

To show how I calculat the individual noise term from 2 data count as follow:-

Mag	FWHM	f_sky (ADU)	f_star (ADU)
8	1.5	3883	20900
9	1.5	3883	8320

Also, as background information about the system that has been used to acquire such data :

Zero point instrument magnitude = 14.355.

Exposure = 60 sec.

Gain = 2.38 e-/ADU.

Ron = 15 e-rms (catalog value).

To calculate individual noise source we need to define these terms:-

$$N_{pix} = 4\pi\sigma^2, \text{ where } \sigma = \frac{FWHM}{\sqrt{8\ln 2}}$$

Noise	Formula	Calculation	$\sigma$ (ADU)	Conversion formula	$\sigma(m)$
Photon	$\sigma_{ph} = \sqrt{\frac{f_*}{G}}$	$= \sqrt{\frac{20900}{2.38}}$	93.709	$\sigma(m) = \sigma_{ph} \frac{1.0857}{f_*}$	.0048
"	"	$\sqrt{\frac{8320}{2.38}}$	59.125	"	.0077
Readout	$\sigma_{rd} = \frac{\sigma_0}{G} \sqrt{(N_{pix})}$	$= \frac{15}{2.38} \left( \sqrt{4\pi \left( \frac{1.5}{\sqrt{8\ln 2}} \right)^2} \right)$	14.227	$\sigma(m) = \sigma_{rd} \frac{1.0857}{f_*}$	0.0007
"	"	$= \frac{15}{2.38} \left( \sqrt{4\pi \left( \frac{1.5}{\sqrt{8\ln 2}} \right)^2} \right)$	14.227	"	0.0018
Sky	$\sigma_{sk} = \sqrt{\frac{f_{sk} N_{pix}}{G}}$	$= \sqrt{\frac{3883 \left( 4\pi \left( \frac{1.5}{\sqrt{8\ln 2}} \right)^2 \right)}{2.38}}$	91.185	$\sigma(m) = \sigma_{sk} \frac{1.0857}{f_*}$	0.0047
"	"	$= \sqrt{\frac{3883 \left( 4\pi \left( \frac{1.5}{\sqrt{8\ln 2}} \right)^2 \right)}{2.38}}$	91.185	"	0.0119

$$\text{Total noise for 8 Mag star} = \sqrt{(.0048)^2 + (.0007)^2 + (.0047)^2} = .0067543$$

$$\text{Total noise for 9 Mag star} = \sqrt{(.0077)^2 + (0.0018)^2 + (0.0119)^2} = .014288$$