Appendix **A.1 Description of measurement facility and measurement method**

Laboratory: National Research Council of Canada (NRC)

Indicate whether this table relates to Step 2[] or Step 4[ X ]

If the measurement setup has not changed from Step 2, check here [ ] and the following table does not need to be completed. Otherwise, please fill out the whole table.

Table A-1 Details of Measurement Setup

|  |  |
| --- | --- |
| Make and Type of Spectrophotometer | In-house custom-designed and built (Ref: J.C. Zwinkels and D.S. Gignac, “Design and testing of a new high-accuracy ultraviolet-visible-near-infrared spectrophotometer”, Appl. Opt., **31**, 1557-1567 (1992)) |
| Additional Stray Light Rejection | Fused-silica prism predisperser, minimum monochromator slit height of 7 mm; instrument operated in fully darkened room. |
| Source Drift Monitoring | Automated time-symmetrical measurements of sample and reference (either open beam or calibrated attenuator filter) |
| Source | 200 W tungsten-halogen lamp (Q6.6A/T4/1CL) in a custom-designed and built chimney-type lamp housing. |
| Detector(s) | Custom-designed and built silicon sphere detector, large-area silicon detector (HMT S1337), two different thermoelectrically-cooled (-13±10 C) PMTs used behind a Suprasil quartz diffuser (HMT R928, HMT R6872) |
| Temperature(a) | Temperature controlled laboratory (±0.20 C). Monitoring of filter temperature with a calibrated digital thermometer, Fluke Model 1525-R, mounted in the sample compartment of the Reference Spectrophotometer; range of measured temperatures: 22.40 C – 23.20 C, corrected to 230 C using temperature coefficients for the filters provided by pilot lab. |
| Humidity | 35% – 45% RH |
| Beam Size | 17 mm diameter (using a precision diaphragm mounted in front of the sample wheel) |
| Beam Collimation | Highly collimated; maximum beam divergence: ±0.7º. |
| Measurement Sequence(b) | Typical: At each comparison wavelength, 8 repeat measurements of one to four filters were performed in a time-symmetrical sequence; for each repeat, the 6-position filter wheel sample holder was rotated clock-wise and counter-clockwise with dark signals recorded at the beginning, middle and end of each repeat cycle; the average value of the reference beam signals (open beam or reference attenuator) recorded before and after each individual filter reading was used to calculate the filter transmittance. A minimum of 4 independent measurement runs on different days during ~ two month period with repositioning of filters was used to determine the measurement reproducibility. |
| Bandwidth | (1.0±0.03) nm |

(a) i.e. describe method of temperature monitoring of filters and range of temperatures (b) i.e. describe number of measurements and whether filter orientation with respect to beam changes between measurements.

Description of measuring technique (please include a diagram)

See attached NRC report for schematic diagram of NRC Reference Spectrophotometer.

If any damage, contamination or cleaning of the filters was carried out, please give details.

N/A. It was found that the transmittance of filter --A changed significantly between the Round 1 and Round 2 NRC measurements. However, there was no observable contamination or damage of the filter. Thus, it was measured “as is”, only removing loose dust particle with a gentle jet of dry nitrogen gas (grade: UHP) just prior to measurement.

Signature: Date: