

## EMVA 1288 Data Sheet mACC2P0013

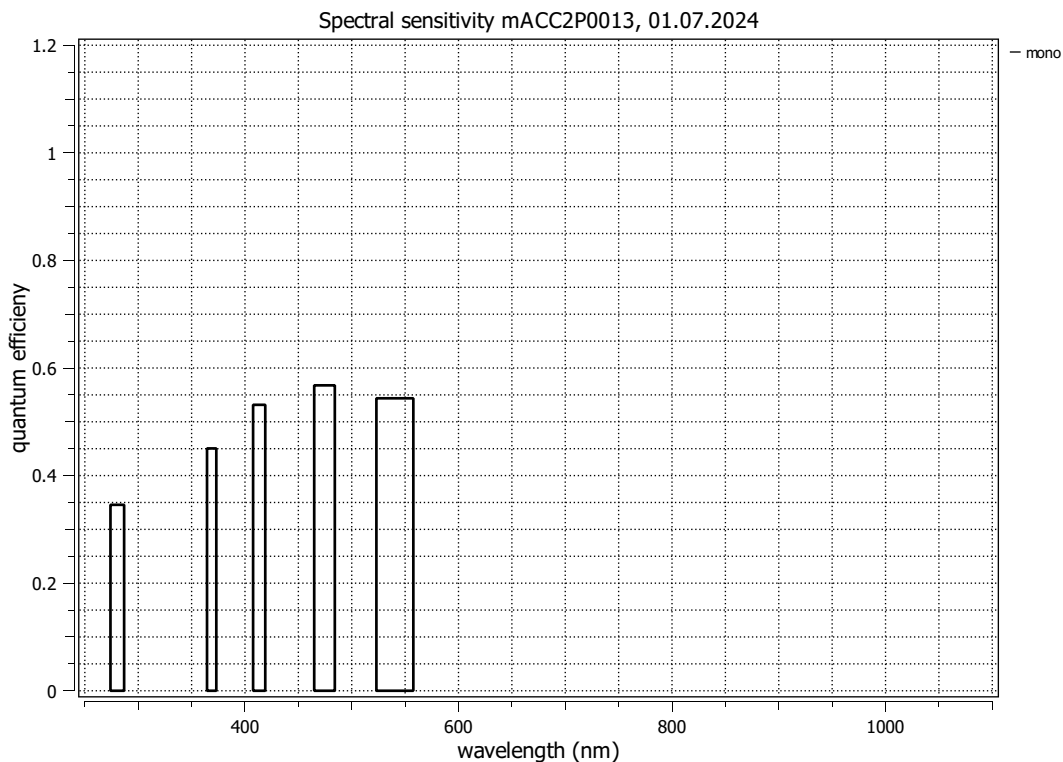
This data sheet describes the specification according to the standard 1288 Release 4.0 Linear issued on 21 June 2021 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" by the European Machine Vision Association (EMVA), published at <https://www.emva.org/standards-technology/emva-1288/> with proprietary extensions from AEON. The measurements were performed with the AEON ACC2b 13x1 color, Release 9, 13.11.2020, SN 0067(Baumer), software version 2.0.

Measurements performed by Baumer Optronic GmbH. The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

Type of data presented	Single
Vendor	Baumer
Model	VLXT-83UV.I
Serial number	700011115237
Sensor diagonal	11.00 mm
Lens category	C-Mount
Resolution	2848 × 2832, 12 bit
Offset/Size used	0 × 0/ 2848 × 2832
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	Sony IMX487
Sensor type	CMOS
Shutter type	Global shutter
Overlap cap.	Overlapped
Max. frame rate	0.0 Hz
Interface type	GEV

Nr.	Centroid/FWHM	Gain, blacklevel	$t_{exp}$ (ms)
1	280.4/12.8 nm	1.0 / 39.0	50.0
2	368.8/8.7 nm	1.0 / 39.0	3.13
3	413.3/11.4 nm	1.0 / 39.0	3.13
4	474.5/19.3 nm	1.0 / 39.0	1.57
5	540.4/34.6 nm	1.0 / 39.0	3.13

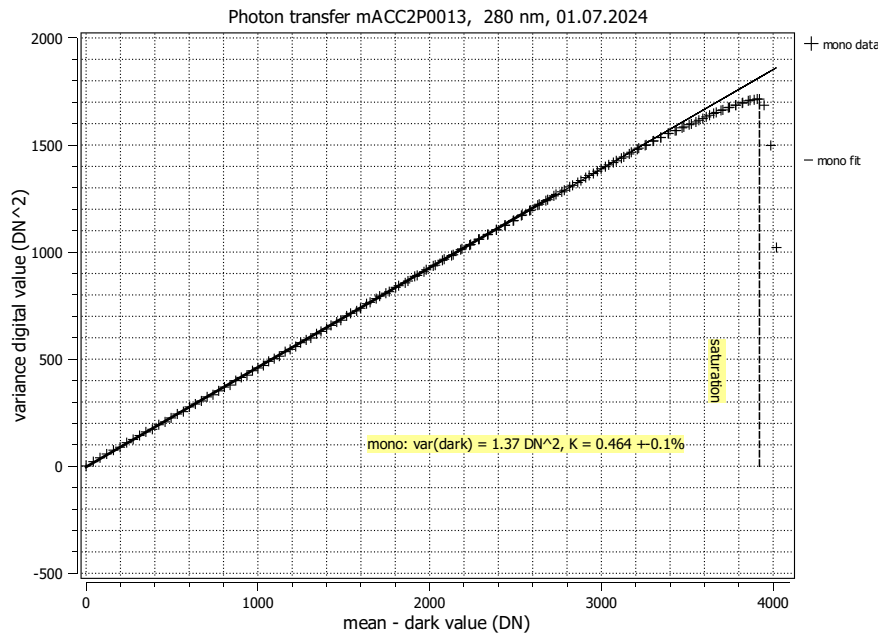
Optional data measured: None



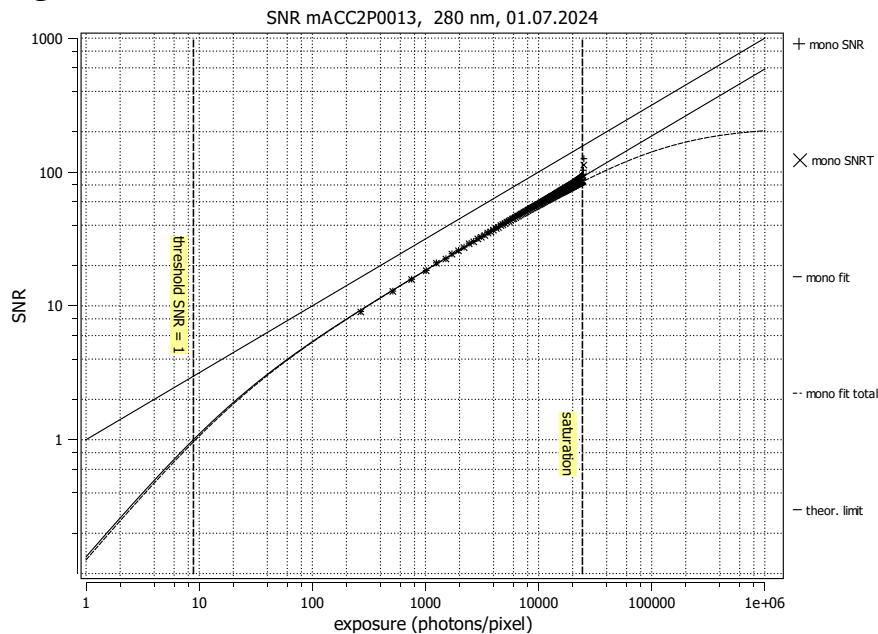
## Summary Sheet for Operation Point 1 at a Wavelength of 280 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	23.8°C
Exposure time	50.000 ms	Camera body temperature	38.0°C
Frame rate	10.0 Hz	Internal temperature(s)	0.0°C
Data transfer mode	Mono12	Wavelength, centr., FWHM	280 nm, 12.8 nm

### Photon Transfer



### Signal-to-Noise Ratio



#### Quantum efficiency

$\eta$  34.6%

#### Overall system gain

$K$  0.4639 DN/e<sup>-</sup>

1/ $K$  2.156 e<sup>-</sup>/DN

#### Temporal dark noise

$\sigma_d$  2.45 e<sup>-</sup>

$\sigma_{y,\text{dark}}$  1.17 DN

#### Signal-to-noise ratio

SNR<sub>max</sub> 91.9

39.3 dB

1/SNR<sub>max</sub> 1.089%

#### Absolute sensitivity threshold

$\mu_{e,\text{min}}$  3.07 e<sup>-</sup>

$\mu_{e,\text{min,area}}$  0.409 e<sup>-</sup>/μm<sup>2</sup>

#### Saturation capacity

$\mu_{e,\text{sat}}$  8438 e<sup>-</sup>

$\mu_{e,\text{sat,area}}$  1124 e<sup>-</sup>/μm<sup>2</sup>

#### Dynamic range

DR 2746

68.77 dB

#### Spatial nonuniformities

DSNU<sub>1288</sub> 0.859 e<sup>-</sup>

DSNU<sub>1288,col</sub> 0.016 e<sup>-</sup>

DSNU<sub>1288,row</sub> 0.022 e<sup>-</sup>

DSNU<sub>1288,pix</sub> 0.858 e<sup>-</sup>

PRNU<sub>1288</sub> 0.461 %

PRNU<sub>1288,col</sub> 0.056 %

PRNU<sub>1288,row</sub> 0.028 %

PRNU<sub>1288,pix</sub> 0.457 %

#### Linearity error

LE 0.18%

#### Dark current

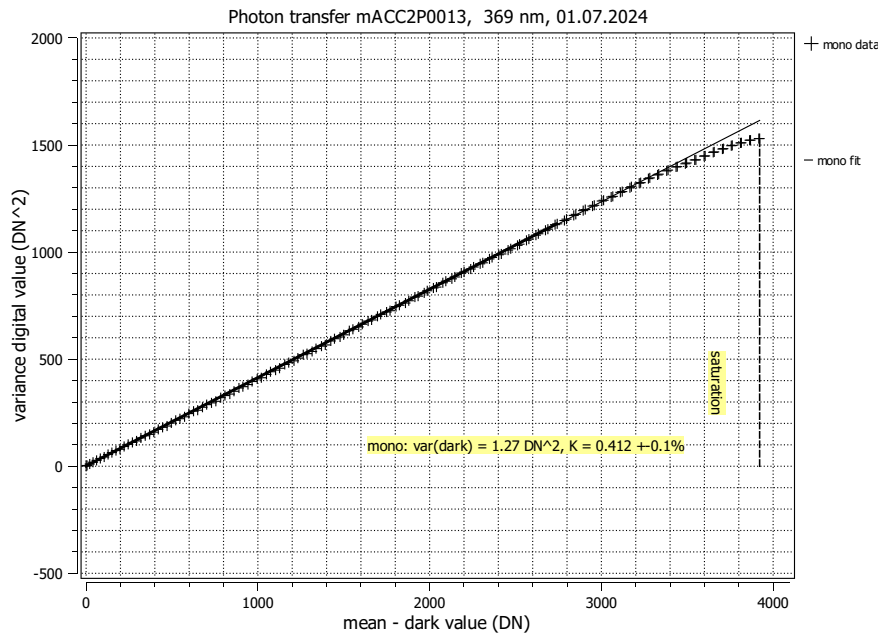
$\mu_{c,\text{mean}}$  — e<sup>-</sup>/s

$\mu_{c,\text{var}}$  — e<sup>-</sup>/s

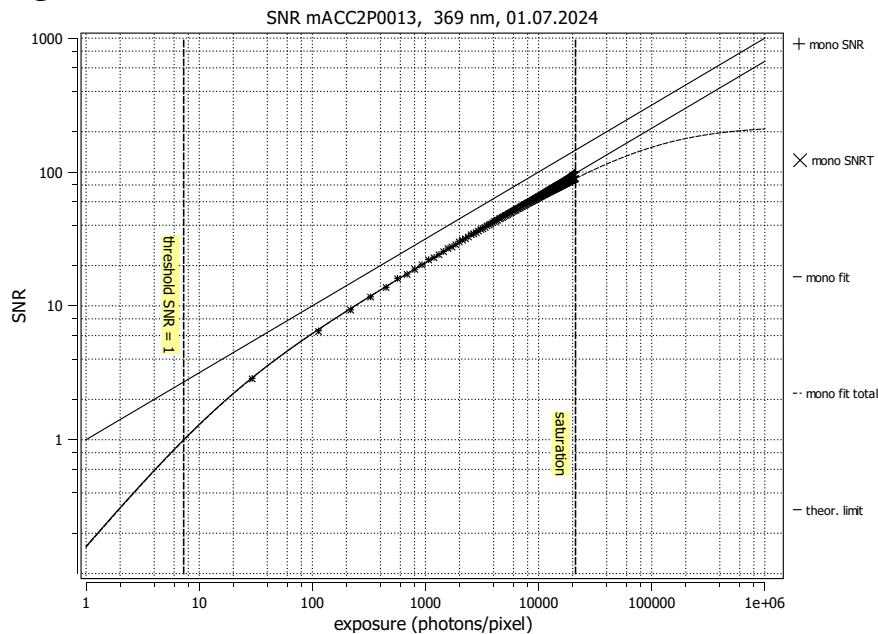
## Summary Sheet for Operation Point 2 at a Wavelength of 369 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	23.8°C
Exposure time	3.130 ms	Camera body temperature	37.8°C
Frame rate	10.0 Hz	Internal temperature(s)	0.0°C
Data transfer mode	Mono12	Wavelength, centr., FWHM	369 nm, 8.7 nm

### Photon Transfer



### Signal-to-Noise Ratio



#### Quantum efficiency

$\eta$  45.1%

#### Overall system gain

$K$  0.4123 DN/e<sup>-</sup>

$1/K$  2.426 e<sup>-</sup>/DN

#### Temporal dark noise

$\sigma_d$  2.65 e<sup>-</sup>

$\sigma_{y,\text{dark}}$  1.13 DN

#### Signal-to-noise ratio

SNR<sub>max</sub> 97.7

39.8 dB

$1/\text{SNR}_{\text{max}}$  1.023 %

#### Absolute sensitivity threshold

$\mu_{e,\text{min}}$  3.28 e<sup>-</sup>

$\mu_{e,\text{min,area}}$  0.437 e<sup>-</sup>/μm<sup>2</sup>

#### Saturation capacity

$\mu_{e,\text{sat}}$  9554 e<sup>-</sup>

$\mu_{e,\text{sat,area}}$  1273 e<sup>-</sup>/μm<sup>2</sup>

#### Dynamic range

DR 2911

69.28 dB

#### Spatial nonuniformities

DSNU<sub>1288</sub> 0.471 e<sup>-</sup>

DSNU<sub>1288,col</sub> 0.019 e<sup>-</sup>

DSNU<sub>1288,row</sub> 0.019 e<sup>-</sup>

DSNU<sub>1288,pix</sub> 0.470 e<sup>-</sup>

PRNU<sub>1288</sub> 0.453 %

PRNU<sub>1288,col</sub> 0.043 %

PRNU<sub>1288,row</sub> 0.026 %

PRNU<sub>1288,pix</sub> 0.450 %

#### Linearity error

LE 0.09%

#### Dark current

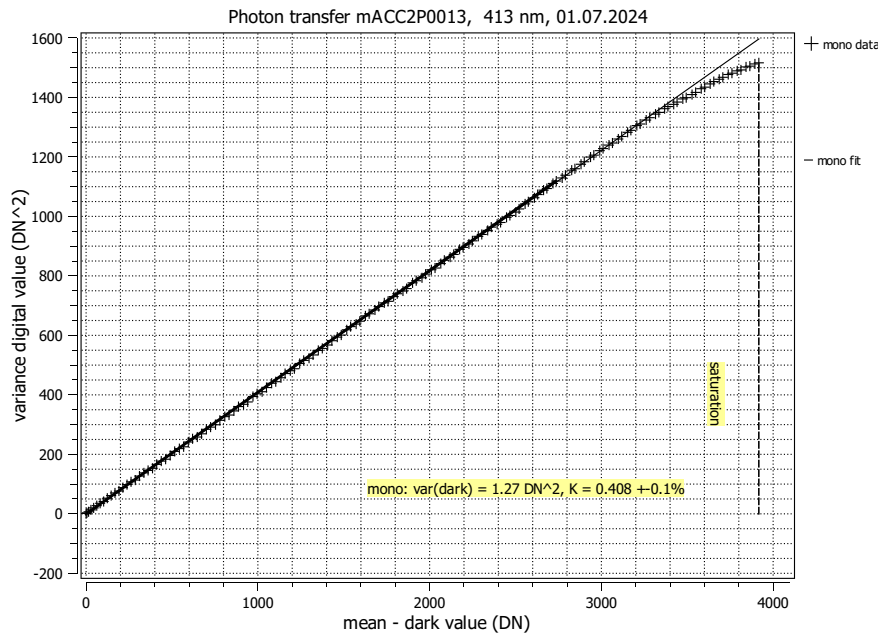
$\mu_{c,\text{mean}}$  — e<sup>-</sup>/s

$\mu_{c,\text{var}}$  — e<sup>-</sup>/s

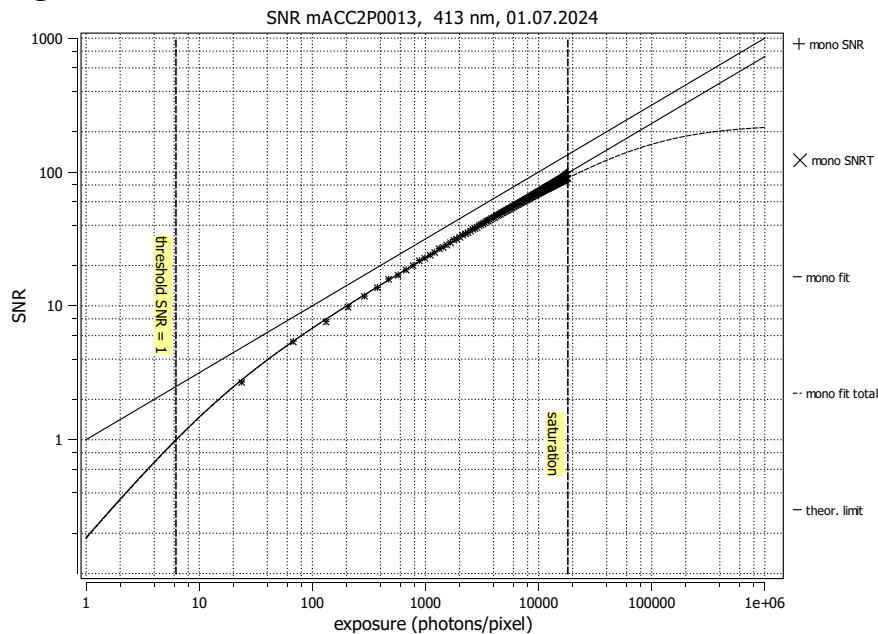
## Summary Sheet for Operation Point 3 at a Wavelength of 413 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	23.7°C
Exposure time	3.130 ms	Camera body temperature	37.6°C
Frame rate	10.0 Hz	Internal temperature(s)	0.0°C
Data transfer mode	Mono12	Wavelength, centr., FWHM	413 nm, 11.4 nm

### Photon Transfer



### Signal-to-Noise Ratio

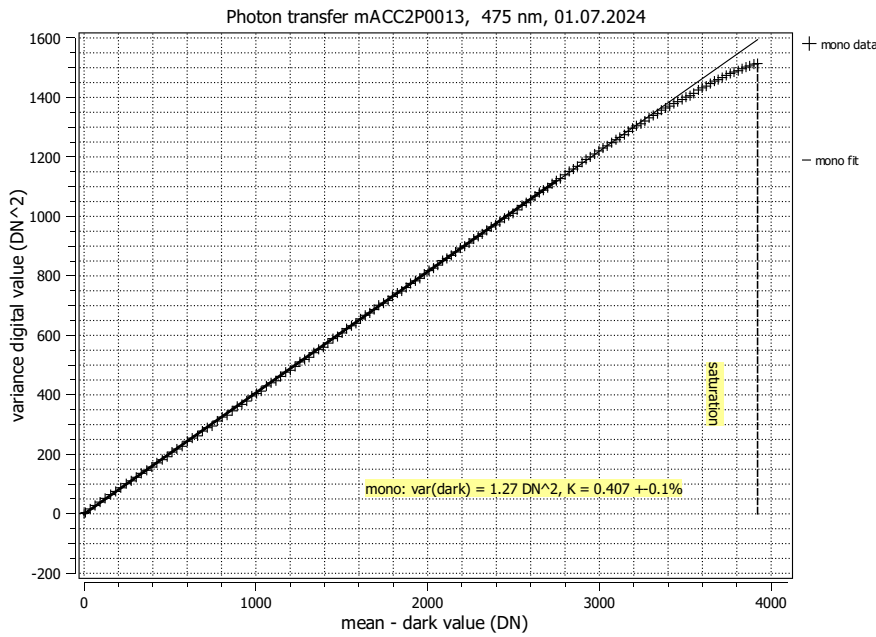


<b>Quantum efficiency</b>	
$\eta$	53.2%
<b>Overall system gain</b>	
$K$	0.4081 DN/e <sup>-</sup>
$1/K$	2.451 e <sup>-</sup> /DN
<b>Temporal dark noise</b>	
$\sigma_d$	2.67 e <sup>-</sup>
$\sigma_{y,\text{dark}}$	1.13 DN
<b>Signal-to-noise ratio</b>	
SNR <sub>max</sub>	98.2
	39.8 dB
$1/\text{SNR}_{\text{max}}$	1.018 %
<b>Absolute sensitivity threshold</b>	
$\mu_{e,\text{min}}$	3.31 e <sup>-</sup>
$\mu_{e,\text{min,area}}$	0.441 e <sup>-</sup> /μm <sup>2</sup>
<b>Saturation capacity</b>	
$\mu_{e,\text{sat}}$	9645 e <sup>-</sup>
$\mu_{e,\text{sat,area}}$	1285 e <sup>-</sup> /μm <sup>2</sup>
<b>Dynamic range</b>	
DR	2914
	69.29 dB
<b>Spatial nonuniformities</b>	
DSNU <sub>1288</sub>	0.474 e <sup>-</sup>
DSNU <sub>1288.col</sub>	0.019 e <sup>-</sup>
DSNU <sub>1288.row</sub>	0.020 e <sup>-</sup>
DSNU <sub>1288.pix</sub>	0.473 e <sup>-</sup>
PRNU <sub>1288</sub>	0.444 %
PRNU <sub>1288.col</sub>	0.060 %
PRNU <sub>1288.row</sub>	0.032 %
PRNU <sub>1288.pix</sub>	0.439 %
<b>Linearity error</b>	
LE	0.09%
<b>Dark current</b>	
$\mu_{c,\text{mean}}$	— e <sup>-</sup> /s
$\mu_{c,\text{var}}$	— e <sup>-</sup> /s

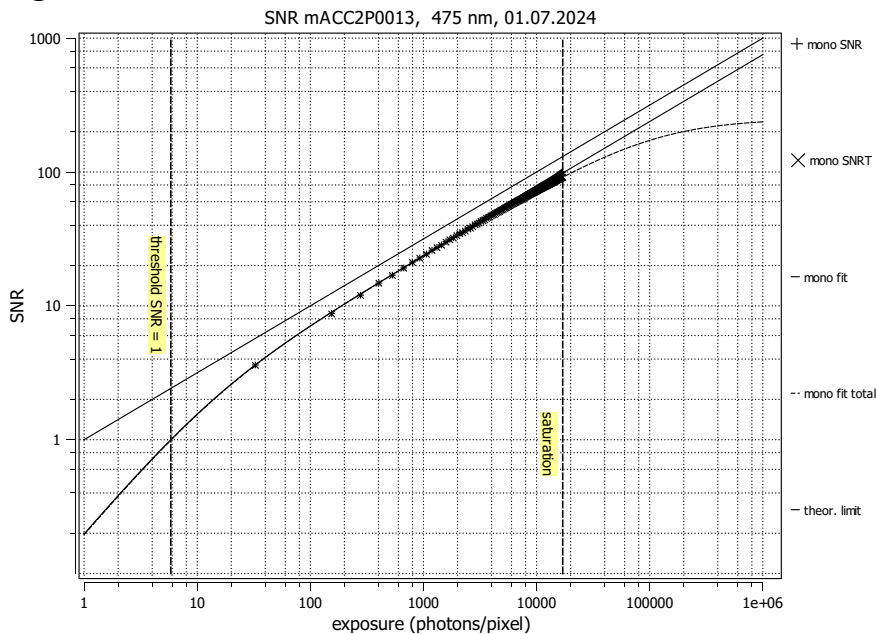
## Summary Sheet for Operation Point 4 at a Wavelength of 475 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	23.6°C
Exposure time	1.567 ms	Camera body temperature	37.6°C
Frame rate	10.0 Hz	Internal temperature(s)	0.0°C
Data transfer mode	Mono12	Wavelength, centr., FWHM	475 nm, 19.3 nm

### Photon Transfer



### Signal-to-Noise Ratio

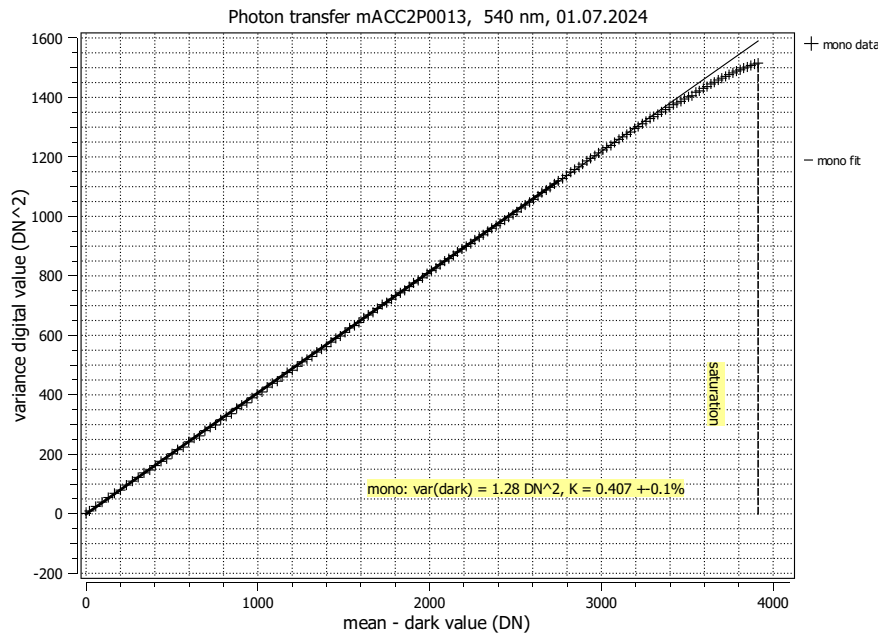


<b>Quantum efficiency</b>	
$\eta$	56.8%
<b>Overall system gain</b>	
$K$	0.4071 DN/e <sup>-</sup>
$1/K$	2.457 e <sup>-</sup> /DN
<b>Temporal dark noise</b>	
$\sigma_d$	2.68 e <sup>-</sup>
$\sigma_{y,\text{dark}}$	1.13 DN
<b>Signal-to-noise ratio</b>	
SNR <sub>max</sub>	98.3
	39.9 dB
$1/\text{SNR}_{\text{max}}$	1.017 %
<b>Absolute sensitivity threshold</b>	
$\mu_{e,\text{min}}$	3.32 e <sup>-</sup>
$\mu_{e,\text{min,area}}$	0.442 e <sup>-</sup> /μm <sup>2</sup>
<b>Saturation capacity</b>	
$\mu_{e,\text{sat}}$	9668 e <sup>-</sup>
$\mu_{e,\text{sat,area}}$	1288 e <sup>-</sup> /μm <sup>2</sup>
<b>Dynamic range</b>	
DR	2916
	69.30 dB
<b>Spatial nonuniformities</b>	
DSNU <sub>1288</sub>	0.473 e <sup>-</sup>
DSNU <sub>1288,col</sub>	0.019 e <sup>-</sup>
DSNU <sub>1288,row</sub>	0.020 e <sup>-</sup>
DSNU <sub>1288,pix</sub>	0.472 e <sup>-</sup>
PRNU <sub>1288</sub>	0.401 %
PRNU <sub>1288,col</sub>	0.048 %
PRNU <sub>1288,row</sub>	0.025 %
PRNU <sub>1288,pix</sub>	0.397 %
<b>Linearity error</b>	
LE	0.05%
<b>Dark current</b>	
$\mu_{c,\text{mean}}$	— e <sup>-</sup> /s
$\mu_{c,\text{var}}$	— e <sup>-</sup> /s

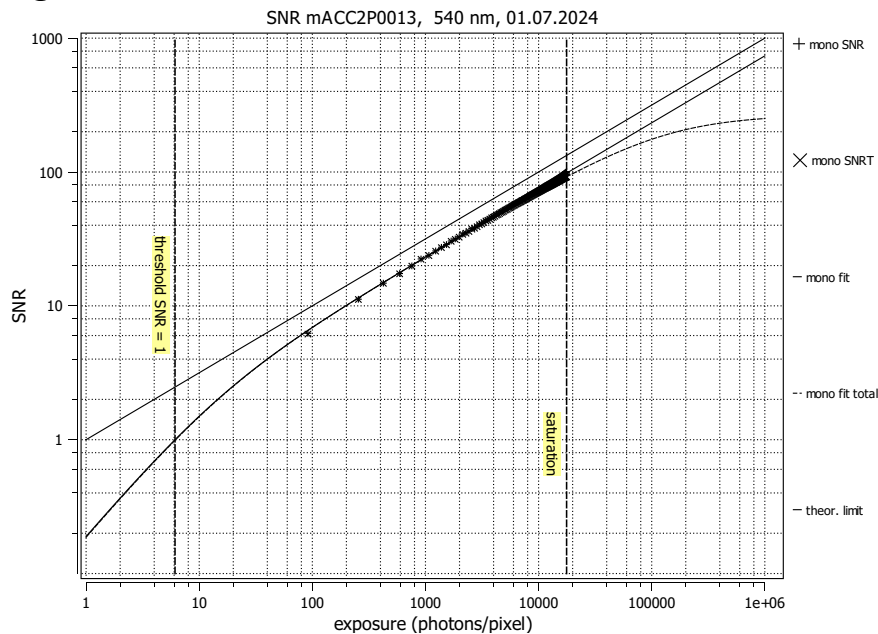
## Summary Sheet for Operation Point 5 at a Wavelength of 540 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	23.6°C
Exposure time	3.130 ms	Camera body temperature	37.6°C
Frame rate	10.0 Hz	Internal temperature(s)	0.0°C
Data transfer mode	Mono12	Wavelength, centr., FWHM	540 nm, 34.6 nm

### Photon Transfer



### Signal-to-Noise Ratio



<b>Quantum efficiency</b>	
$\eta$	54.4%
<b>Overall system gain</b>	
$K$	0.4068 DN/e <sup>-</sup>
$1/K$	2.458 e <sup>-</sup> /DN
<b>Temporal dark noise</b>	
$\sigma_d$	2.69 e <sup>-</sup>
$\sigma_{y,\text{dark}}$	1.13 DN
<b>Signal-to-noise ratio</b>	
SNR <sub>max</sub>	98.1
	39.8 dB
$1/\text{SNR}_{\text{max}}$	1.020 %
<b>Absolute sensitivity threshold</b>	
$\mu_{e,\text{min}}$	3.32 e <sup>-</sup>
$\mu_{e,\text{min,area}}$	0.442 e <sup>-</sup> /μm <sup>2</sup>
<b>Saturation capacity</b>	
$\mu_{e,\text{sat}}$	9617 e <sup>-</sup>
$\mu_{e,\text{sat,area}}$	1281 e <sup>-</sup> /μm <sup>2</sup>
<b>Dynamic range</b>	
DR	2895
	69.23 dB
<b>Spatial nonuniformities</b>	
DSNU <sub>1288</sub>	0.476 e <sup>-</sup>
DSNU <sub>1288,col</sub>	0.020 e <sup>-</sup>
DSNU <sub>1288,row</sub>	0.019 e <sup>-</sup>
DSNU <sub>1288,pix</sub>	0.475 e <sup>-</sup>
PRNU <sub>1288</sub>	0.375 %
PRNU <sub>1288,col</sub>	0.023 %
PRNU <sub>1288,row</sub>	0.026 %
PRNU <sub>1288,pix</sub>	0.373 %
<b>Linearity error</b>	
LE	0.10%
<b>Dark current</b>	
$\mu_{c,\text{mean}}$	8.20 e <sup>-</sup> /s
$\mu_{c,\text{var}}$	12.4 e <sup>-</sup> /s