 86.0   | 84.6 | 84.3 | 84.4 | 83.9 | 81.4 | 87.3 | 12.1                | 12.2 | 12.7 | 10.6 | 11.8 | 10.7 | 11.0 |

Measurements during stand-down  
 WHT M1, @ port holes, usual order

|          |                  |   |            |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------|------------------|---|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1391     | 30/04/2018 13:38 | 1 | left       | 22.8 | 85.3 | 83.9 | 83.4 | 84.0 | 83.0 | 80.7 | 87.0 | 13.2 | 13.1 | 14.0 | 11.3 | 13.3 | 11.7 | 11.8 |
| 1392     | 30/04/2018 13:39 | 1 | left       | 22.7 | 85.4 | 84.1 | 83.9 | 84.0 | 83.4 | 81.0 | 86.9 | 13.1 | 12.8 | 13.4 | 11.3 | 12.8 | 11.5 | 11.9 |
| 1393     | 30/04/2018 13:40 | 1 | left       | 22.6 | 85.4 | 83.9 | 83.7 | 83.8 | 83.4 | 80.7 | 86.8 | 12.9 | 12.9 | 13.5 | 11.3 | 12.6 | 11.5 | 11.6 |
| 1394     | 30/04/2018 13:42 | 1 | top        | 22.5 | 85.4 | 83.8 | 83.7 | 83.7 | 83.4 | 80.6 | 87.0 | 12.8 | 13.0 | 14.0 | 11.5 | 12.7 | 11.8 | 11.2 |
| 1395     | 30/04/2018 13:43 | 1 | top        | 22.4 | 85.8 | 84.7 | 84.3 | 85.0 | 83.8 | 81.9 | 87.8 | 12.5 | 11.9 | 12.6 | 9.9  | 11.9 | 9.8  | 10.0 |
| 1396     | 30/04/2018 13:43 | 1 | top        | 22.3 | 85.5 | 84.5 | 84.7 | 84.5 | 84.0 | 81.7 | 87.4 | 13.2 | 12.4 | 12.3 | 10.4 | 12.0 | 10.0 | 10.6 |
| 1397     | 30/04/2018 13:45 | 1 | right      | 22.3 | 86.7 | 85.7 | 85.2 | 85.4 | 84.5 | 82.1 | 88.0 | 10.5 | 10.3 | 11.2 | 9.1  | 10.6 | 9.5  | 9.8  |
| 1398     | 30/04/2018 13:45 | 1 | right      | 22.1 | 84.7 | 83.6 | 83.1 | 83.4 | 82.2 | 80.1 | 85.6 | 13.2 | 13.2 | 14.6 | 11.9 | 15.1 | 13.4 | 14.2 |
| 1399     | 30/04/2018 13:46 | 1 | rep right  | 22.1 | 85.0 | 83.5 | 82.8 | 83.5 | 82.3 | 79.7 | 85.8 | 12.7 | 12.8 | 14.4 | 11.7 | 14.7 | 13.5 | 13.6 |
| 1400     | 30/04/2018 13:47 | 1 | right      | 22   | 86.6 | 85.2 | 84.7 | 85.0 | 84.2 | 81.7 | 87.6 | 11.0 | 10.9 | 11.9 | 9.7  | 11.1 | 10.0 | 10.1 |
| 1401     | 30/04/2018 13:49 | 1 | bottom     | 21.8 | 86.0 | 84.6 | 84.1 | 84.3 | 83.9 | 81.2 | 87.5 | 12.7 | 12.7 | 13.5 | 10.8 | 12.3 | 11.1 | 11.1 |
| 1402     | 30/04/2018 13:49 | 1 | bottom     | 21.7 | 84.0 | 82.7 | 82.5 | 82.8 | 81.8 | 79.2 | 85.1 | 13.8 | 13.8 | 15.1 | 12.4 | 15.2 | 13.8 | 14.2 |
| 1403     | 30/04/2018 13:50 | 1 | rep bottor | 21.6 | 83.4 | 82.1 | 81.8 | 81.9 | 81.0 | 78.7 | 84.1 | 14.9 | 15.1 | 16.6 | 13.9 | 16.9 | 15.4 | 16.3 |
| 1404     | 30/04/2018 13:51 | 1 | bottom     | 21.6 | 85.8 | 84.5 | 84.1 | 84.7 | 83.6 | 81.3 | 87.4 | 12.3 | 11.9 | 12.8 | 10.1 | 12.1 | 10.6 | 10.5 |
| averages |                  |   |            |      | 85.4 | 84.1 | 83.7 | 84.0 | 83.2 | 80.8 | 86.7 | 12.8 | 12.6 | 13.6 | 11.1 | 13.1 | 11.7 | 11.9 |

Note the scattering values above, similar to those measured before the CO2 cleaning in December, are close to the limit above which %R is less accurate according to the usage instructions for the reflectometer.

Note the worst values above, both verified by repetition at nearby location, were found on the mirror-center side of the porthole, but at only ~20 cm distance from locations with better values. Implies there may be large areas that are worse affected, or patchy cleaning last time.

|                                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| worst values                   | 83.4 | 82.1 | 81.8 | 81.9 | 81.0 | 78.7 | 84.1 |      |      |      |      |      |      |      |  |
| difference from average        | -2.0 | -2.0 | -1.9 | -2.1 | -2.2 | -2.1 | -2.6 | 14.9 | 15.1 | 16.6 | 13.9 | 16.9 | 15.4 | 16.3 |  |
| best values                    | 86.7 | 85.7 | 85.2 | 85.4 | 84.5 | 82.1 | 88.0 | 10.5 | 10.3 | 11.2 | 9.1  | 10.6 | 9.5  | 9.8  |  |
| average ignoring both extremes | 85.7 | 84.4 | 84.2 | 84.4 | 83.7 | 81.3 | 87.3 | 12.6 | 12.3 | 13.0 | 10.6 | 12.2 | 10.8 | 10.9 |  |

Note these values are worse than any of the 4 taken 2 weeks previously, typical of the rate of dust gathering

Change since last cleaning, December 2017: -2.8 -2.9 -2.7 -2.7 -2.6 -2.5 -2.4 2.9 3.0 3.2 2.9 3.4 3.2 3.2

Conclusion: Reflectivity has decreased by more than half the increase caused by the previous CO2 cleaning, 5 months ago. Not too bad, but needs cleaning soon.

| Reference Surface                   |      | 365  | 404  | 464  | 522  | 624  | 760  | 970  | 365 | 404 | 464 | 522 | 624 | 760 | 970 |
|-------------------------------------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| 1407 30/04/2018 14:40 20 Gauge      | 21.1 | 84.7 | 83.9 | 88.5 | 90.6 | 89.6 | 83.5 | 87.2 | 2.5 | 3   | 2.5 | 1.4 | 1.1 | 0.9 | 1.1 |
| 1408 30/04/2018 14:42 20 Gauge      | 21.4 | 84.6 | 83.7 | 88.3 | 90.5 | 89.5 | 83.4 | 87.1 | 2.7 | 3.3 | 2.8 | 1.7 | 1.3 | 1   | 1.3 |
| Last previous reference measurement |      |      |      |      |      |      |      |      |     |     |     |     |     |     |     |
| 1215 06/10/2017 11:47 20 Gauge      | 26.8 | 84.8 | 83.9 | 88.6 | 90.7 | 89.6 | 83.4 | 87.3 | 2.4 | 3   | 2.5 | 1.5 | 1.1 | 0.9 | 1.1 |
| stabililty of Reference             |      | 0.1  | 0    | 0.1  | 0.1  | 0    | -0.1 | 0.1  |     |     |     |     |     |     |     |