M31 Reduction

Name:

Date:

**Calibration Constant**

*Please show one example of your calculation of the constant in the equation: m = -2.5 log10(S/T) + constant*

Filter: \_\_\_\_\_\_\_\_\_\_

Apparent magnitude of the calibration star in this filter (m): \_\_\_\_\_\_\_\_\_\_

Exposure time (T): \_\_\_\_\_\_\_\_\_\_ (seconds)

Photon count with sky background subtracted (S): \_\_\_\_\_\_\_\_\_\_

Constant: \_\_\_\_\_\_\_\_\_\_

*Your derived values of constants for both filters:*

Constant for B filter: \_\_\_\_\_\_\_\_\_\_

Constant for V filter: \_\_\_\_\_\_\_\_\_\_

**M31 Magnitude**

*Please show one example of your calculation of the M31 magnitude, using the equation: m = -2.5 log10(S/T) + constant*

Filter: \_\_\_\_\_\_\_\_\_\_

Calibration constant for this filter: \_\_\_\_\_\_\_\_\_\_

Exposure time (T): \_\_\_\_\_\_\_\_\_\_ (seconds)

Photon count with sky background subtracted (S): \_\_\_\_\_\_\_\_\_\_

Derived apparent magnitude: \_\_\_\_\_\_\_\_\_\_

*Please fill in all your other measurements/calculation results in the table on the next page*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Filter | Exposure Time (seconds) | Image Number | Aperture Radius (pixels) | Photon Count | Magnitude | Average Magnitude |
| B |  | 1 | 16 |  |  |  |
| 2 |  |  |
| B |  | 1 | 32 |  |  |  |
| 2 |  |  |
| B |  | 1 | 48 |  |  |  |
| 2 |  |  |
| B |  | 1 | 96 |  |  |  |
| 2 |  |  |
| V |  | 1 | 16 |  |  |  |
| 2 |  |  |
| V |  | 1 | 32 |  |  |  |
| 2 |  |  |
| V |  | 1 | 48 |  |  |  |
| 2 |  |  |
| V |  | 1 | 96 |  |  |  |
| 2 |  |  |

M57 Reduction

**Calibration Constant**

*Please show one example of your calculation of the constant in the equation: m = -2.5 log10(S/T) + constant*

Filter: \_\_\_\_\_\_\_\_\_\_

Apparent magnitude of the calibration star in this filter (m): \_\_\_\_\_\_\_\_\_\_

Exposure time (T): \_\_\_\_\_\_\_\_\_\_ (seconds)

Photon count with sky background subtracted (S): \_\_\_\_\_\_\_\_\_\_

Constant: \_\_\_\_\_\_\_\_\_\_

*Your derived values of constants for both filters:*

Constant for B filter: \_\_\_\_\_\_\_\_\_\_

Constant for V filter: \_\_\_\_\_\_\_\_\_\_

**M57 Magnitude**

*Please fill in your raw measurements of photon counts in the table below:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Filter | Exposure Time (seconds) | Image Number | Aperture Radius (pixels) | Photon Count |
| B |  | 1 |  |  |
| 2 |  |
| B |  | 1 |  |  |
| 2 |  |
| B |  | 1 |  |  |
| 2 |  |
| V |  | 1 |  |  |
| 2 |  |
| V |  | 1 |  |  |
| 2 |  |
| V |  | 1 |  |  |
| 2 |  |

*For M57, we would like to measure the magnitude of both the central white dwarf (WD) and the surrounding ring. The central star is measured by the photon count (already corrected for the sky background) within the smallest aperture The surrounding ring is measured by the difference of the photon counts within the largest aperture and that within the medium-size aperture.*

*With this in mind, please show one example of your calculation of the M57 ring magnitude, using the equation:  
m = -2.5 log10(S/T) + constant*

Filter: \_\_\_\_\_\_\_\_\_\_

Calibration constant for this filter: \_\_\_\_\_\_\_\_\_\_

Exposure time (T): \_\_\_\_\_\_\_\_\_\_ (seconds)

Photon count within the largest aperture: \_\_\_\_\_\_\_\_\_\_

Photon count within the medium aperture: \_\_\_\_\_\_\_\_\_\_

Photon count of the ring region (S): \_\_\_\_\_\_\_\_\_\_

Derived apparent magnitude for the ring region: \_\_\_\_\_\_\_\_\_\_

*Please fill in all your other measurements/calculation results in the table below*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Filter | Exposure Time (seconds) | Image Number | Measured Region | Photon Count | Magnitude | Average Magnitude |
| B |  | 1 | Central WD |  |  |  |
| 2 |  |  |
| B |  | 1 | Outer ring |  |  |  |
| 2 |  |  |
| V |  | 1 | Central WD |  |  |  |
| 2 |  |  |
| V |  | 1 | Outer ring |  |  |  |
| 2 |  |  |