

Reflectivity measmts. of WHT Nasmyth Flat (M3) from SMS and CT7 after CO2 cleaning on 8 July 2014, following strong calima event 1 week previously.

SMS measmts. usually in pairs to check 0.05% repeatable. Usual reference mirror.

Measurements, CO2 cleaning and and Report by Neil.

| datum #               | Scattering at angles $\Theta, \Phi$ |                 |                 | Reflect-<br>ivity | user<br>comm-<br>ent | Rough-<br>ness<br>RMS(Å) | TIME     | DATE       |
|-----------------------|-------------------------------------|-----------------|-----------------|-------------------|----------------------|--------------------------|----------|------------|
|                       | $\Theta$ s-><br>$\Phi$ s->          | 0<br>0          | 50<br>180       |                   |                      |                          |          |            |
| 123                   | bottom r                            | 4.57E-03        | 1.45E-03        | 0.834             |                      | 51.8                     | 10:05:59 | 07-16-1914 |
| 124                   |                                     | 4.58E-03        | 1.45E-03        | 0.831             |                      | 51.9                     | 10:06:04 | 07-16-1914 |
| 125                   | bottom l                            | 6.72E-03        | 2.77E-03        | 0.819             |                      | 61.6                     | 10:06:39 | 07-16-1914 |
| 126                   |                                     | 6.72E-03        | 2.77E-03        | 0.821             |                      | 61.5                     | 10:06:44 | 07-16-1914 |
| 127                   | near stain                          | 3.30E-03        | 9.41E-04        | 0.837             |                      | 44.6                     | 10:07:18 | 07-16-1914 |
| 128                   |                                     | 3.30E-03        | 9.42E-04        | 0.84              |                      | 44.5                     | 10:07:24 | 07-16-1914 |
| 131                   | off-centre                          | 2.32E-03        | 7.71E-04        | 0.837             |                      | 36.6                     | 10:17:26 | 07-16-1914 |
| 132                   |                                     | 2.33E-03        | 7.75E-04        | 0.837             |                      | 36.7                     | 10:17:31 | 07-16-1914 |
| <b>Averages</b>       |                                     | <b>4.23E-03</b> | <b>1.48E-03</b> | <b>0.832</b>      |                      | <b>48.7</b>              |          |            |
| <b>std deviations</b> |                                     | <b>1.76E-03</b> | <b>8.37E-04</b> | <b>0.008</b>      |                      | <b>9.8</b>               |          |            |
| <b>std error</b>      |                                     |                 |                 | <b>0.004</b>      |                      |                          |          |            |

|     | Scattering |          | %R    |      | RMS                 |
|-----|------------|----------|-------|------|---------------------|
| 129 | 1.12E-03   | 9.57E-04 | 0.936 | 23   | 10:16:49 07-16-1914 |
| 130 | 1.13E-03   | 9.63E-04 | 0.936 | 23.1 | 10:16:54 07-16-1914 |

Reference measmts. (above) show SMS had correct sensitivity (>93.5%) during M3 meas.

**CT7 measurements on WHT Nasmyth flat (M3) 5 days after CO2 cleaning and water spray (local)**  
**Some 5 or 6 water stains with dust mixed in (~5 mm diam.) were not reducible.**

**CT7 Reflectivity measurements (%R)**

|                                   |                  |              |      | Tempr.<br>°C | wavelength of band (nm) |      |      |      |      |      |      | mean<br>over 7<br>bands |
|-----------------------------------|------------------|--------------|------|--------------|-------------------------|------|------|------|------|------|------|-------------------------|
|                                   |                  |              |      |              | 365                     | 404  | 464  | 522  | 624  | 760  | 970  |                         |
| 233                               | 16/07/2014 10:10 | 0 bottom r   | 17.6 | 91.7         | 87.3                    | 89.9 | 88.3 | 87.2 | 86.4 | 90.4 | 88.7 |                         |
| 234                               | 16/07/2014 10:11 | 0 bottom l   | 17.6 | 91.4         | 87.2                    | 89.7 | 88.2 | 87   | 86.2 | 89.9 | 88.5 |                         |
| 235                               | 16/07/2014 10:11 | 0 centre     | 17.8 | 91.7         | 87.3                    | 90   | 88.4 | 87.3 | 86.4 | 90.4 | 88.8 |                         |
| 236                               | 16/07/2014 10:12 | 0 near stain | 17.9 | 91.3         | 87.3                    | 89.9 | 88.4 | 87.3 | 86.4 | 90.2 | 88.7 |                         |
| averages                          |                  |              |      | 91.5         | 87.3                    | 89.9 | 88.3 | 87.2 | 86.4 | 90.2 | 88.7 |                         |
| M1 mean values after CO2 cleaning |                  |              |      | 90.9         | 87.2                    | 90.2 | 89.1 | 87.8 | 87.0 | 90.7 | 89.0 |                         |
| difference M3-M1                  |                  |              |      | 0.7          | 0.1                     | -0.3 | -0.8 | -0.6 | -0.7 | -0.5 | -0.3 |                         |

**Reference measurements before and after M3**

|                                              |                  |         |      |             |             |             |             |             |             |             |  |
|----------------------------------------------|------------------|---------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
|                                              | 14/07/2014 13:53 | 0 Gauge | 22.1 | 85.3        | 82.5        | 89.8        | 90.5        | 89.0        | 84.5        | 86.5        |  |
| 237                                          | 16/07/2014 13:27 | 0 Gauge | 21.4 | 85.2        | 82.0        | 89.5        | 90.2        | 88.8        | 84.4        | 86.3        |  |
| 238                                          | 16/07/2014 13:27 | 0 Gauge | 21.6 | 85.0        | 81.9        | 89.4        | 90.0        | 88.7        | 84.4        | 86.3        |  |
| <b>Change in reference since M1 measmts.</b> |                  |         |      | <b>0.20</b> | <b>0.55</b> | <b>0.35</b> | <b>0.40</b> | <b>0.25</b> | <b>0.10</b> | <b>0.20</b> |  |

**Conclusion: M3 appears to have slightly lower reflectivity than M1 following CO2 cleaning.**  
**Change in reference is significant w.r.t. M1-M3 difference, depending on wavelength.**

**Dust Indices**

|       |     |     |     |     |     |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|
| M3    | 7.8 | 5.5 | 5.7 | 5.3 | 5.4 | 5   | 9.1 |
| M3    | 7.0 | 4.8 | 5.1 | 4.9 | 5.2 | 4.7 | 9.4 |
| M3    | 6.6 | 4.6 | 4.7 | 4.6 | 4.8 | 4.4 | 8.7 |
| M3    | 6.9 | 4.8 | 4.9 | 4.8 | 4.9 | 4.5 | 9.1 |
| gauge | 5.5 | 3.6 | 3.5 | 3.5 | 3.2 | 2.6 | 8.8 |
| gauge | 5.5 | 3.6 | 3.5 | 3.6 | 3.3 | 2.6 | 9.0 |