# CFH12K Magnitude dependence on airmass and moon: point sources and galaxies

*All magnitudes are taken within an aperture diameter of 3.09 arcseconds (15 pixels).*
*Galaxies are assumed to have seeing-dominated profiles (i.e. distant, compact sources)*
**SNR** (Signal to noise ratio) is defined over an aperture diameter of 1.45 × seeing for point sources, 1.67 × seeing for galaxies.
**Etime** (Total accumulated exposure time) is 600 seconds for all cases.
**Seeing** values are in arcseconds.

**Magnitudes reached at various SNR for point source: moon and airmass dependency for 600s exposure**

| | B | | | | V | | | | R | | | | I | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SNR=3** | Seeing | | | | Seeing | | | | Seeing | | | | Seeing | | | |
| | 0.6″ | 0.8″ | 1.0″ | 1.2″ | 0.6″ | 0.8″ | 1.0″ | 1.2″ | 0.6″ | 0.8″ | 1.0″ | 1.2″ | 0.6″ | 0.8″ | 1.0″ | 1.2″ |
| D/1.0 | 26.3 | 26.0 | 25.8 | 25.6 | 26.0 | 25.7 | 25.5 | 25.3 | 25.7 | 25.4 | 25.2 | 25.0 | 24.9 | 24.6 | 24.4 | 24.3 |
| D/1.5 | 26.1 | 25.8 | 25.6 | 25.5 | 25.7 | 25.5 | 25.2 | 25.1 | 25.5 | 25.2 | 25.0 | 24.9 | 24.8 | 24.5 | 24.3 | 24.2 |
| M/1.0 | 25.7 | 25.4 | 25.2 | 25.0 | 25.6 | 25.3 | 25.1 | 24.9 | 25.5 | 25.2 | 25.0 | 24.9 | 24.9 | 24.6 | 24.4 | 24.2 |
| M/1.5 | 25.6 | 25.3 | 25.1 | 24.9 | 25.4 | 25.1 | 24.9 | 24.8 | 25.4 | 25.1 | 24.9 | 24.7 | 24.8 | 24.5 | 24.3 | 24.1 |
| **SNR=7** | | | | | | | | | | | | | | | | |
| D/1.0 | 25.3 | 25.1 | 24.9 | 24.7 | 25.0 | 24.7 | 24.5 | 24.4 | 24.7 | 24.4 | 24.2 | 24.1 | 24.0 | 23.7 | 23.5 | 23.4 |
| D/1.5 | 25.2 | 24.9 | 24.7 | 24.6 | 24.8 | 24.5 | 24.3 | 24.2 | 24.6 | 24.3 | 24.1 | 23.9 | 23.9 | 23.6 | 23.4 | 23.2 |
| M/1.0 | 24.8 | 24.5 | 24.3 | 24.1 | 24.6 | 24.4 | 24.1 | 24.0 | 24.6 | 24.3 | 24.1 | 23.9 | 23.9 | 23.7 | 23.5 | 23.3 |
| M/1.5 | 24.6 | 24.4 | 24.2 | 24.0 | 24.5 | 24.2 | 24.0 | 23.9 | 24.4 | 24.2 | 24.0 | 23.8 | 23.8 | 23.5 | 23.3 | 23.2 |
| **SNR=15** | | | | | | | | | | | | | | | | |
| D/1.0 | 24.5 | 24.2 | 24.0 | 23.9 | 24.2 | 23.9 | 23.7 | 23.6 | 23.9 | 23.6 | 23.4 | 23.3 | 23.2 | 22.9 | 22.7 | 22.5 |
| D/1.5 | 24.3 | 24.1 | 23.9 | 23.7 | 24.0 | 23.7 | 23.5 | 23.3 | 23.7 | 23.4 | 23.2 | 23.1 | 23.0 | 22.8 | 22.6 | 22.4 |
| M/1.0 | 23.9 | 23.6 | 23.4 | 23.3 | 23.8 | 23.5 | 23.3 | 23.2 | 23.7 | 23.5 | 23.3 | 23.1 | 23.1 | 22.8 | 22.6 | 22.5 |
| M/1.5 | 23.8 | 23.5 | 23.3 | 23.2 | 23.7 | 23.4 | 23.2 | 23.0 | 23.6 | 23.3 | 23.1 | 23.0 | 23.0 | 22.7 | 22.5 | 22.4 |
| **SNR=25** | | | | | | | | | | | | | | | | |
| D/1.0 | 23.9 | 23.6 | 23.4 | 23.3 | 23.6 | 23.3 | 23.1 | 23.0 | 23.3 | 23.0 | 22.8 | 22.7 | 22.6 | 22.3 | 22.1 | 22.0 |
| D/1.5 | 23.7 | 23.5 | 23.3 | 23.1 | 23.4 | 23.1 | 22.9 | 22.8 | 23.2 | 22.9 | 22.7 | 22.5 | 22.5 | 22.2 | 22.0 | 21.8 |
| M/1.0 | 23.3 | 23.0 | 22.9 | 22.7 | 23.2 | 22.9 | 22.7 | 22.6 | 23.2 | 22.9 | 22.7 | 22.6 | 22.5 | 22.3 | 22.1 | 21.9 |
| M/1.5 | 23.2 | 22.9 | 22.7 | 22.6 | 23.1 | 22.8 | 22.6 | 22.5 | 23.0 | 22.8 | 22.6 | 22.4 | 22.4 | 22.1 | 21.9 | 21.8 |

**Magnitudes reached at various SNR for galaxies moon and airmass dependency for 600s exposure**

| | B | | | | V | | | | R | | | | I | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SNR=3** | Seeing | | | | Seeing | | | | Seeing | | | | Seeing | | | |
| | 0.6″ | 0.8″ | 1.0″ | 1.2″ | 0.6″ | 0.8″ | 1.0″ | 1.2″ | 0.6″ | 0.8″ | 1.0″ | 1.2″ | 0.6″ | 0.8″ | 1.0″ | 1.2″ |
| D/1.0 | 26.0 | 25.7 | 25.6 | 25.5 | 25.6 | 25.4 | 25.3 | 25.2 | 25.3 | 25.1 | 25.0 | 24.9 | 24.6 | 24.4 | 24.3 | 24.2 |
| D/1.5 | 25.8 | 25.6 | 25.5 | 25.4 | 25.4 | 25.2 | 25.1 | 25.0 | 25.2 | 25.0 | 24.8 | 24.7 | 24.5 | 24.3 | 24.1 | 24.0 |
| M/1.0 | 25.4 | 25.2 | 25.0 | 24.9 | 25.2 | 25.0 | 24.9 | 24.8 | 25.2 | 25.0 | 24.8 | 24.8 | 24.5 | 24.3 | 24.2 | 24.1 |
| M/1.5 | 25.3 | 25.0 | 24.9 | 24.8 | 25.1 | 24.9 | 24.8 | 24.7 | 25.1 | 24.8 | 24.7 | 24.6 | 24.4 | 24.2 | 24.1 | 24.0 |
| **SNR=7** | | | | | | | | | | | | | | | | |
| D/1.0 | 25.0 | 24.8 | 24.7 | 24.6 | 24.7 | 24.5 | 24.4 | 24.3 | 24.4 | 24.2 | 24.1 | 24.0 | 23.7 | 23.5 | 23.3 | 23.2 |
| D/1.5 | 24.9 | 24.7 | 24.5 | 24.5 | 24.5 | 24.3 | 24.2 | 24.1 | 24.2 | 24.0 | 23.9 | 23.8 | 23.6 | 23.3 | 23.2 | 23.1 |
| M/1.0 | 24.4 | 24.2 | 24.1 | 24.0 | 24.3 | 24.1 | 24.0 | 23.9 | 24.3 | 24.1 | 23.9 | 23.8 | 23.6 | 23.4 | 23.3 | 23.2 |
| M/1.5 | 24.3 | 24.1 | 24.0 | 23.9 | 24.2 | 24.0 | 23.8 | 23.8 | 24.1 | 23.9 | 23.8 | 23.7 | 23.5 | 23.3 | 23.2 | 23.1 |
| **SNR=15** | | | | | | | | | | | | | | | | |
| D/1.0 | 24.2 | 24.0 | 23.8 | 23.8 | 23.9 | 23.7 | 23.5 | 23.5 | 23.6 | 23.4 | 23.2 | 23.1 | 22.8 | 22.6 | 22.5 | 22.4 |
| D/1.5 | 24.0 | 23.8 | 23.7 | 23.6 | 23.6 | 23.4 | 23.3 | 23.2 | 23.4 | 23.2 | 23.1 | 23.0 | 22.7 | 22.5 | 22.4 | 22.3 |
| M/1.0 | 23.6 | 23.4 | 23.3 | 23.2 | 23.5 | 23.3 | 23.1 | 23.1 | 23.4 | 23.2 | 23.1 | 23.0 | 22.8 | 22.6 | 22.4 | 22.4 |
| M/1.5 | 23.5 | 23.3 | 23.1 | 23.1 | 23.3 | 23.1 | 23.0 | 22.9 | 23.3 | 23.1 | 22.9 | 22.9 | 22.7 | 22.5 | 22.3 | 22.3 |
| **SNR=25** | | | | | | | | | | | | | | | | |
| D/1.0 | 23.6 | 23.4 | 23.3 | 23.2 | 23.3 | 23.1 | 23.0 | 22.9 | 23.0 | 22.8 | 22.7 | 22.6 | 22.3 | 22.1 | 21.9 | 21.8 |
| D/1.5 | 23.4 | 23.2 | 23.1 | 23.0 | 23.1 | 22.9 | 22.7 | 22.7 | 22.8 | 22.6 | 22.5 | 22.4 | 22.2 | 21.9 | 21.8 | 21.7 |
| M/1.0 | 23.0 | 22.8 | 22.7 | 22.6 | 22.9 | 22.7 | 22.6 | 22.5 | 22.8 | 22.6 | 22.5 | 22.4 | 22.2 | 22.0 | 21.9 | 21.8 |
| M/1.5 | 22.9 | 22.7 | 22.6 | 22.5 | 22.8 | 22.6 | 22.4 | 22.4 | 22.7 | 22.5 | 22.4 | 22.3 | 22.1 | 21.9 | 21.8 | 21.7 |

**D/1.0** Dark sky, Airmass=1.0
**D/1.5** Dark sky, Airmass=1.5
**M/1.0** Moon up, 50% illuminated, more than 45 degrees from object, Airmass=1.0.
**M/1.5** Moon up, 50% illuminated, more than 45 degrees from object, Airmass=1.5.