EMVA 1288 Datasheet

This datasheet describes the specification according to the standard 1288 Standard for Characterization and Presentation of Specification Data for Image Sensors and Cameras of European Machine Vision Association (EMVA) (See www.standard1288.org).

Vendor	KAYA Instruments	Sensor	IMX253
Model	Iron253M	Sensor type	CMOS
Camera type	Monochrome	Shutter type	Global
Data type	Single	Overlap capabilities	Overlapping
Sensor type	CMOS	Frame rate	28 Hz
Lens category	C-Mount	Exposure control	by irradiance
Resolution	4096 x 3000 ,12 bits	Exposure time	6000.1328 μs
Pixel size	3.45μm x 3.45μm	Illumination	Variable with constant exposure time
Maximum readout rate	28 fps	Irradiation Steps	50
Dark current compensation	No	Irradiation calibration accuracy	-
Interface type	CXP-12	Irradiation measurement error	-
Serial number	1320003	Standart version	3.1
Firmware version	3.1-2020.4.13	Light source	Integrating Sphere
Sensor diagonal	16.1mm		

International Distributor

sky blue microsystems

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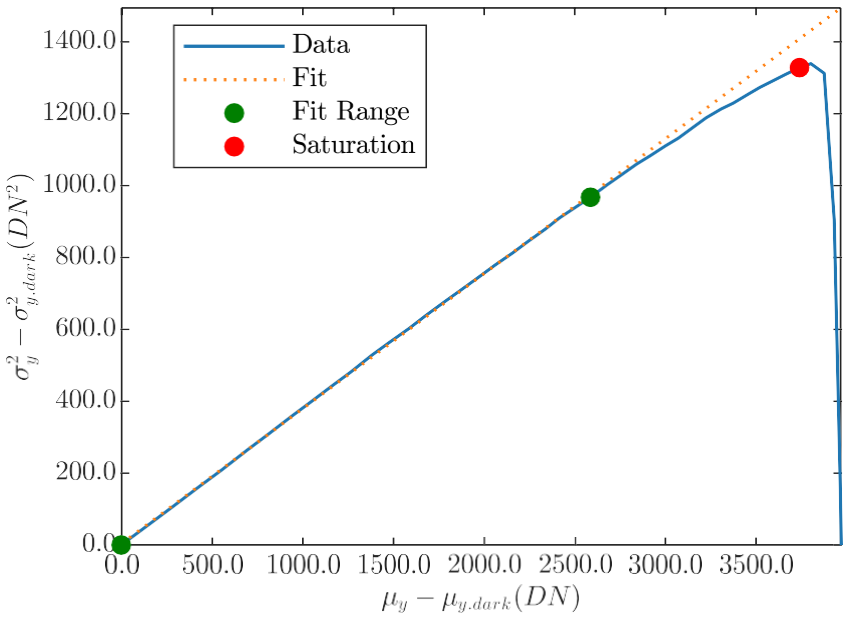
www.skyblue.de

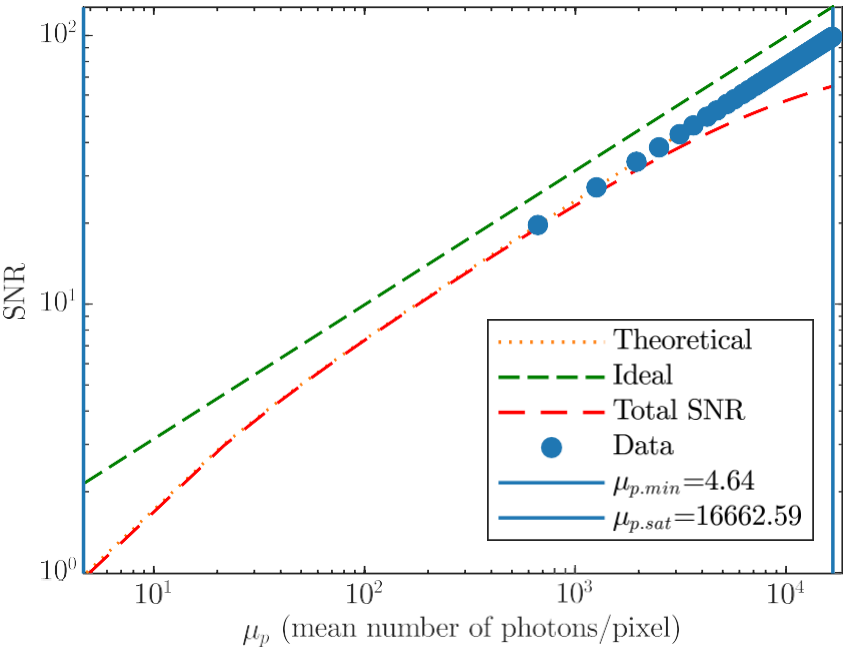
Summary Sheet for Operation Point 1 at a Wavelength of 520 nm

Camera setting		Operation point parameters	
Gain	GainLevelx1	Environmental temperature	2.87
Black level	128	Camera body temperature	30
		Sensor temperature	29.256
		Processor temperature	35

Photon Transfer



Signal-to-Noise Ratio



Performance

Quantum efficiency

η	59.9809	%

System gain

K	0.37613	DN/e⁻
1/K	2.6586	e⁻/DN

Temporal dark noise

σ_d	2.1521	e⁻
$\sigma_{y.dark}$	0.85942	DN

Signal-to-noise ratio

SNR_{max}	99.9719	
	39.9976	dB
	6.6435	bit
$1/SNR_{max}$	1.0003	%

Absolute sensitivity threshold

$\mu_{p.min}$	4.6429	p
$\mu_{p.min.area}$	0.39008	p/μm^2
$\mu_{e.min}$	2.7849	e⁻
$\mu_{e.min.area}$	0.23397	e⁻/μm^2

Saturation capacity

$\mu_{p.sat}$	16662.5857	p
$\mu_{p.sat.area}$	1399.9232	p/μm^2
$\mu_{e.sat}$	9994.3741	e⁻
$\mu_{e.sat.area}$	839.687	e⁻/μm^2

Dynamic range

DR	3588.7932	
	71.099	dB
	11.8093	bit

Spatial nonuniformities

$DSNU_{1288}$	0.66954	e⁻
	0.25184	DN
$PRNU_{1288}$	1.1685	%

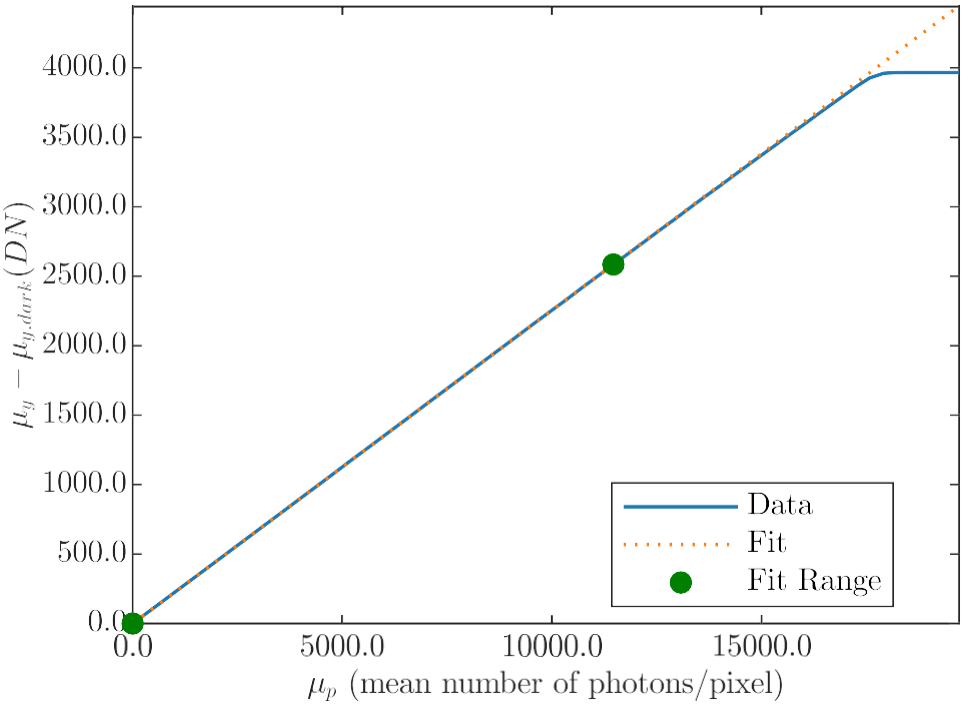
Linearity error

LE_{min}	-0.31537	%
LE_{max}	0.17683	%

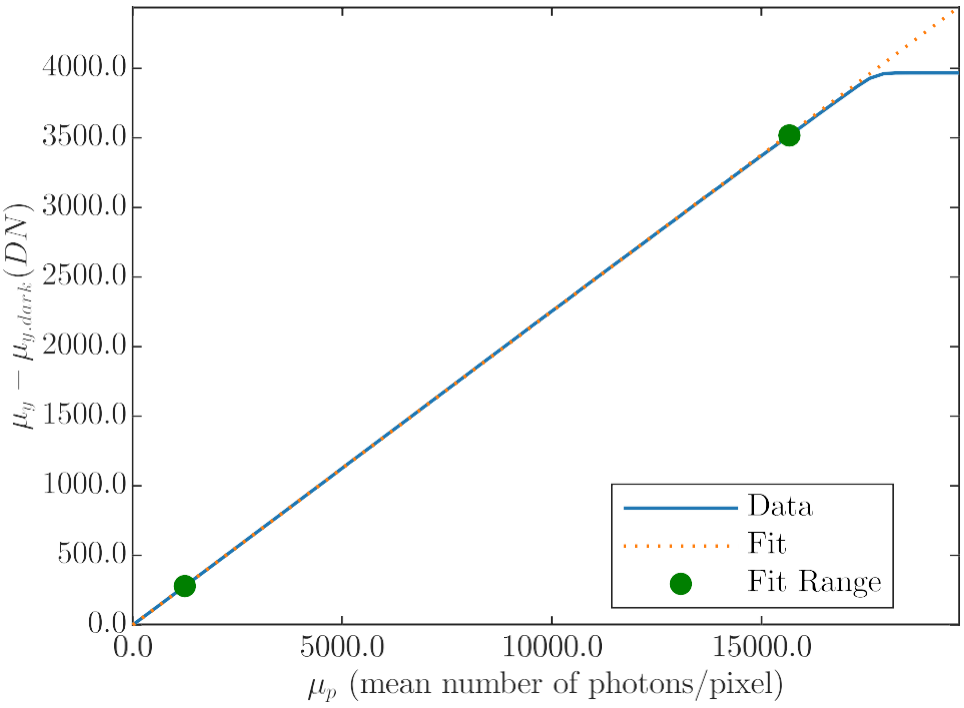
Dark current

$\mu_{I.mean}$	8.1674	e⁻/s
	3.072	DN/s
$\mu_{I.var}$	3.5006	e⁻/s
	0.49525	DN/s

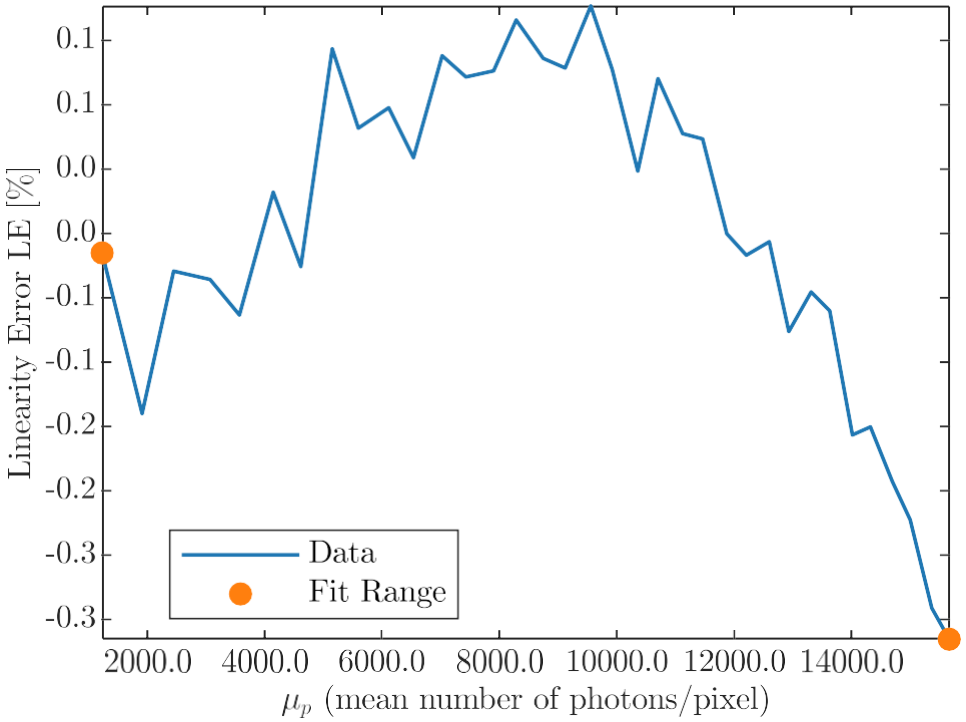
Sensitivity



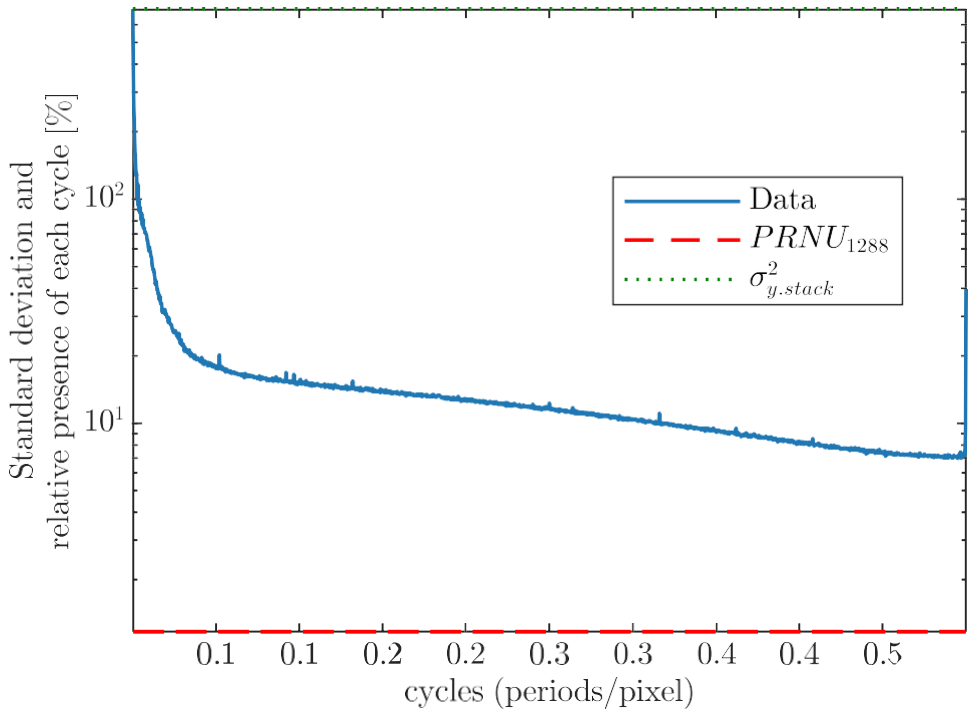
Linearity



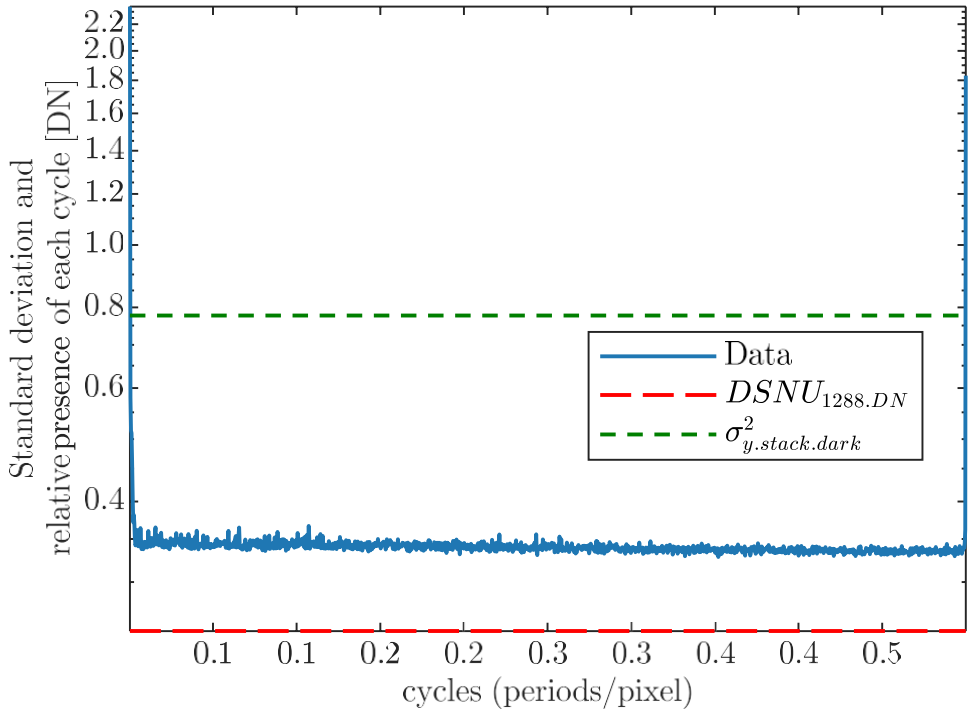
Deviation Linearity



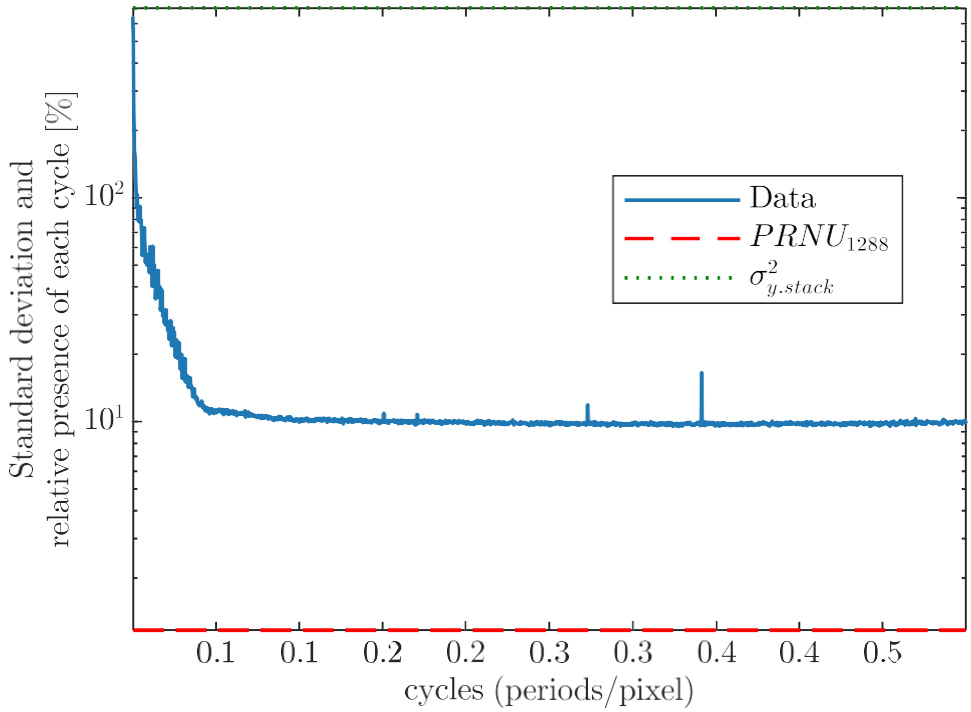
Horizontal Spectrogram PRNU



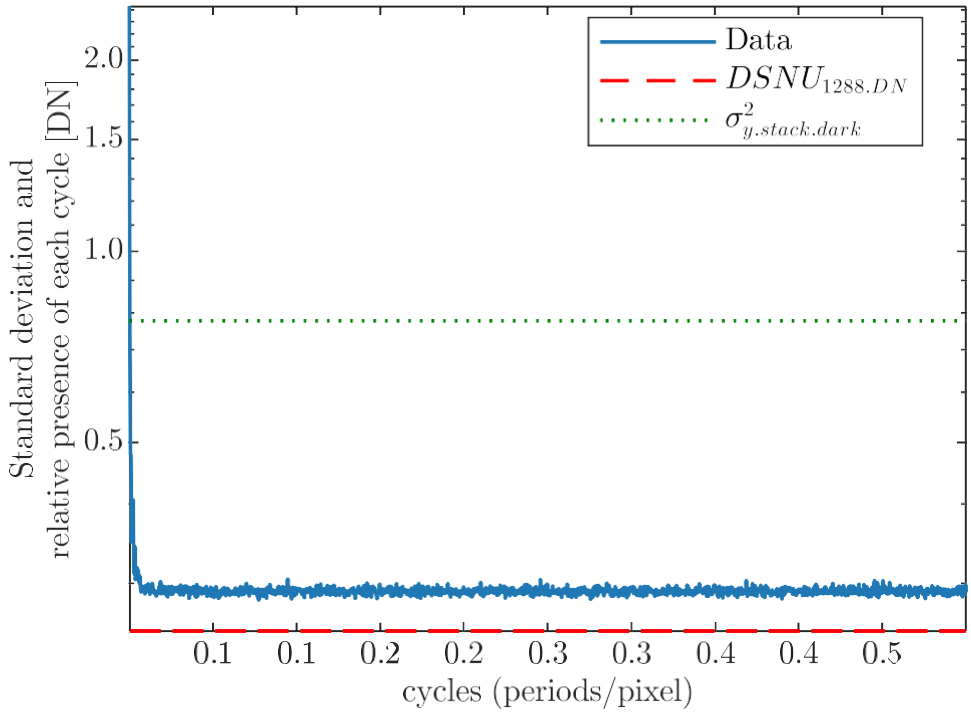
Horizontal Spectrogram DSNU



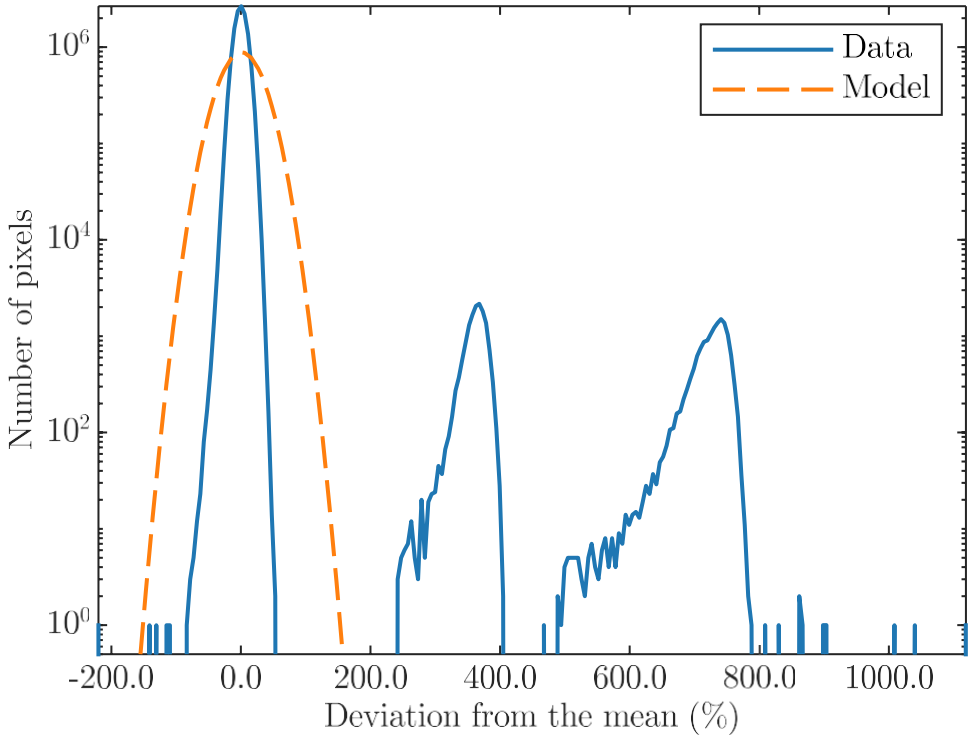
Vertical Spectrogram PRNU



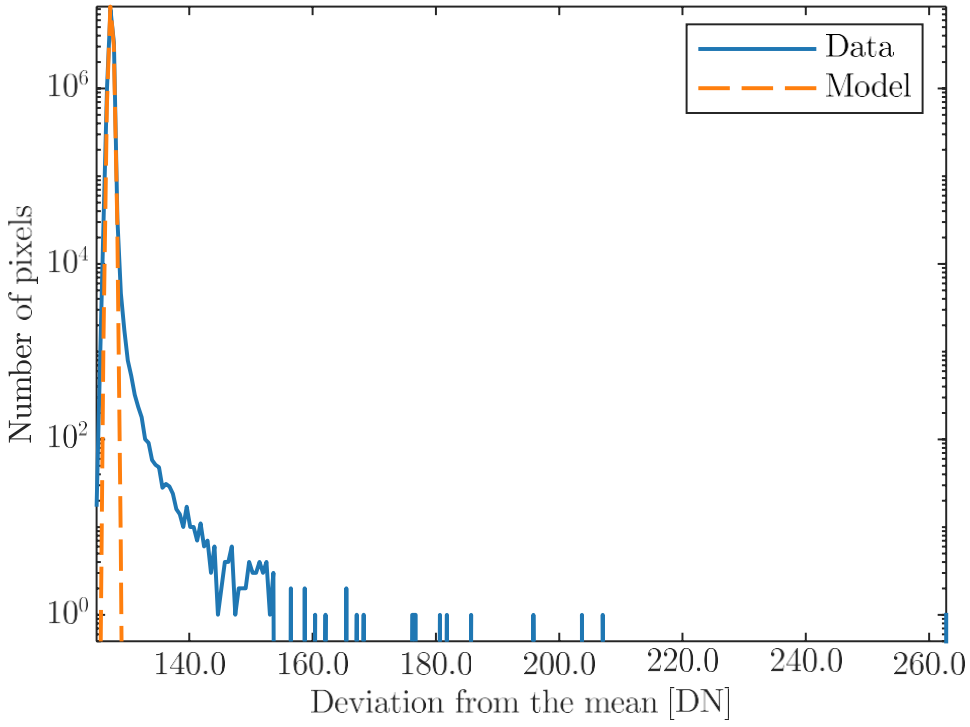
Vertical Spectrogram DSNU



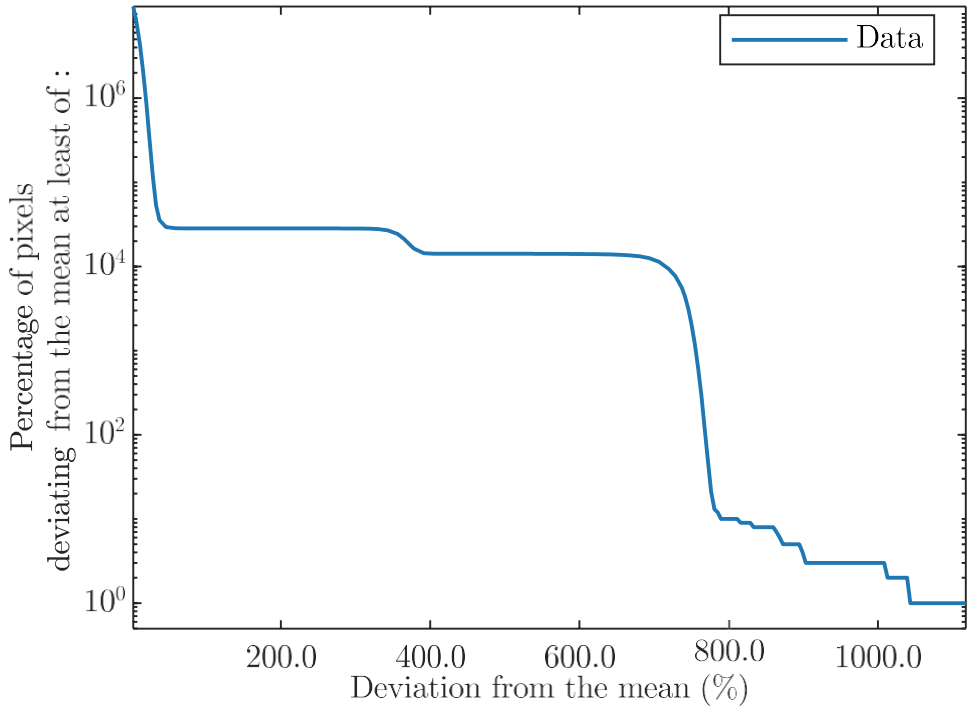
Logarithmic Histogram PRNU



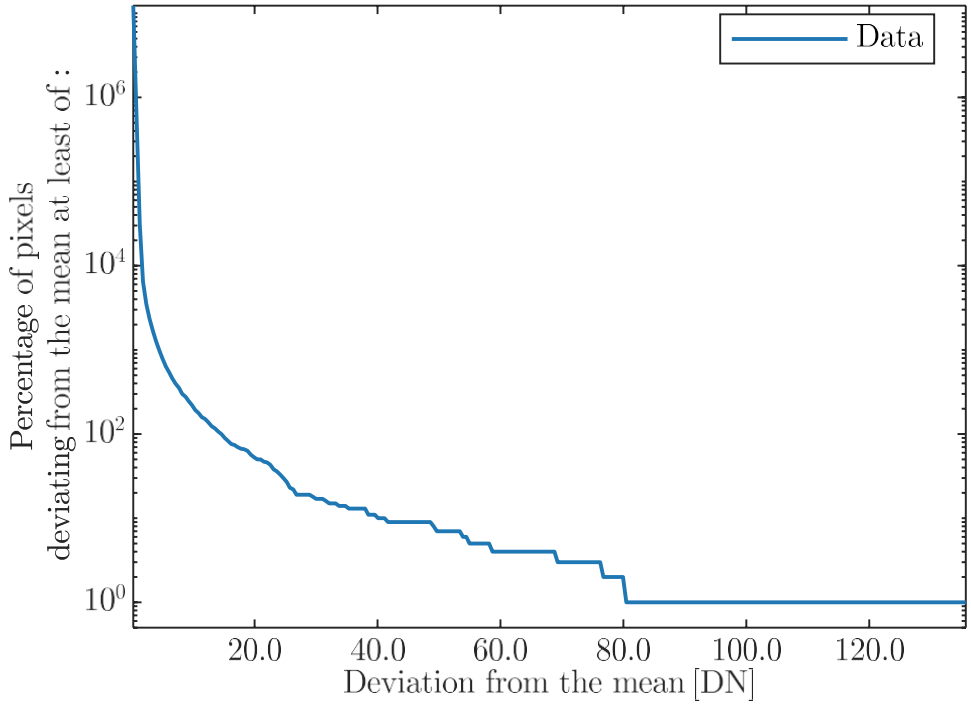
Logarithmic Histogram DSNU



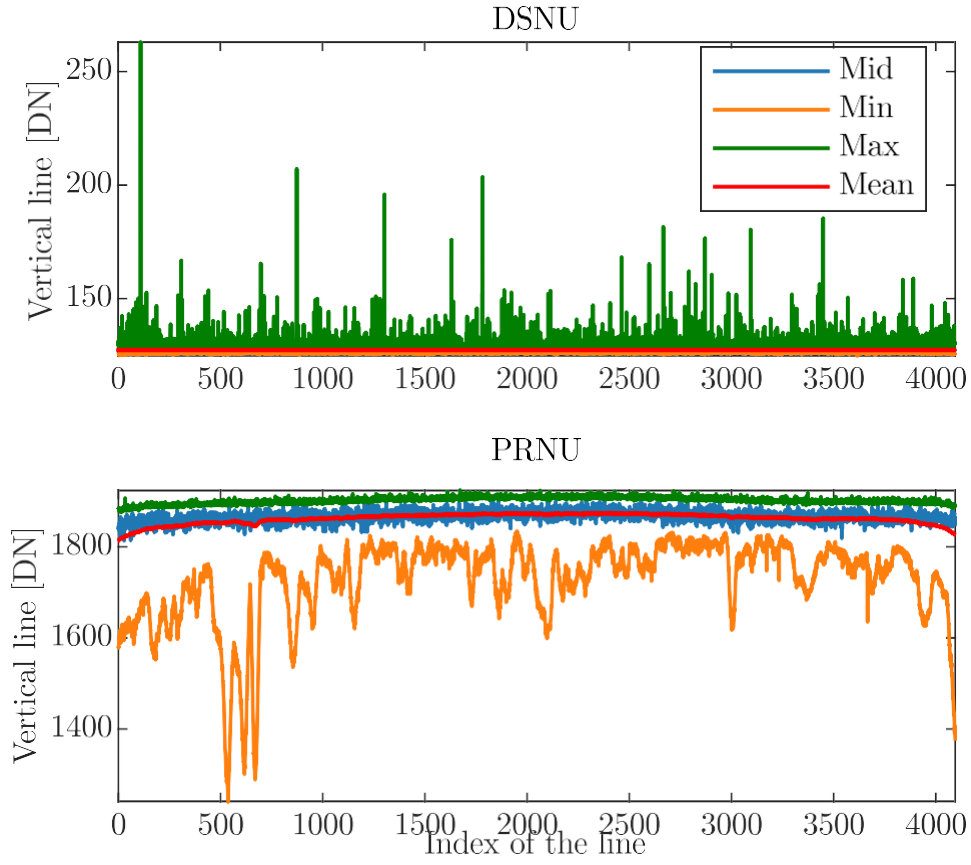
Accumulated Log Histogram PRNU



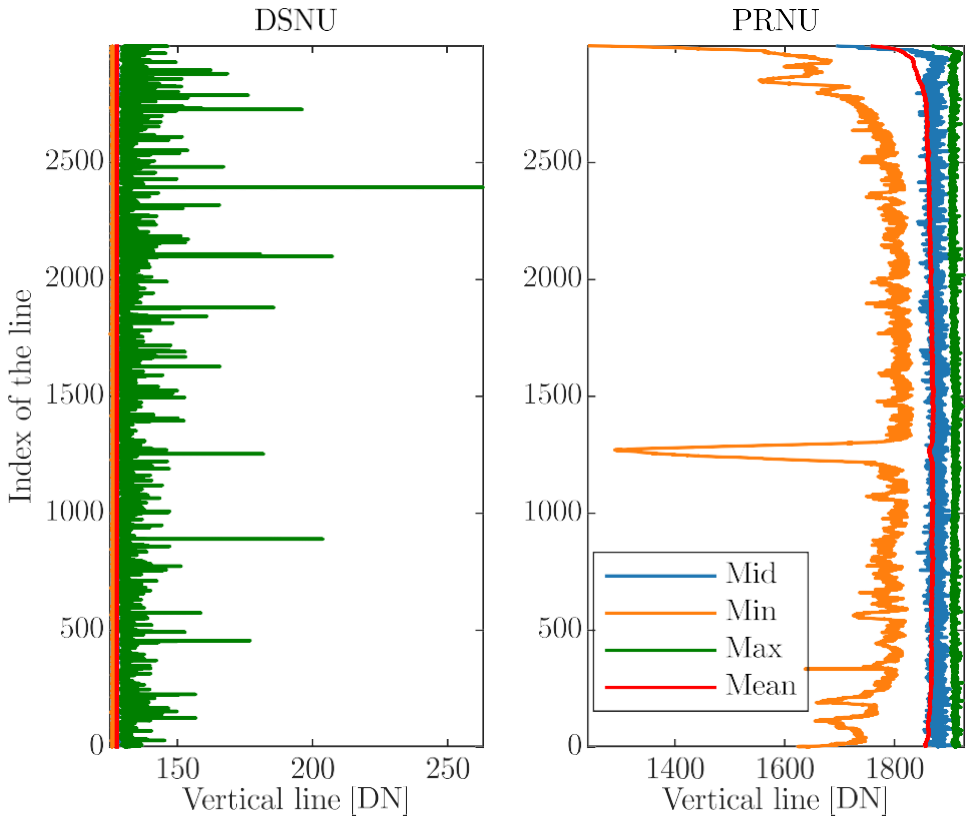
Accumulated Log Histogram DSNU



Horizontal Profile

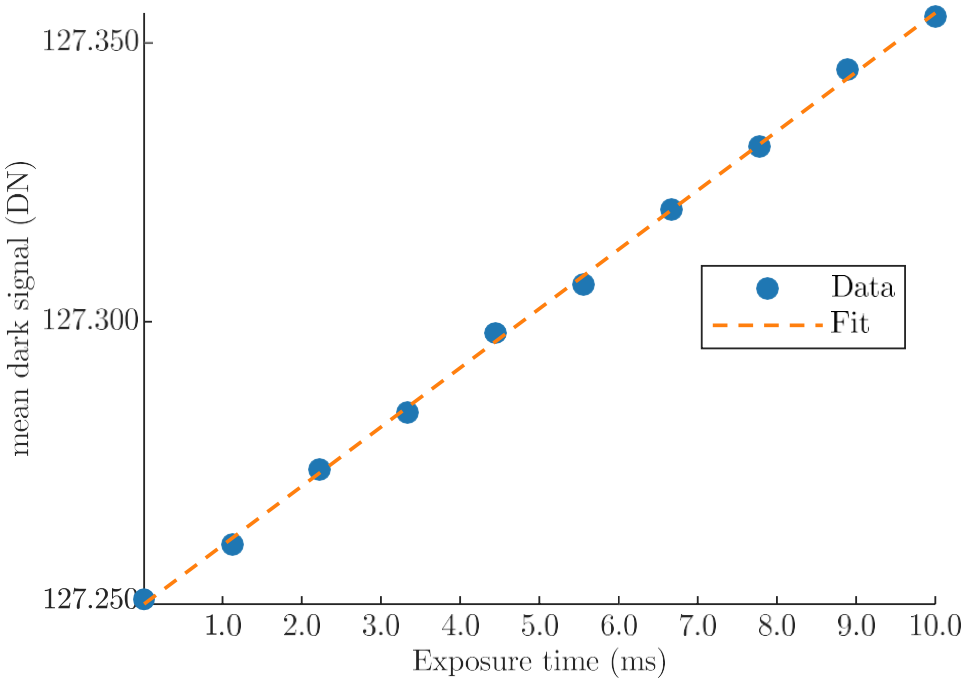


Vertical Profile

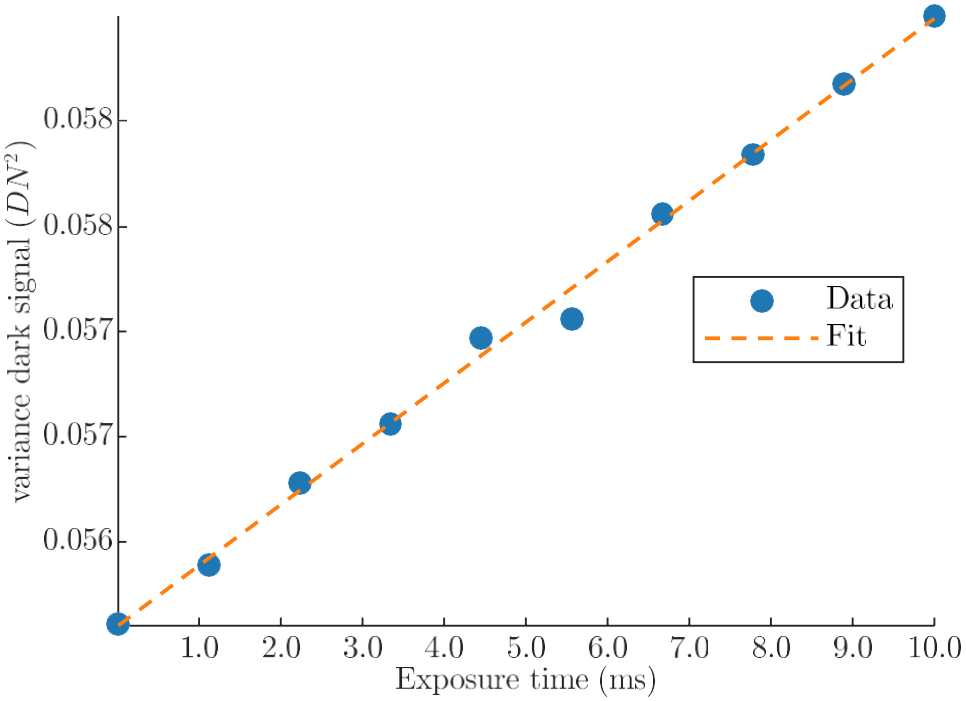


Dark Current

Dark Current from Mean



Dark Current from Variance



Acceptance Test Result (Not part of EMVA1288 standard)

Test Date 17-Nov-2020 12:10:14
Tester Name Tester

Table 1: Acceptance test summary (Not part of EMVA1288 standard)

Test Number	Test Name	Test Status	Numeric Value	Margins	Failure Description
1	Dead Pixels	Pass	0	≤ 10	
2	Dead Clusters	Pass	0	≤ 0	
3	QE	Pass	60.0	≥ 55	
4	SNR	Pass	40.0	≥ 38	
5	DR	Pass	71.1	≥ 67	
6	Flash	Pass	-	-	
7	Uart	Pass	-	-	
8	SensorControl	Pass	-	-	
9	SensorLVDS	Pass	-	-	
10	Temperature	Pass	-	-	
11	Voltages	Pass	-	-	
12	MACOM	Pass	-	-	
13	GPIO	Pass	-	-	
14	DRAM	Pass	-	-	

Table 2: Dead pixels summary (Not part of EMVA1288 standard)

Number	Column	Row	Deviation from mean DSNU [DN]	Deviation from mean PRNU [%]
-	-	-	-	-

Summary Sheet for calibration of User Set Factory (Not part of EMVA1288 standard)

Camera setting		Operation point parameters	
Gain	GainLevelx1	Environmental temperature	2.87
Black level	128	Camera body temperature	2.87
Frame rate	28 Hz	Sensor temperature	29.256
Exposure time	6000.1328 μs		

Spectrum of Calibration light source

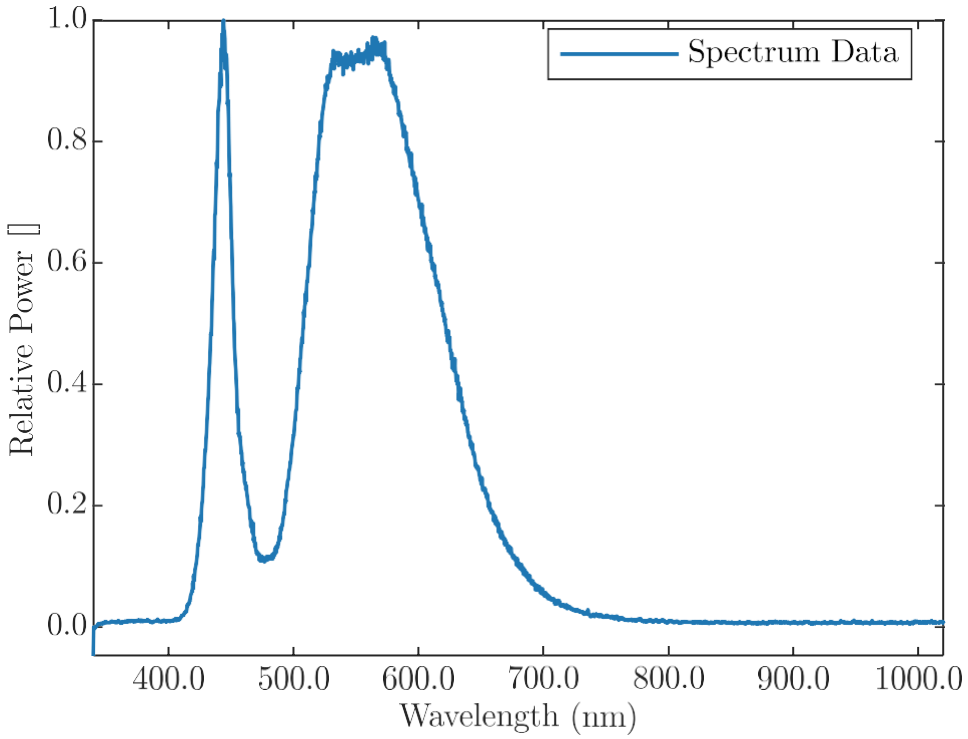


Table 3: Calibrated features summary

Number	Feature	Calibration Status
1	DSNU	Yes
2	PRNU	Yes
3	Bad Pixels	Yes

Dead Pixels

Table 4: Dead pixels summary

Number	Column	Row	Deviation from mean DSNU [DN]	Deviation from mean PRNU [%]
-	-	-	-	-