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| **Table A-2i NRC (Step 4)**  **Measurement Results – Final. These data (greyed) are to be removed due to clear evidence of filter instability** | | | | | | | | |
| **BK7, 3.1 mm (Filter Identifier: --A)** | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 0.91166 | 0.91338 | 0.91582 | 0.91747 | 0.91861 | 0.91948 | 0.91991 | 0.92023 |
| Number of Measurements | 5 | 4 | 5 | 5 | 6 | 6 | 4 | 4 |
| Temperature | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Type A Uncertainty(b) | 7.11E-05 | 6.23E-05 | 4.36E-05 | 4.22E-05 | 4.30E-05 | 4.54E-05 | 3.96E-05 | 4.22E-05 |
| Type B Uncertainty(c) | 9.37E-05 | 8.42E-05 | 6.94E-05 | 7.56E-05 | 7.66E-05 | 7.68E-05 | 5.66E-05 | 7.44E-05 |
| Total Uncertainty(d) | 1.18E-04 | 1.05E-04 | 8.19E-05 | 8.66E-05 | 8.78E-05 | 8.92E-05 | 6.91E-05 | 8.55E-05 |
| Eff. Degrees of Freedom | 52 | 56 | 87 | 124 | 122 | 104 | 65 | 118 |

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| **Table A-2i Uncertainty Results - These data (greyed) are to be removed due to clear evidence of filter instability**  All uncertainties are reported as absolute uncertainties. | | | | | | | | | |
| **BK7, 3.1 mm (Filter Identifier: --A)** | | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | Correlation Coefficient(b) |
| Nonlinearity | 1.21E-05 | 1.19E-05 | 1.16E-05 | 1.14E-05 | 1.12E-05 | 1.11E-05 | 1.11E-05 | 1.10E-05 | 1 |
| Wavelength | 1.49E-06 | 5.80E-07 | 2.48E-06 | 4.93E-07 | 5.47E-07 | 6.97E-07 | 2.59E-07 | 9.00E-07 | 1 |
| Stray Light | 8.05E-06 | 7.91E-06 | 7.71E-06 | 7.57E-06 | 7.48E-06 | 7.40E-06 | 7.37E-06 | 7.34E-06 | 1 |
| Beam Size & Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Inter-reflection | 9.20E-05 | 8.23E-05 | 6.72E-05 | 7.36E-05 | 7.47E-05 | 7.50E-05 | 5.42E-05 | 7.25E-05 | 1 |
| Obliquity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Polarization | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1 |
| Source Drift & Fluctuation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bandwidth | 8.17E-08 | 7.23E-08 | 8.08E-10 | 1.81E-09 | 4.14E-09 | 1.37E-08 | 9.28E-09 | 1.47E-08 | 1 |
| Other(b) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total Type B Uncertainty | 9.37E-05 | 8.42E-05 | 6.94E-05 | 7.56E-05 | 7.66E-05 | 7.68E-05 | 5.66E-05 | 7.44E-05 |  |
| Degrees of Freedom |  |  |  |  |  |  |  |  |  |

**Signature:** \_\_\_\_\_\_\_\_\_\_Joanne Zwinkels\_\_\_\_\_\_\_\_\_\_\_ **Date**:\_\_\_\_\_\_April 2, 2015\_\_\_\_\_\_\_\_\_

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| **Table A-2i Measurement Results for NRC (Step 4) - Final** | | | | | | | | |
| **NG 11, 2.5 mm (Filter Identifier: --B)** | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 0.40959 | 0.60959 | 0.62297 | 0.61093 | 0.63829 | 0.57785 | 0.50275 | 0.45440 |
| Number of Measurements | 7 | 8 | 8 | 8 | 6 | 8 | 4 | 5 |
| Temperature | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Type A Uncertainty(b) | 9.75E-05 | 4.35E-05 | 2.53E-05 | 2.31E-05 | 2.63E-05 | 2.58E-05 | 3.50E-05 | 2.50E-05 |
| **Type B Uncertainty(c)** | 1.71E-04 | 5.88E-05 | 5.77E-05 | 6.20E-05 | 6.71E-05 | 7.68E-05 | 7.99E-05 | 6.64E-05 |
| **Total Uncertainty(d)** | 1.97E-04 | 7.31E-05 | 6.30E-05 | 6.62E-05 | 7.21E-05 | 8.10E-05 | 8.72E-05 | 7.10E-05 |
| **Eff. Degrees of Freedom** | 116 | 56 | 270 | 475 | 395 | 680 | 270 | 455 |

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| **Table A-2i Uncertainty Results**  All uncertainties are reported as absolute uncertainties | | | | | | | | | |
| **NG 11, 2.5 mm (Filter Identifier: --B)** | | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | Correlation Coefficient(b) |
| Nonlinearity | 3.63E-05 | 3.57E-05 | 3.52E-05 | 3.57E-05 | 3.46E-05 | 3.66E-05 | 3.75E-05 | 3.72E-05 | 1 |
| Temperature | 3.33E-06 | 2.11E-06 | 2.13E-06 | 2.65E-06 | 1.60E-06 | 1.69E-06 | 2.89E-06 | 3.19E-06 | 0.5 |
| Wavelength | 1.17E-04 | 6.87E-06 | 1.42E-05 | 3.82E-06 | 1.13E-05 | 4.78E-05 | 3.86E-05 | 2.24E-05 | 1 |
| Stray Light | 2.42E-05 | 2.38E-05 | 2.35E-05 | 2.38E-05 | 2.31E-05 | 2.44E-05 | 2.50E-05 | 2.48E-05 | 1 |
| Beam Size & Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Inter-reflection | 8.69E-06 | 3.27E-05 | 3.51E-05 | 4.35E-05 | 4.31E-05 | 7.71E-06 | 6.87E-06 | 1.88E-05 | 1 |
| Obliquity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Polarization | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1.00E-05 | 1 |
| Source Drift & Fluctuation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bandwidth | 1.16E-04 | 1.99E-05 | 5.93E-07 | 1.04E-07 | 1.59E-06 | 1.04E-07 | 1.14E-07 | 2.19E-06 | 1 |
| Filter Instability and Long-term Drift(b) | 0 | 0 | 0 | 0 | 2.6E-05 | 3.9E-05 | 5.2E-05 | 3.8E-05 | 0 |
| Total Type B Uncertainty | 1.71E-04 | 5.88E-05 | 5.77E-05 | 6.20E-05 | 6.71E-05 | 7.68E-05 | 7.99E-05 | 6.64E-05 |  |
| Degrees of Freedom |  |  |  |  |  |  |  |  |  |

**Signature:** \_\_\_\_\_\_\_\_Joanne Zwinkels\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date**:\_\_\_\_\_\_\_\_\_\_\_\_\_April 2, 2015\_\_\_\_

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| **Table A-2i Measurement Results for NRC (Step 4) - Final** | | | | | | | | |
| **NG 5, 3.9 mm (Filter Identifier: --C)** | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 0.02164 | 0.09641 | 0.09290 | 0.07787 | 0.16247 | 0.15123 | 0.10366 | 0.07722 |
| Number of Measurements | 6 | 6 | 7 | 7 | 6 | 6 | 5 | 5 |
| Temperature | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Type A Uncertainty(b) | 4.41E-05 | 2.74E-05 | 1.05E-05 | 7.85E-06 | 2.39E-05 | 1.43E-05 | 1.05E-05 | 4.35E-06 |
| Type B Uncertainty(c) | 8.32E-05 | 7.72E-05 | 5.96E-05 | 2.11E-05 | 8.48E-05 | 4.22E-05 | 2.89E-05 | 1.69E-05 |
| Total Uncertainty(d) | 9.41E-05 | 8.19E-05 | 6.05E-05 | 2.25E-05 | 8.81E-05 | 4.46E-05 | 3.08E-05 | 1.75E-05 |
| Eff. Degrees of Freedom | 146 | 560 | 7721 | 473 | 1292 | 657 | 523 | 1809 |

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| **Table A-2i Uncertainty Results** | | | | | | | | | |
| **NG 5, 3.9 mm (Filter Identifier: --C)**  All uncertainties are reported as absolute uncertainties. | | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | Correlation Coefficient(b) |
| Nonlinearity | 3.18E-06 | 1.31E-05 | 1.26E-05 | 1.08E-05 | 2.04E-05 | 1.93E-05 | 1.39E-05 | 1.07E-05 | 1 |
| Temperature | 7.74E-07 | 1.71E-06 | 1.85E-06 | 1.90E-06 | 1.84E-06 | 1.74E-06 | 2.18E-06 | 1.85E-06 | 0.5 |
| Wavelength | 2.30E-05 | 1.06E-05 | 4.08E-05 | 1.08E-05 | 7.57E-05 | 3.07E-05 | 2.27E-05 | 9.41E-06 | 1 |
| Stray Light | 2.12E-06 | 8.71E-06 | 8.43E-06 | 7.18E-06 | 1.36E-05 | 1.28E-05 | 9.29E-06 | 7.13E-06 | 1 |
| Beam Size & Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Inter-reflection | 7.98E-05 | 7.48E-05 | 4.07E-05 | 1.24E-05 | 2.89E-05 | 1.71E-05 | 5.39E-06 | 3.58E-06 | 1 |
| Obliquity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Polarization | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 3.00E-06 | 3.00E-06 | 3.00E-06 | 4.00E-06 | 1 |
| Source Drift & Fluctuation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bandwidth | 2.63E-05 | 1.10E-05 | 7.42E-07 | 3.49E-07 | 2.64E-06 | 4.83E-08 | 4.28E-08 | 1.46E-07 | 1 |
| Other(b) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total Type B Uncertainty | 8.32E-05 | 7.72E-05 | 5.96E-05 | 2.11E-05 | 8.48E-05 | 4.22E-05 | 2.89E-05 | 1.69E-05 |  |
| Degrees of Freedom |  |  |  |  |  |  |  |  |  |

**Signature:** \_\_\_\_\_\_Joanne Zwinkels\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date**:\_\_\_\_April 2, 2015\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Table A-2i Measurement Results for NRC (Step 4) - Final** | | | | | | | | |
| **NG 4, 3.9 mm (Filter Identifier: --D)** | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 0.0003530 | 0.005139 | 0.008365 | 0.008275 | 0.02634 | 0.03205 | 0.02241 | 0.01658 |
| Number of Measurements | 8 | 7 | 8 | 7 | 7 | 5 | 5 | 5 |
| Temperature | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Type A Uncertainty(b) | 1.56E-06 | 2.57E-06 | 1.42E-06 | 9.89E-07 | 4.77E-06 | 4.25E-06 | 2.48E-06 | 1.66E-06 |
| Type B Uncertainty(c) | 1.35E-06 | 8.44E-06 | 6.02E-06 | 4.85E-06 | 1.84E-05 | 1.06E-05 | 7.72E-06 | 4.66E-06 |
| Total Uncertainty(d) | 2.06E-06 | 8.83E-06 | 6.19E-06 | 4.95E-06 | 1.90E-05 | 1.14E-05 | 8.11E-06 | 4.95E-06 |
| Eff. Degrees of Freedom | 21 | 972 | 2491 | 4381 | 1769 | 362 | 801 | 553 |

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| **Table A-2i Uncertainty Results**  All uncertainties are reported as absolute uncertainties. | | | | | | | | | |
| **NG 4, 3.9 mm (Filter Identifier: --D)** | | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | Correlation Coefficient(b) |
| Nonlinearity | 1.13E-09 | 7.04E-08 | 1.06E-07 | 8.64E-08 | 5.38E-07 | 5.73E-07 | 2.73E-07 | 1.51E-07 | 1 |
| Temperature | 2.94E-08 | 3.55E-07 | 5.05E-07 | 5.46E-07 | 9.98E-07 | 1.05E-06 | 1.25E-06 | 1.02E-06 | 0.5 |
| Wavelength | 7.24E-07 | 1.57E-06 | 2.70E-06 | 2.44E-06 | 1.74E-05 | 4.39E-06 | 4.14E-06 | 5.61E-07 | 1 |
| Stray Light | 7.52E-10 | 4.69E-08 | 7.07E-08 | 5.76E-08 | 3.59E-07 | 3.82E-07 | 1.82E-07 | 1.01E-07 | 1 |
| Beam Size & Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Inter-reflection | 7.51E-07 | 8.24E-06 | 5.36E-06 | 4.15E-06 | 5.89E-06 | 4.59E-07 | 3.07E-06 | 2.26E-06 | 1 |
| Obliquity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Polarization | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Source Drift & Fluctuation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bandwidth | 8.57E-07 | 8.85E-07 | 7.27E-08 | 5.18E-08 | 3.64E-07 | 3.43E-08 | 2.87E-08 | 4.61E-08 | 1 |
| Filter Instability and Long-term Drift(b) | 0 | 0 | 0 | 0 | 0 | 9.5E-06 | 5.6E-06 | 3.9E-06 | 0 |
| Total Type B Uncertainty | 1.35E-06 | 8.44E-06 | 6.02E-06 | 4.85E-06 | 1.84E-05 | 1.06E-05 | 7.72E-06 | 4.66E-06 |  |
| Degrees of Freedom |  |  |  |  |  |  |  |  |  |

**Signature:** \_\_\_\_Joanne Zwinkels\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date**:\_\_\_\_\_\_\_\_April 2, 2015\_\_\_\_\_\_\_\_\_

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| **Table A-2i Measurement Results for NRC (Step 4) - Final** | | | | | | | | |
| **NG 3, 3.1 mm (Filter Identifier: --E)** | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 0.00001249 | 0.0003339 | 0.0009302 | 0.0009951 | 0.005019 | 0.009640 | 0.008416 | 0.007110 |
| Number of Measurements | 3 | 4 | 4 | 5 | 5 | 5 | 4 | 4 |
| Temperature | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Type A Uncertainty(b) | 8.99E-08 | 8.66E-07 | 4.49E-07 | 2.79E-07 | 1.16E-06 | 1.95E-06 | 4.60E-06 | 2.05E-06 |
| Type B Uncertainty(c) | 2.91E-08 | 1.82E-07 | 3.81E-07 | 4.81E-07 | 5.05E-06 | 4.53E-06 | 2.86E-06 | 1.73E-06 |
| Total Uncertainty(d) | 9.45E-08 | 8.85E-07 | 5.89E-07 | 5.56E-07 | 5.18E-06 | 4.94E-06 | 5.42E-06 | 2.68E-06 |
| Eff. Degrees of Freedom | 9 | 8 | 21 | 111 | 2754 | 285 | 13 | 20 |

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| **Table A-2i Uncertainty Results**  All uncertainties are reported as absolute uncertainties. | | | | | | | | | |
| **NG 3, 3.1 mm (--E)** | | | | | | | | | |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | Correlation Coefficient(b) |
| Nonlinearity | 6.38E-13 | 2.41E-10 | 1.04E-09 | 1.09E-09 | 1.60E-08 | 3.24E-08 | 1.77E-08 | 1.01E-08 | 1 |
| Temperature | 1.07E-09 | 3.98E-08 | 1.58E-07 | 1.69E-07 | 4.19E-07 | 5.19E-07 | 5.89E-07 | 4.96E-07 | 0.5 |
| Wavelength | 2.73E-08 | 1.72E-07 | 3.46E-07 | 4.50E-07 | 4.69E-06 | 5.52E-07 | 9.18E-07 | 5.92E-07 | 1 |
| Stray Light | 4.25E-13 | 1.60E-10 | 6.92E-10 | 7.24E-10 | 1.07E-08 | 2.16E-08 | 8.35E-07 | 7.06E-07 | 1 |
| Beam Size & Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Inter-reflection | 0 | 0 | 0 | 0 | 1.83E-06 | 4.47E-06 | 2.64E-06 | 1.55E-06 | 1 |
| Obliquity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Polarization | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Source Drift & Fluctuation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bandwidth | 1.00E-08 | 4.45E-08 | 8.48E-09 | 1.05E-08 | 4.31E-08 | 1.95E-08 | 9.09E-09 | 7.17E-08 | 1 |
| Other(b) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total Type B Uncertainty | 2.91E-08 | 1.82E-07 | 3.81E-07 | 4.81E-07 | 5.05E-06 | 4.53E-06 | 2.86E-06 | 1.73E-06 |  |
| Degrees of Freedom |  |  |  |  |  |  |  |  |  |

**Signature:** \_\_\_\_\_Joanne Zwinkels\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date**:\_\_\_\_April 2, 2015\_\_\_\_\_\_\_\_\_\_\_\_\_