Appendix E. $C_X^2(h)$ Analysis for Individual Runs

**feb05:run1**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 13:31:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:1000 (4 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>10 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\beta$ Car: $\phi:0$ arcseconds, $m_1:1.7$, $\Delta m:0$, Epoch:2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -69:44:5; HA: 01:03:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>27.1$^\circ$ (Air Mass: 1.12)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>13$^\circ$C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f15mm pupil side; Alignment run only; Single star</td>
</tr>
</tbody>
</table>

### Camera ID: C0

| SNR | 9.0 |
| % Saturation | 0.0 |
| mean max pixel | 102.03 |
| Process Inputs | [0 0 0 0] |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.0 |

### Camera ID: C1

| SNR | 8.6 |
| % Saturation | 0.0 |
| mean max pixel | 78.49 |
| Process Inputs | [0 0 0 0] |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.0 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run2**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 14:31:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:7000 (28 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>α Cru: φ:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -01:34:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>23.3° (Air Mass: 1.09)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>13.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f15mm pupil side</td>
</tr>
</tbody>
</table>

| Camera ID: C0 |

<table>
<thead>
<tr>
<th>SNR</th>
<th>8.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>98.05</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 25 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>0.134</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>353</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 25</th>
<th>0 - 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>$3.880 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>8.9</td>
<td>8.9</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.041</td>
<td>0.041</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.002</td>
<td>0.002</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.522</td>
<td>0.522</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.037</td>
<td>0.037</td>
</tr>
</tbody>
</table>

| Camera ID: C1 |

<table>
<thead>
<tr>
<th>SNR</th>
<th>8.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>86.46</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 30 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>0.143</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>331</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>25.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 25</th>
<th>0 - 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>$5.040 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>8.8</td>
<td>8.8</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.002</td>
<td>0.002</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.427</td>
<td>0.427</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.029</td>
<td>0.029</td>
</tr>
</tbody>
</table>
Appendix E. $C^2_N(h)$ Analysis for Individual Runs

feb05:run3

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 14:34:00</td>
</tr>
<tr>
<td>No. Frames Captured</td>
<td>5000 (20 blocks); Used: 5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -01:15:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>22° (Air Mass: 1.08)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>13.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f15mm pupil side</td>
</tr>
</tbody>
</table>

### Camera ID: C0

| SNR | 25.0 |
| % Saturation | 1.7 |
| mean max pixel | 255.00 |
| Process Inputs | [10 30 25 0] |
| $\gamma$ | 0.15 |
| defocus (km) | -0.00 |
| $dr$ (m.pix$^{-1}$) | 1/134 |
| $dh$ (m.pix$^{-1}$) | 357 |
| $h_{\text{max}}$ (km) | 25.2 |

| Altitude Limits (km) | 0 - 25 |
| $\int C^2_N(h) dh$ (m$^{1/3}$) | $4.165 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 8.6 |
| $r_0$ (m) | 0.040 |
| $\varepsilon_{r_0}$ (m) | 0.002 |
| $\theta_0$ (arcseconds) | 0.713 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.056 |

### Camera ID: C1

| SNR | 25.8 |
| % Saturation | 0.8 |
| mean max pixel | 255.00 |
| Process Inputs | [10 30 25 0] |
| $\gamma$ | 0.15 |
| defocus (km) | -0.00 |
| $dr$ (m.pix$^{-1}$) | 1/143 |
| $dh$ (m.pix$^{-1}$) | 334 |
| $h_{\text{max}}$ (km) | 24.9 |

| Altitude Limits (km) | 0 - 25 |
| $\int C^2_N(h) dh$ (m$^{1/3}$) | $4.609 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 5.4 |
| $r_0$ (m) | 0.037 |
| $\varepsilon_{r_0}$ (m) | 0.001 |
| $\theta_0$ (arcseconds) | 0.627 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.035 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run5

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 15:13:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:36:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.9° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12.6°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>13.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>250.13</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 30 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/134</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>362</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>25.1</td>
</tr>
</tbody>
</table>

### Altitude Limits (km)

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 25</th>
<th>0 - 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>$4.875 \times 10^{-12}$</td>
<td>$7.7$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>$0.002$</td>
<td>$0.002$</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>$0.036$</td>
<td>$0.036$</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>$0.586$</td>
<td>$0.586$</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>$0.041$</td>
<td>$0.041$</td>
</tr>
</tbody>
</table>

### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>26.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.7</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[5 8 25 -5]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-3.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/86</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>564</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>22.1</td>
</tr>
</tbody>
</table>

### Altitude Limits (km)

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>-3 - 22</th>
<th>-3 - 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>$1.280 \times 10^{-12}$</td>
<td>$3.2$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>$0.081$</td>
<td>$0.083$</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>$0.002$</td>
<td>$0.002$</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>$1.251$</td>
<td>$1.251$</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>$0.073$</td>
<td>$0.072$</td>
</tr>
</tbody>
</table>
### Appendix E. $C_N^2(h)$ Analysis for Individual Runs

#### feb05:run6

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 15:29:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:1000 (4 blocks); Used:1000 (4 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>α Cru: ϕ:4 arcseconds, $m_1$:1.25, $Δm$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:20:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.4° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>10.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>194.70</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 35 25 0]</td>
</tr>
<tr>
<td>$γ$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/134</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>363</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>

#### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>12.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>212.19</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[5 8 25 -5]</td>
</tr>
<tr>
<td>$γ$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-2.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/125</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>389</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>23.1</td>
</tr>
</tbody>
</table>

### Extracted Slice

#### Fit to Data

<table>
<thead>
<tr>
<th>Altitude (km)</th>
<th>$C_N^2(h)$</th>
<th>$\Delta h$ (m$^{1/3}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 25</td>
<td>$2.129 \times 10^{-12}$</td>
<td>6.1</td>
</tr>
<tr>
<td>5 - 25</td>
<td>$0.000 \times 10^{-12}$</td>
<td>6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude (km)</th>
<th>$C_N^2(h)$</th>
<th>$\Delta h$ (m$^{1/3}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 - 23</td>
<td>$2.704 \times 10^{-12}$</td>
<td>3.6</td>
</tr>
<tr>
<td>20 - 23</td>
<td>$0.000 \times 10^{-12}$</td>
<td>3.6</td>
</tr>
</tbody>
</table>
Appendix E. $C^2_N(h)$ Analysis for Individual Runs

feb05:run7

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 15:36:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:1000 (4 blocks); Used:1000 (4 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:13:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.3° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

| Camera ID: C0 |

<table>
<thead>
<tr>
<th>SNR</th>
<th>9.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>116.74</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 30 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m pix$^{-1}$)</td>
<td>1/134</td>
</tr>
<tr>
<td>$dh$ (m pix$^{-1}$)</td>
<td>363</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 25</th>
<th>7 - 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C^2_N(h) dh$ (m$^{1/3}$)</td>
<td>$2.552 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>9.3</td>
<td>9.3</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.054</td>
<td>0.147</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.003</td>
<td>0.008</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.611</td>
<td>0.762</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.046</td>
<td>0.050</td>
</tr>
</tbody>
</table>

| Camera ID: C1 |

<table>
<thead>
<tr>
<th>SNR</th>
<th>11.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>181.23</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[5 8 25 -5]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-2.00</td>
</tr>
<tr>
<td>$dr$ (m pix$^{-1}$)</td>
<td>1/125</td>
</tr>
<tr>
<td>$dh$ (m pix$^{-1}$)</td>
<td>389</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>23.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>-2 - 23</th>
<th>-2 - 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C^2_N(h) dh$ (m$^{1/3}$)</td>
<td>$3.225 \times 10^{-12}$</td>
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</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.047</td>
<td>0.047</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.902</td>
<td>0.902</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.047</td>
<td>0.047</td>
</tr>
</tbody>
</table>
### Appendix E. $C^2_N(h)$ Analysis for Individual Runs

#### feb05:run8

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run8</th>
</tr>
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<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 15:44:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>α Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:05:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.2° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>13°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Cloud thickening</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

| SNR | 7.7 |
| % Saturation | 0.0 |
| mean max pixel | 61.96 |
| Process Inputs | [10 12 25 0] |
| defocus (km) | -0.00 |
| $dr$ (m.pix$^{-1}$) | 1/134 |
| $dh$ (m.pix$^{-1}$) | 363 |
| $h_{\text{max}}$ (km) | 24.9 |
| $\int C^2_N(h) dh \ (m^{1/3})$ | 4.364 × 10$^{-12}$ |
| $\varepsilon_C$ (%) | 11.7 |
| $r_0$ (m) | 0.039 |
| $\varepsilon_{r_0}$ (m) | 0.003 |
| $\theta_0$ (arcseconds) | 0.613 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.058 |

#### Camera ID: C1

| SNR | 9.4 |
| % Saturation | 0.0 |
| mean max pixel | 104.02 |
| Process Inputs | [5 8 25 -5] |
| defocus (km) | -2.00 |
| $dr$ (m.pix$^{-1}$) | 1/125 |
| $dh$ (m.pix$^{-1}$) | 390 |
| $h_{\text{max}}$ (km) | 23.1 |
| $\int C^2_N(h) dh \ (m^{1/3})$ | 3.558 × 10$^{-12}$ |
| $\varepsilon_C$ (%) | 4.3 |
| $r_0$ (m) | 0.044 |
| $\varepsilon_{r_0}$ (m) | 0.001 |
| $\theta_0$ (arcseconds) | 0.882 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.053 |
### Appendix E. $C_n^2(h)$ Analysis for Individual Runs

#### feb05:run10

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run10</th>
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<tbody>
<tr>
<td>Time (UT)</td>
<td>10-Feb-2005 15:51:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: 00:02:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.2° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>13.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; Cloud cover</td>
</tr>
</tbody>
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#### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
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<tbody>
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<td>% Saturation</td>
<td>0.0</td>
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<td>mean max pixel</td>
<td>46.71</td>
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<tr>
<td>Process Inputs</td>
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<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_n^2(h) dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
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#### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
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</tr>
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<tbody>
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<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>64.62</td>
</tr>
<tr>
<td>Process Inputs</td>
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</tr>
<tr>
<td>$\gamma$</td>
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</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_n^2(h) dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
### Appendix E. $C_N^2(h)$ Analysis for Individual Runs

#### feb05:run20

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run20</th>
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<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 09:12:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Dor: $\phi:0.2$ arcseconds, $m_1:3.8$, $\Delta m:0.5$, Epoch:2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -55:2:20; HA: 01:31:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>$18.3^\circ$ (Air Mass: 1.05)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Separation too narrow for useful trending</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
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</thead>
<tbody>
<tr>
<td>% Saturation</td>
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</tr>
<tr>
<td>mean max pixel</td>
<td>37.58</td>
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<tr>
<td>Process Inputs</td>
<td>$[0 \ 0 \ 0 \ 0]$</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
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</thead>
<tbody>
<tr>
<td>$\int C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>0.000 $\times 10^{-12}$</td>
<td>0.000 $\times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
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</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
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<td>0.000</td>
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#### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
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<tbody>
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<tr>
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</tr>
<tr>
<td>$\gamma$</td>
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</tr>
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<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>0.000 $\times 10^{-12}$</td>
<td>0.000 $\times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
### Appendix E. $C_N^2(h)$ Analysis for Individual Runs

#### feb05:run21

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run21</th>
</tr>
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</tr>
<tr>
<td>No. Frames</td>
<td>Captured: 5000 (20 blocks); Used: 0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Dor: $\phi$: 0.2 arcseconds, $m_1$: 3.8, $\Delta m$: 0.5, Epoch: 2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -55:2:20; HA: 01:42:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.8° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Separation too narrow for useful trending</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>Altitude Limits (km)</th>
<th>$\int C_N^2(h)dh$ (m$^{1/3}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.9</td>
<td>0 - 0</td>
<td>$0.000 \times 10^{-12}$</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>% Saturation</th>
<th>mean max pixel</th>
<th>Process Inputs</th>
<th>$\gamma$</th>
<th>defocus (km)</th>
<th>$dr$ (m.pixels$^{-1}$)</th>
<th>$dh$ (m.pixels$^{-1}$)</th>
<th>$h_{max}$ (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>94.80</td>
<td>[0 0 0 0]</td>
<td>0.00</td>
<td>0.00</td>
<td>1/0</td>
<td>0</td>
<td>0.0</td>
</tr>
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### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>Altitude Limits (km)</th>
<th>$\int C_N^2(h)dh$ (m$^{1/3}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.7</td>
<td>0 - 0</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Saturation</th>
<th>mean max pixel</th>
<th>Process Inputs</th>
<th>$\gamma$</th>
<th>defocus (km)</th>
<th>$dr$ (m.pixels$^{-1}$)</th>
<th>$dh$ (m.pixels$^{-1}$)</th>
<th>$h_{max}$ (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>182.97</td>
<td>[0 0 0 0]</td>
<td>0.00</td>
<td>0.00</td>
<td>1/0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
### Appendix E: $C_2^N(h)$ Analysis for Individual Runs

#### feb05:run23

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run23</th>
</tr>
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<tbody>
<tr>
<td>Time (UT)</td>
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</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\beta$ Mon: $\phi$:7.1 arcseconds, $m_1$:4.62, $\Delta m$:0.38, Epoch:2003</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -7:3:40; HA: 00:17:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>37.1° (Air Mass: 1.25)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; star too faint for cameras</td>
</tr>
</tbody>
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#### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>7.2</th>
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</thead>
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<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>28.84</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_2^N(h)dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
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#### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>7.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>38.37</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_2^N(h)dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

feb05:run25

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 10:03:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured: 5000 (20 blocks); Used: 0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\beta$ Mon: $\phi$ 7.1 arcseconds, $m_1$ 4.62, $\Delta m$ 0.38, Epoch: 2003</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -7:3:40; HA: 00:26:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>37.4° (Air Mass: 1.26)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; star too faint for cameras</td>
</tr>
</tbody>
</table>

**Camera ID: C0**

| SNR | 7.1 |
| % Saturation | 0.0 |
| mean max pixel | 35.87 |
| Process Inputs | [0 0 0 0] |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.0 |
| $\int C_N^2(h) dh$ (m$^{1/3}$) | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.0 |
| $r_0$ (m) | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 |

**Camera ID: C1**

| SNR | 8.5 |
| % Saturation | 0.0 |
| mean max pixel | 63.78 |
| Process Inputs | [0 0 0 0] |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.0 |
| $\int C_N^2(h) dh$ (m$^{1/3}$) | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.0 |
| $r_0$ (m) | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run26**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 10:21:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>27 Pup $\phi$:9.8 arcseconds, $m_1$:4.4, $\Delta m$:0.22, Epoch:2002</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -26:50:20; HA: -00:25:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>17.9° (Air Mass: 1.05)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; star too faint for cameras</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>No Image Available</th>
<th>No Image Available</th>
<th>No Image Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNR</td>
<td>6.9</td>
<td>Altitude Limits (km)</td>
</tr>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C_N^2(h)dh$ (m/3)</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>29.92</td>
<td>$\varepsilon_C$ (%)</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
<td>$r_0$ (m)</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
<td>$\varepsilon_{r_0}$ (m)</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
<td>$\theta_0$ (arcseconds)</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
<td>$h_{max}$ (km)</td>
</tr>
</tbody>
</table>

### Camera ID: C1

<table>
<thead>
<tr>
<th>No Image Available</th>
<th>No Image Available</th>
<th>No Image Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNR</td>
<td>7.8</td>
<td>Altitude Limits (km)</td>
</tr>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C_N^2(h)dh$ (m/3)</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>40.04</td>
<td>$\varepsilon_C$ (%)</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
<td>$r_0$ (m)</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
<td>$\varepsilon_{r_0}$ (m)</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
<td>$\theta_0$ (arcseconds)</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
<td>$h_{max}$ (km)</td>
</tr>
</tbody>
</table>
appendix e. $c_n^2(h)$ analysis for individual runs

feb05:run27

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 10:28:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>27 Pup $\varphi$:9.8 arcseconds, $m_1$:4.4, $\Delta m$:0.22, Epoch:2002</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -26:50:20; HA: -00:17:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>17.5° (Air Mass: 1.05)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; star too faint for cameras</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>32.41</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
<tr>
<td>$\int C_n^2(h)dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
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### Camera ID: C1

<table>
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<tr>
<th>SNR</th>
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<tbody>
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<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>55.68</td>
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<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
<tr>
<td>$\int C_n^2(h)dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (.arcseconds)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
</tr>
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</table>
## Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run30

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 10:43:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured: 5000 (20 blocks); Used: 0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>27 Pup $\phi$: 9.8 arcseconds, $m_1$: 4.4, $\Delta m$: 0.22, Epoch: 2002</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -26:50:20; HA: -00:03:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>17.2° (Air Mass: 1.05)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; star too faint for cameras</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>7.3</th>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C_N^2(h)dh \ (m^{1/3})$</td>
<td>$0.000 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>40.34</td>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
<td>$h_{\text{max}}$ (km)</td>
<td>0.0</td>
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</tbody>
</table>

### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>8.6</th>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C_N^2(h)dh \ (m^{1/3})$</td>
<td>$0.000 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>70.70</td>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
<td>$r_0$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0</td>
<td>$h_{\text{max}}$ (km)</td>
<td>0.0</td>
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</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run35**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 11:06:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured: 5000 (20 blocks); Used: 0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\delta$ Vel: $\phi$: 2.6 arcseconds, $m_1$: 2.5, $\Delta m$: 2.6, Epoch: 2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -54:44:30; HA: -00:46:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>13.1° (Air Mass: 1.03)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>12°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Separation too narrow for useful trending</td>
</tr>
</tbody>
</table>

**Camera ID: C0**

| SNR | 9.6 |
| % Saturation | 0.0 |
| mean max pixel | 102.42 |
| Process Inputs | $[0 \ 0 \ 0 \ 0]$ |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.00 |

| Altitude Limits (km) | 0 - 0 |
| $\int C_N^2(h)dh$ (m$^{1/3}$) | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.000 |
| $r_0$ (m) | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 |

**Camera ID: C1**

| SNR | 14.3 |
| % Saturation | 0.00 |
| mean max pixel | 246.35 |
| Process Inputs | $[0 \ 0 \ 0 \ 0]$ |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.00 |

| Altitude Limits (km) | 0 - 0 |
| $\int C_N^2(h)dh$ (m$^{1/3}$) | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.000 |
| $r_0$ (m) | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run36**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 11:14:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\delta$ Vel: $\phi$:2.6 arcseconds, $m_1$:2.5, $\Delta m$:2.6, Epoch:2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -54:44:30; HA: -00:38:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>12.4° (Air Mass: 1.02)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Separation too narrow for useful trending</td>
</tr>
</tbody>
</table>

**Camera ID: C0**

| SNR | 8.2 |
| % Saturation | 0.0 |
| mean max pixel | 57.51 |
| Process Inputs | [0 0 0 0] |
| $\gamma$ | 0.0 |
| defocus (km) | 0.0 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{max}$ (km) | 0.0 |

| Altitude Limits (km) | 0 - 0 | 0 - 0 |
| $\int C_N^2(h)dh$ (m$^{1/3}$) | $0.000 \times 10^{-12}$ | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.0 | 0.0 |
| $r_0$ (m) | 0.000 | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 | 0.000 |

**Camera ID: C1**

| SNR | 10.0 |
| % Saturation | 0.0 |
| mean max pixel | 121.76 |
| Process Inputs | [0 0 0 0] |
| $\gamma$ | 0.0 |
| defocus (km) | 0.0 |
| $dr$ (m.pix$^{-1}$) | 1/0 |
| $dh$ (m.pix$^{-1}$) | 0 |
| $h_{max}$ (km) | 0.0 |

| Altitude Limits (km) | 0 - 0 | 0 - 0 |
| $\int C_N^2(h)dh$ (m$^{1/3}$) | $0.000 \times 10^{-12}$ | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.0 | 0.0 |
| $r_0$ (m) | 0.000 | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 | 0.000 |
Appendix E. \( C_X^2(h) \) Analysis for Individual Runs

### feb05:run37

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 11:22:00</td>
</tr>
<tr>
<td>No. Frames Captured</td>
<td>5000 (20 blocks); Used: 0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>( \delta ) Vel: ( \phi ): 2.6 arcseconds, ( m_1 ): 2.5, ( \Delta m ): 2.6, Epoch: 2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -54:44:30; HA: -00:30:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>11.8° (Air Mass: 1.02)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.6°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Separation too narrow for useful trending</td>
</tr>
</tbody>
</table>

---

### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>14.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>189.94</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>( \gamma )</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>( dr ) (m.pix(^{-1}))</td>
<td>1/0</td>
</tr>
<tr>
<td>( dh ) (m.pix(^{-1}))</td>
<td>0</td>
</tr>
<tr>
<td>( h_{\text{max}} ) (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

### Altitude Limits (km)

| 0 - 0 |
| 0.000 \( \times 10^{-12} \) |
| 0.000 \( \times 10^{-12} \) |

### \( \int C_X^2(h) dh \) (m\(^{1/3}\))

<table>
<thead>
<tr>
<th>( \varepsilon_C ) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
</tr>
<tr>
<td>0.0</td>
</tr>
</tbody>
</table>

### \( r_0 \) (m)

| 0.000 |
| 0.000 |

### \( \varepsilon_{r_0} \) (m)

| 0.000 |
| 0.000 |

### \( \theta_0 \) (arcseconds)

| 0.000 |
| 0.000 |

### \( \varepsilon_{\theta_0} \) (arcseconds)

| 0.000 |
| 0.000 |

---

### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>22.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.7</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>( \gamma )</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>( dr ) (m.pix(^{-1}))</td>
<td>1/0</td>
</tr>
<tr>
<td>( dh ) (m.pix(^{-1}))</td>
<td>0</td>
</tr>
<tr>
<td>( h_{\text{max}} ) (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

### Altitude Limits (km)

| 0 - 0 |
| 0.000 \( \times 10^{-12} \) |
| 0.000 \( \times 10^{-12} \) |

### \( \int C_X^2(h) dh \) (m\(^{1/3}\))

<table>
<thead>
<tr>
<th>( \varepsilon_C ) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
</tr>
<tr>
<td>0.0</td>
</tr>
</tbody>
</table>

### \( r_0 \) (m)

| 0.000 |
| 0.000 |

### \( \varepsilon_{r_0} \) (m)

| 0.000 |
| 0.000 |

### \( \theta_0 \) (arcseconds)

| 0.000 |
| 0.000 |

### \( \varepsilon_{\theta_0} \) (arcseconds)

| 0.000 |
| 0.000 |
Appendix E. $C_X^2(h)$ Analysis for Individual Runs

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 11:46:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>N Hya $\phi$: 9.3 arcseconds, $m_1$: 5.8, $\Delta m$: 0.1, Epoch: 2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -29:16:20; HA: -02:52:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>37.1° (Air Mass: 1.25)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Insufficient signal; star too faint for cameras</td>
</tr>
</tbody>
</table>

**Camera ID: C0**

<table>
<thead>
<tr>
<th>SNR</th>
<th>7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>25.68</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pixels$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pixels$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table: $\int C_X^2(h)dh (m^{1/3})$

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.000 \times 10^{-12}</td>
<td>0.000 \times 10^{-12}</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Camera ID: C1**

<table>
<thead>
<tr>
<th>SNR</th>
<th>7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>28.87</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>$dr$ (m.pixels$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>$dh$ (m.pixels$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table: $\int C_X^2(h)dh (m^{1/3})$

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 0</th>
<th>0 - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.000 \times 10^{-12}</td>
<td>0.000 \times 10^{-12}</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run45**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 12:42:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>α Cru: φ: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -02:54:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>31° (Air Mass: 1.17)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

### Camera ID: C0

- **SNR**: 11.1
- **% Saturation**: 0.0
- **mean max pixel**: 152.13
- **Process Inputs**
  - $\gamma$: 0.15
  - defocus (km): -0.00
  - $d r$ (m.pix$^{-1}$): 1/140
  - $d h$ (m.pix$^{-1}$): 316
  - $h_{\text{max}}$ (km): 25.1
- **$\int C_N^2(h)dh$ (m$^{1/3}$)**
  - 0 - 25: $1.401 \times 10^{-12}$
  - 25 - 5: $0.000 \times 10^{-12}$
- **$\varepsilon_C$ (%)**: 20.4
- **$\varepsilon_{r_0}$ (m)**: 0.073
- **$\theta_0$ (arcseconds)**: 0.771
- **$\varepsilon_{\theta_0}$ (arcseconds)**: 0.105

### Camera ID: C1

- **SNR**: 16.3
- **% Saturation**: 0.0
- **mean max pixel**: 246.01
- **Process Inputs**
  - $\gamma$: 0.05
  - defocus (km): -1.50
  - $d r$ (m.pix$^{-1}$): 1/113
  - $d h$ (m.pix$^{-1}$): 391
  - $h_{\text{max}}$ (km): 23.3
- **$\int C_N^2(h)dh$ (m$^{1/3}$)**
  - -1 - 23: $2.252 \times 10^{-12}$
  - 23 - 4: $0.000 \times 10^{-12}$
- **$\varepsilon_C$ (%)**: 8.4
- **$\varepsilon_{r_0}$ (m)**: 0.055
- **$\theta_0$ (arcseconds)**: 0.843
- **$\varepsilon_{\theta_0}$ (arcseconds)**: 0.061
### Feb05:Run46

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run46</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 12:49:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -02:44:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>$30.2^\circ$ (Air Mass: 1.16)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.6°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>25.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.2</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process Inputs</th>
<th>[10 35 25 0]</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/140</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>318</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>25.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>0 - 25</th>
<th>5 - 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_N^2 (h) dh$ (m$^{1/3}$)</td>
<td>$0.940 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>13.4</td>
<td>13.4</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.093</td>
<td>0.215</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.007</td>
<td>0.017</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.934</td>
<td>1.003</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.087</td>
<td>0.089</td>
</tr>
</tbody>
</table>

#### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>40.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>5.5</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process Inputs</th>
<th>[5 6 25 -5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-1.50</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/113</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>394</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>23.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude Limits (km)</th>
<th>-1 - 24</th>
<th>14 - 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\int C_N^2 (h) dh$ (m$^{1/3}$)</td>
<td>$1.655 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.066</td>
<td>Inf</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.001</td>
<td>NaN</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>2.521</td>
<td>Inf</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.256</td>
<td>NaN</td>
</tr>
</tbody>
</table>
### Appendix E. $C_N^2(h)$ Analysis for Individual Runs

#### feb05:run50

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 13:20:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\gamma$ Vir: $\phi$:3.7 arcseconds, $m_1$:3.5, $\Delta m$:0, Epoch:2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -1:30:10; HA: -02:28:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>53.7° (Air Mass: 1.69)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Zenith too large for useful trending (i.e. $\approx$30°)</td>
</tr>
</tbody>
</table>

### Camera ID: C0

| SNR | 7.9 |
| % Saturation | 0.0 |
| mean max pixel | 43.87 |
| Process Inputs | $[0 \ 0 \ 0 \ 0]$ |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pixels$^{-1}$) | 1/0 |
| $dh$ (m.pixels$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.0 |
| $\int C_N^2(h) dh (\text{m}^{1/3})$ | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.00 |
| $r_0$ (m) | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 |

### Camera ID: C1

| SNR | 8.5 |
| % Saturation | 0.0 |
| mean max pixel | 55.33 |
| Process Inputs | $[0 \ 0 \ 0 \ 0]$ |
| $\gamma$ | 0.00 |
| defocus (km) | 0.00 |
| $dr$ (m.pixels$^{-1}$) | 1/0 |
| $dh$ (m.pixels$^{-1}$) | 0 |
| $h_{\text{max}}$ (km) | 0.0 |
| $\int C_N^2(h) dh (\text{m}^{1/3})$ | $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 0.00 |
| $r_0$ (m) | 0.000 |
| $\varepsilon_{r_0}$ (m) | 0.000 |
| $\theta_0$ (arcseconds) | 0.000 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.000 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run51

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 13:27:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured: 5000 (20 blocks); Used: 0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\gamma$ Vir: $\phi$: 3.7 arcseconds, $m_1$: 3.5, $\Delta m$: 0, Epoch: 2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -1:30:10; HA: -02:21:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>52.8° (Air Mass: 1.65)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Zenith too large for useful trending (i.e. $\leq 30^\circ$)</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

<table>
<thead>
<tr>
<th>No Image Available</th>
<th>No Image Available</th>
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</tr>
</thead>
<tbody>
<tr>
<td>SNR</td>
<td>9.3</td>
<td>Altitude Limits (km)</td>
</tr>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C_N^2(h) dh (m^{1/3})$</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>93.34</td>
<td>$\varepsilon_C$ (%)</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>$[0 \ 0 \ 0 \ 0]$</td>
<td>$r_0$ (m)</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
<td>$\varepsilon_{r_0}$ (m)</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
<td>$\theta_0$ (arcseconds)</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0.00</td>
<td>$h_{max}$ (km)</td>
</tr>
</tbody>
</table>

#### Camera ID: C1

<table>
<thead>
<tr>
<th>No Image Available</th>
<th>No Image Available</th>
<th>No Image Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNR</td>
<td>11.2</td>
<td>Altitude Limits (km)</td>
</tr>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C_N^2(h) dh (m^{1/3})$</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>141.03</td>
<td>$\varepsilon_C$ (%)</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>$[0 \ 0 \ 0 \ 0]$</td>
<td>$r_0$ (m)</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.00</td>
<td>$\varepsilon_{r_0}$ (m)</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
<td>$\theta_0$ (arcseconds)</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/0</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>0.00</td>
<td>$h_{max}$ (km)</td>
</tr>
</tbody>
</table>
Appendix E. $C^2_N(h)$ Analysis for Individual Runs

feb05:run52

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run52</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 12:35:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:0 (0 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Pre-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>5 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>γ Vir: φ:3.7 arcseconds, m1:3.5, Δm:0, Epoch:2000</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -1:30:10; HA: -02:13:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>51.8° (Air Mass: 1.61)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side; Zenith too large for useful trending (i.e. &lt;30°)</td>
</tr>
</tbody>
</table>

**Camera ID: C0**

<table>
<thead>
<tr>
<th>SNR</th>
<th>10.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>135.51</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>γ</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>dr (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>dh (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
<tr>
<td>$\int C^2_N(h)dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_r_0$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
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</tbody>
</table>

**Camera ID: C1**

<table>
<thead>
<tr>
<th>SNR</th>
<th>13.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>210.36</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[0 0 0 0]</td>
</tr>
<tr>
<td>γ</td>
<td>0.00</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>0.00</td>
</tr>
<tr>
<td>dr (m.pix$^{-1}$)</td>
<td>1/0</td>
</tr>
<tr>
<td>dh (m.pix$^{-1}$)</td>
<td>0</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>0.0</td>
</tr>
<tr>
<td>$\int C^2_N(h)dh$ (m$^{1/3}$)</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>0.0</td>
</tr>
<tr>
<td>$r_0$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_r_0$ (m)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\theta_0$ (arcseconds)</td>
<td>0.000</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run60

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 14:02:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured: 5000 (20 blocks); Used: 5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -01:31:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>23.1° (Air Mass: 1.09)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.4°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>10.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>139.74</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 40 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/140</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>339</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>24.9</td>
</tr>
<tr>
<td>$\int C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>1.264 $\times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>5.9</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.081</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>1.121</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.063</td>
</tr>
</tbody>
</table>

Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>15.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>223.09</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[5 6 25 -5]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-2.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/113</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>420</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>23.0</td>
</tr>
<tr>
<td>$\int C_N^2(h)dh$ (m$^{1/3}$)</td>
<td>1.798 $\times 10^{-12}$</td>
</tr>
<tr>
<td>$\varepsilon_C$ (%)</td>
<td>3.2</td>
</tr>
<tr>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.065</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>1.532</td>
</tr>
<tr>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.094</td>
</tr>
</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run61**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run61</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 14:12:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_i$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -01:21:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>22.4° (Air Mass: 1.08)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

### Camera ID: C0

| SNR       | 24.1 |
| % Saturation | 0.3 |
| mean max pixel | 255.00 |
| Process Inputs | [10 40 25 0] |
| $\gamma$ | 0.15 |
| defocus (km) | -0.00 |
| $d r$ (m.pix$^{-1}$) | 1/140 |
| $d h$ (m.pix$^{-1}$) | 341 |
| $h_{\text{max}}$ (km) | 25.0 |
| Altitude Limits (km) | 0 - 25 |
| $\int C_N^2(h) dh$ (m$^{1/3}$) | $2.012 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 5.7 |
| $r_0$ (m) | 0.061 |
| $\varepsilon_{r_0}$ (m) | 0.002 |
| $\theta_0$ (arcseconds) | 1.111 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.067 |

### Camera ID: C1

| SNR       | 38.6 |
| % Saturation | 4.0 |
| mean max pixel | 255.00 |
| Process Inputs | [5 6 25 -5] |
| $\gamma$ | 0.05 |
| defocus (km) | -2.00 |
| $d r$ (m.pix$^{-1}$) | 1/113 |
| $d h$ (m.pix$^{-1}$) | 422 |
| $h_{\text{max}}$ (km) | 23.1 |
| Altitude Limits (km) | -2 - 23 |
| $\int C_N^2(h) dh$ (m$^{1/3}$) | $1.413 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 2.5 |
| $r_0$ (m) | 0.076 |
| $\varepsilon_{r_0}$ (m) | 0.001 |
| $\theta_0$ (arcseconds) | 1.887 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.122 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run70

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 14:38:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:55:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>20.7° (Air Mass: 1.07)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f19mm generalised side</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

| SNR | 11.1 |
| % Saturation | 0.0 |
| mean max pixel | 177.48 |
| Process Inputs | [10 40 25 0] |
| $\gamma$ | 0.15 |
| defocus (km) | -0.00 |
| $dr$ (m.pix$^{-1}$) | 1/140 |
| $dh$ (m.pix$^{-1}$) | 345 |
| $h_{\text{max}}$ (km) | 25.0 |

#### Camera ID: C1

| SNR | 10.5 |
| % Saturation | 0.0 |
| mean max pixel | 144.18 |
| Process Inputs | [5 10 25 -1] |
| $\gamma$ | 0.05 |
| defocus (km) | -2.20 |
| $dr$ (m.pix$^{-1}$) | 1/200 |
| $dh$ (m.pix$^{-1}$) | 241 |
| $h_{\text{max}}$ (km) | 22.8 |
# Appendix E. $C^2_N(h)$ Analysis for Individual Runs

## feb05:run71

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 14:46:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:3750 (15 blocks); Used:3750 (15 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:47:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>20.3° (Air Mass: 1.07)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f19mm generalised side; Acquisition computer crashed during capture</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>23.0</th>
<th>Altitude Limits (km)</th>
<th>0 - 25</th>
<th>5 - 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.1</td>
<td>$\int C^2_N(h) dh (m^{1/3})$</td>
<td>$1.572 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>254.96</td>
<td>$\varepsilon_C$ (%)</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 40 25 0]</td>
<td>$r_0$ (m)</td>
<td>0.072</td>
<td>0.375</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.004</td>
<td>0.021</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
<td>$\theta_0$ (arcseconds)</td>
<td>1.409</td>
<td>1.884</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/140</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.118</td>
<td>0.122</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>345</td>
<td>$h_{max}$ (km)</td>
<td>25.0</td>
<td></td>
</tr>
</tbody>
</table>

### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>16.0</th>
<th>Altitude Limits (km)</th>
<th>-2 - 23</th>
<th>4 - 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
<td>$\int C^2_N(h) dh (m^{1/3})$</td>
<td>$4.238 \times 10^{-12}$</td>
<td>$0.000 \times 10^{-12}$</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>254.49</td>
<td>$\varepsilon_C$ (%)</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[5 10 25 -5]</td>
<td>$r_0$ (m)</td>
<td>0.040</td>
<td>0.391</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
<td>$\varepsilon_{r_0}$ (m)</td>
<td>0.001</td>
<td>0.008</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-2.20</td>
<td>$\theta_0$ (arcseconds)</td>
<td>0.905</td>
<td>1.906</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/200</td>
<td>$\varepsilon_{\theta_0}$ (arcseconds)</td>
<td>0.042</td>
<td>0.051</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>242</td>
<td>$h_{max}$ (km)</td>
<td>22.8</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

**feb05:run711**

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run711</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 14:58:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:35:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.8° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.4°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f15mm pupil straight; f19mm generalised side</td>
</tr>
</tbody>
</table>

### Camera ID: C0

| SNR | 23.2 |
| % Saturation | 0.1 |
| mean max pixel | 254.82 |
| Process Inputs | [10 40 25 0] |
| $\gamma$ | 0.15 |
| defocus (km) | -0.00 |
| $dr$ (m.pix$^{-1}$) | 1/140 |
| $dh$ (m.pix$^{-1}$) | 347 |
| $h_{max}$ (km) | 25.1 |
| Altitude Limits (km) | 0 - 25, 5 - 25 |
| $\int C_N^2(h)dh$ (m$^{1/3}$) | $1.622 \times 10^{-12}$, $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 9.6, 9.6 |
| $r_0$ (m) | 0.071, 0.301 |
| $\varepsilon_{r_0}$ (m) | 0.004, 0.017 |
| $\theta_0$ (arcseconds) | 1.246, 1.551 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.103, 0.104 |

### Camera ID: C1

| SNR | 15.8 |
| % Saturation | 0.0 |
| mean max pixel | 253.17 |
| Process Inputs | [5 10 25 -5] |
| $\gamma$ | 0.05 |
| defocus (km) | -2.00 |
| $dr$ (m.pix$^{-1}$) | 1/200 |
| $dh$ (m.pix$^{-1}$) | 243 |
| $h_{max}$ (km) | 23.1 |
| Altitude Limits (km) | -2, 23, 4 - 23 |
| $\int C_N^2(h)dh$ (m$^{1/3}$) | $4.445 \times 10^{-12}$, $0.000 \times 10^{-12}$ |
| $\varepsilon_C$ (%) | 3.1, 3.1 |
| $r_0$ (m) | 0.039, 0.346 |
| $\varepsilon_{r_0}$ (m) | 0.001, 0.006 |
| $\theta_0$ (arcseconds) | 0.888, 1.751 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.039, 0.044 |
## Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run75

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 15:15:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$: 4 arcseconds, $m_1$: 1.25, $\Delta m$: 0.3, Epoch: 2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:17:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.3° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f12.7mm pupil straight; f19mm generalised side</td>
</tr>
</tbody>
</table>

### Camera ID: C0

<table>
<thead>
<tr>
<th>Process Inputs</th>
<th>[10 40 25 0]</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/124</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>392</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>

### Camera ID: C1

<table>
<thead>
<tr>
<th>Process Inputs</th>
<th>[5 8 25 -5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-2.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/200</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>243</td>
</tr>
<tr>
<td>$h_{\text{max}}$ (km)</td>
<td>22.9</td>
</tr>
</tbody>
</table>
### Appendix E. $C^2_N(h)$ Analysis for Individual Runs

#### feb05:run76

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 15:25:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: -00:08:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.2° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11.2°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f12.7mm pupil straight; f19mm generalised side; Telescope not aligned as pupil image is not flat</td>
</tr>
</tbody>
</table>

### Camera ID: C0

| SNR | 33.0 |
| % Saturation | 2.0 |
| mean max pixel | 255.00 |
| Process Inputs | [10 40 25 0] |
| $\gamma$ | 0.15 |
| defocus (km) | -0.00 |
| $dr$ (m.pix$^{-1}$) | 1/200 |
| $dh$ (m.pix$^{-1}$) | 393 |
| $h_{max}$ (km) | 24.9 |
| Altitude Limits (km) | 0 - 25 |
| $\int C^2_N(h) dh$ (m$^{1/3}$) | 2.173 $\times 10^{-12}$ |
| $\varepsilon_C$ (%) | 7.1 |
| $r_0$ (m) | 0.059 |
| $\varepsilon_{r_0}$ (m) | 0.003 |
| $\theta_0$ (arcseconds) | 1.086 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.078 |

### Camera ID: C1

| SNR | 16.3 |
| % Saturation | 0.1 |
| mean max pixel | 524.81 |
| Process Inputs | [5 8 25 -5] |
| $\gamma$ | 0.05 |
| defocus (km) | -2.00 |
| $dr$ (m.pix$^{-1}$) | 1/200 |
| $dh$ (m.pix$^{-1}$) | 243 |
| $h_{max}$ (km) | 23.0 |
| Altitude Limits (km) | -2 - 23 |
| $\int C^2_N(h) dh$ (m$^{1/3}$) | 5.038 $\times 10^{-12}$ |
| $\varepsilon_C$ (%) | 3.1 |
| $r_0$ (m) | 0.036 |
| $\varepsilon_{r_0}$ (m) | 0.001 |
| $\theta_0$ (arcseconds) | 0.797 |
| $\varepsilon_{\theta_0}$ (arcseconds) | 0.034 |
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

feb05:run80

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run80</th>
</tr>
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<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 15:46:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>1 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>α Cru: $\phi$4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: 00:13:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.3° (Air Mass: 1.07)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f12.7mm pupil straight; f15mm pupil side</td>
</tr>
</tbody>
</table>

**Camera ID: C0**

<table>
<thead>
<tr>
<th>SNR</th>
<th>12.7</th>
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<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>204.61</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>$[10 \ 40 \ 25 \ 0]$</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/124</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>392</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>

**Camera ID: C1**

<table>
<thead>
<tr>
<th>SNR</th>
<th>11.8</th>
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</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>156.74</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>$[10 \ 45 \ 25 \ 0]$</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/145</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>335</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

feb05:run81

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run81</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 15:54:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>$\alpha$ Cru: $\phi$:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: 00:21:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>19.4° (Air Mass: 1.06)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>11°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f12.7mm pupil straight; f15mm pupil side</td>
</tr>
</tbody>
</table>

Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>32.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>1.9</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 40 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/124</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>392</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>24.9</td>
</tr>
</tbody>
</table>

Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
<th>27.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.4</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[10 45 25 0]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.15</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-0.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/145</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>335</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>25.0</td>
</tr>
</tbody>
</table>
Appendix E. $C^2_N(h)$ Analysis for Individual Runs

feb05:run90

Run ID | run90
---|---
Time (UT) | 12-Feb-2005 16:17:00
No. Frames | Captured:5000 (20 blocks); Used:5000 (20 blocks)
Rig | V2005: C0: Micropix M640 Straight, C1: Thorlabs DC111 Side
Filtering | Post-filtering
Exposure/Gain | 1 ms / max gain
Star | α Cru: φ:4 arcseconds, $m_1$:1.25, $\Delta m$:0.3, Epoch:2005.5
Stellar Coords | Dec: -63:6:30; HA: 00:44:00
Zenith Angle | 20.2° (Air Mass: 1.07)
Air Temp | 10.8°C
Comments | f19mm generalised straight; f12.7mm generalised side; Approaching twilight

Camera ID: C0

SNR | 9.6
---|---
% Saturation | 0.0
mean max pixel | 121.83
Process Inputs | [5 6 25 -5]
$\gamma$ | 0.05
defocus (km) | -1.50
$dr$ (m.pix$^{-1}$) | 1/186
dh (m.pix$^{-1}$) | 260
$h_{\text{max}}$ (km) | 23.6

Altitude Limits (km) | -1 - 24
---|---
$\int C^2_N(h)dh$ (m$^{1/3}$) | 2.713 x 10$^{-12}$
$\varepsilon_C$ (%) | 9.4
$r_0$ (m) | 0.052
$\varepsilon_r_0$ (m) | 0.003
$\theta_0$ (arcseconds) | 1.132
$\varepsilon_{\theta_0}$ (arcseconds) | 0.089

Camera ID: C1

SNR | 14.4
---|---
% Saturation | 0.0
mean max pixel | 229.57
Process Inputs | [5 6 25 -5]
$\gamma$ | 0.05
defocus (km) | -2.00
$dr$ (m.pix$^{-1}$) | 1/132
dh (m.pix$^{-1}$) | 367
$h_{\text{max}}$ (km) | 23.1

Altitude Limits (km) | -2 - 23
---|---
$\int C^2_N(h)dh$ (m$^{1/3}$) | 2.178 x 10$^{-12}$
$\varepsilon_C$ (%) | 3.3
$r_0$ (m) | 0.059
$\varepsilon_r_0$ (m) | 0.001
$\theta_0$ (arcseconds) | 1.224
$\varepsilon_{\theta_0}$ (arcseconds) | 0.063
Appendix E. $C_N^2(h)$ Analysis for Individual Runs

### feb05:run91

<table>
<thead>
<tr>
<th>Run ID</th>
<th>run91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (UT)</td>
<td>12-Feb-2005 16:23:00</td>
</tr>
<tr>
<td>No. Frames</td>
<td>Captured:5000 (20 blocks); Used:5000 (20 blocks)</td>
</tr>
<tr>
<td>Rig</td>
<td>V2005: C0:Micropix M640 Straight, C1:Thorlabs DC111 Side</td>
</tr>
<tr>
<td>Filtering</td>
<td>Post-filtering</td>
</tr>
<tr>
<td>Exposure/Gain</td>
<td>3 ms / max gain</td>
</tr>
<tr>
<td>Star</td>
<td>α Cru: φ:4 arcseconds, $m_1$:1.25, Δ$m$:0.3, Epoch:2005.5</td>
</tr>
<tr>
<td>Stellar Coords</td>
<td>Dec: -63:6:30; HA: 00:50:00</td>
</tr>
<tr>
<td>Zenith Angle</td>
<td>20.5° (Air Mass: 1.07)</td>
</tr>
<tr>
<td>Air Temp</td>
<td>10.8°C</td>
</tr>
<tr>
<td>Comments</td>
<td>f19mm generalised straight; f12.7mm generalised side</td>
</tr>
</tbody>
</table>

#### Camera ID: C0

<table>
<thead>
<tr>
<th>SNR</th>
<th>16.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Saturation</td>
<td>0.0</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>253.36</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[6 6 25 -5]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-1.50</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/186</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>260</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>23.6</td>
</tr>
</tbody>
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#### Camera ID: C1

<table>
<thead>
<tr>
<th>SNR</th>
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<tbody>
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<td>% Saturation</td>
<td>1.7</td>
</tr>
<tr>
<td>mean max pixel</td>
<td>255.00</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>[5 6 25 -5]</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.05</td>
</tr>
<tr>
<td>defocus (km)</td>
<td>-2.00</td>
</tr>
<tr>
<td>$dr$ (m.pix$^{-1}$)</td>
<td>1/132</td>
</tr>
<tr>
<td>$dh$ (m.pix$^{-1}$)</td>
<td>366</td>
</tr>
<tr>
<td>$h_{max}$ (km)</td>
<td>23.1</td>
</tr>
</tbody>
</table>