



## Calibration Certificate

N<sup>o</sup> 00117314

Object                    Digital Aerial Survey Camera  
Manufacturer            Z/I Imaging D-73431 Aalen  
Type                      DMC-Panchromatic  
Serial Number            00117314

Calibration performed at:  
Carl Zeiss Jena

Number of pages of the certificate      7

Date of Calibration                        02.Sep.2008

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Certified	Date	Division Head	Person in Charge
	12.Sep.2008	(H. Sohnle)	(S. Schröder)

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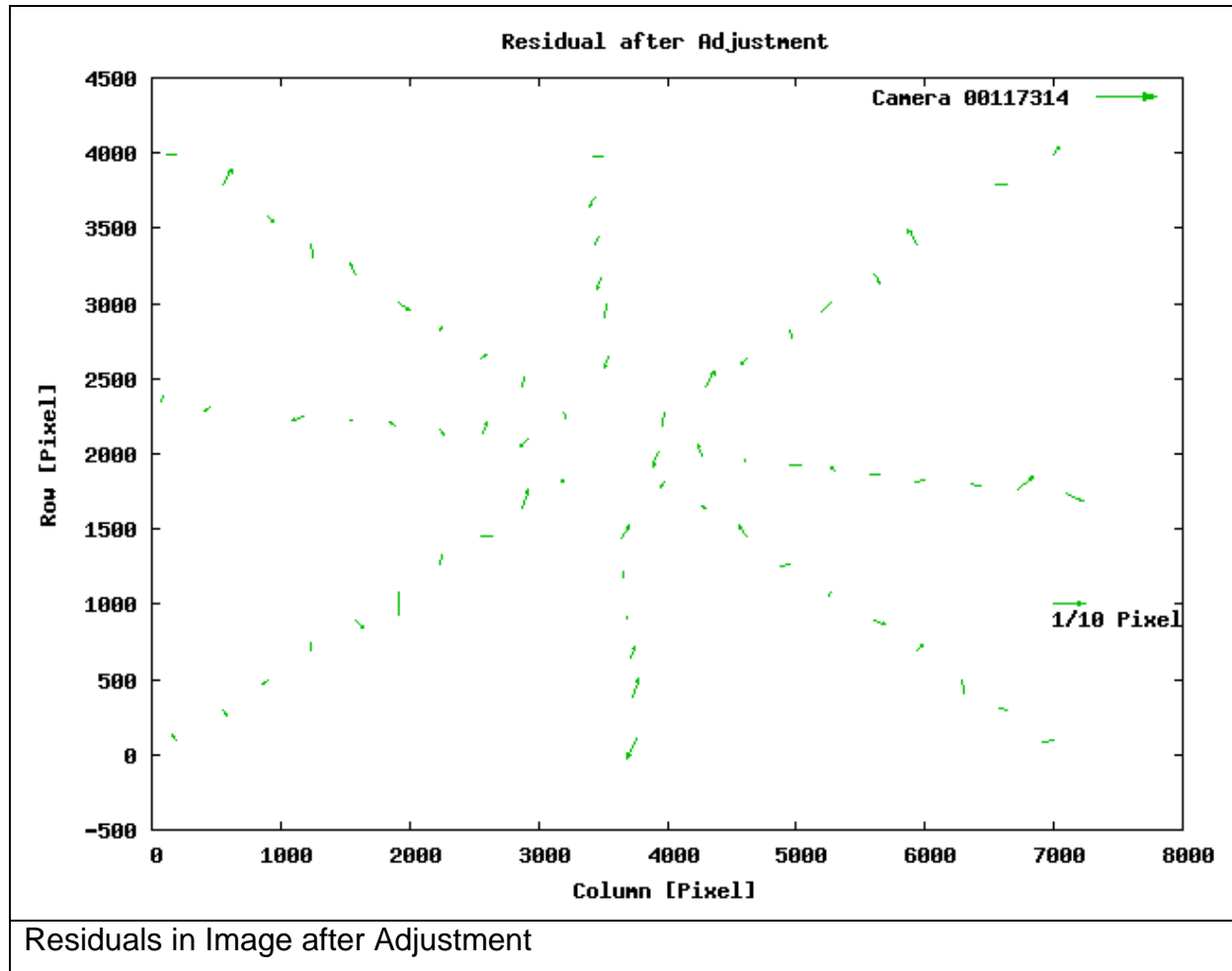
# Geometric Calibration Protocol

## Calibration Parameters for single camera head

Camera Type	DMC-Panchromatic
Nominal Focal Length	0.12 m
Serial Number	00117314

	Param	Adjusted	Std.dev.
Principal Point [m]	$x_0$	4.54E-05	5.764E-06
	$y_0$	5.339E-05	3.477E-06
Focal Length [m]	$\Delta f$	-0.0004738	1.006E-06
Radial Distortion	$K_1$	0.8374	0.02579
	$K_2$	-400.4	23.23
	$K_3$	1217	6116
Decentering distortion	$P_1$	-0.000471	0.0001314
	$P_2$	0.0003039	6.582E-05
In Plane Distortion	$B_1$	-2.508E-06	6.682E-06
	$B_2$	-1.592E-05	3.838E-06

Adjusted Focal length = 0.12+ dc =0.1195262 [m]



Max Residual [ $\mu\text{m}$ ]: 0.8

Threshold [ $\mu\text{m}$ ]: 8.5

Remarks:

The images after the post processing are distortion free. For interior orientation parameters of the DMC virtual image see section: "Calibration Parameter of the virtual images".

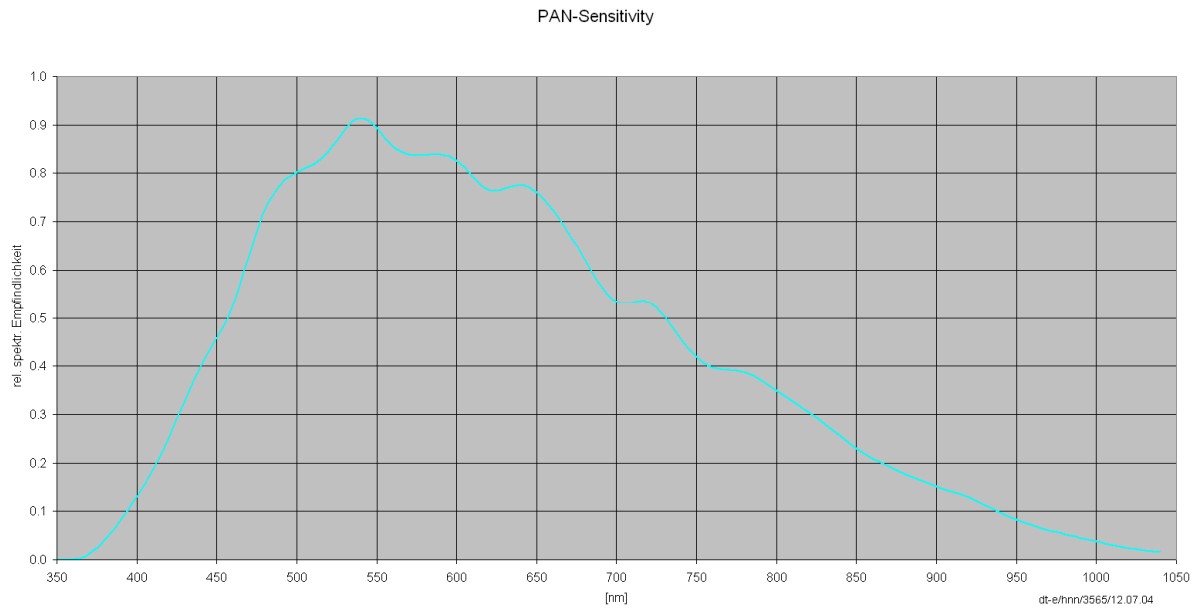
The calibration model is explained in the section "Calibration Model" at the end of this documentation.

## Radiometric Calibration Protocol

In this section you'll find the radiometric calibration results.

Camera ID	00117314
Sensor Revision Number	2
Lens Revision Number	1
Filter Revision Number	-
Aperture Revision Number	1

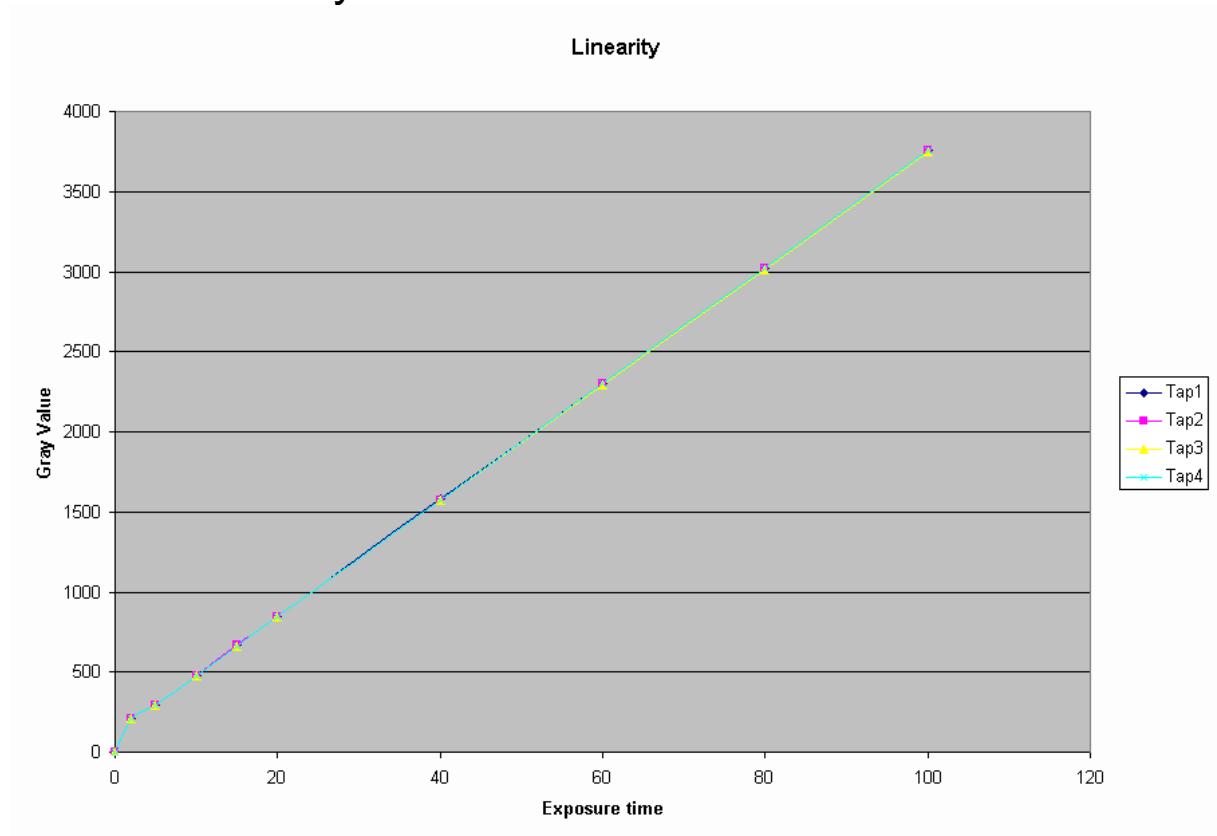
# Sensitivity of camera



**Remark:**

Measurement is done without the influence of the shutter and the Analog/Digital converter. This graph is similar for the same lens and filter revision numbers. For more details see Appendix: "Radiometric Calibration Model".

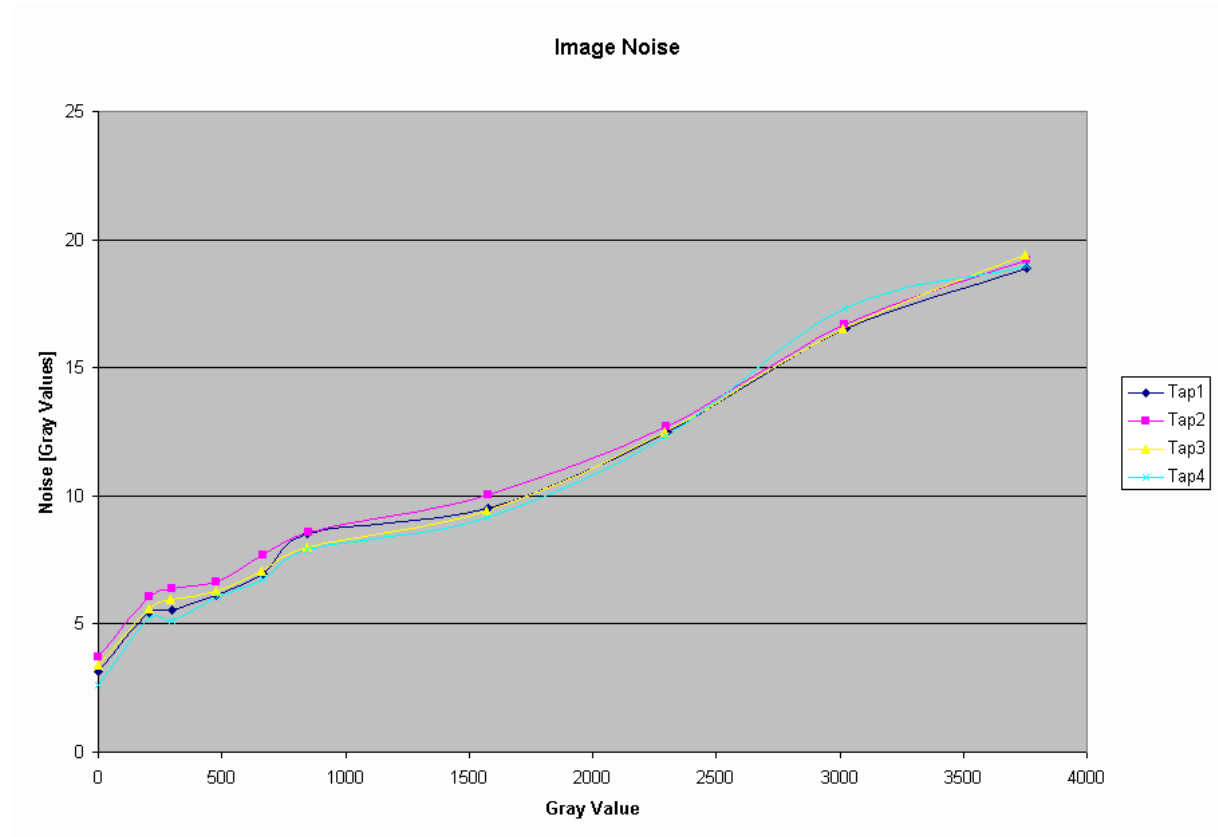
# Sensor Linearity



**Remark:**

The sensor linearity is measured for each camera. For more details see Appendix: "Radiometric Calibration Model".

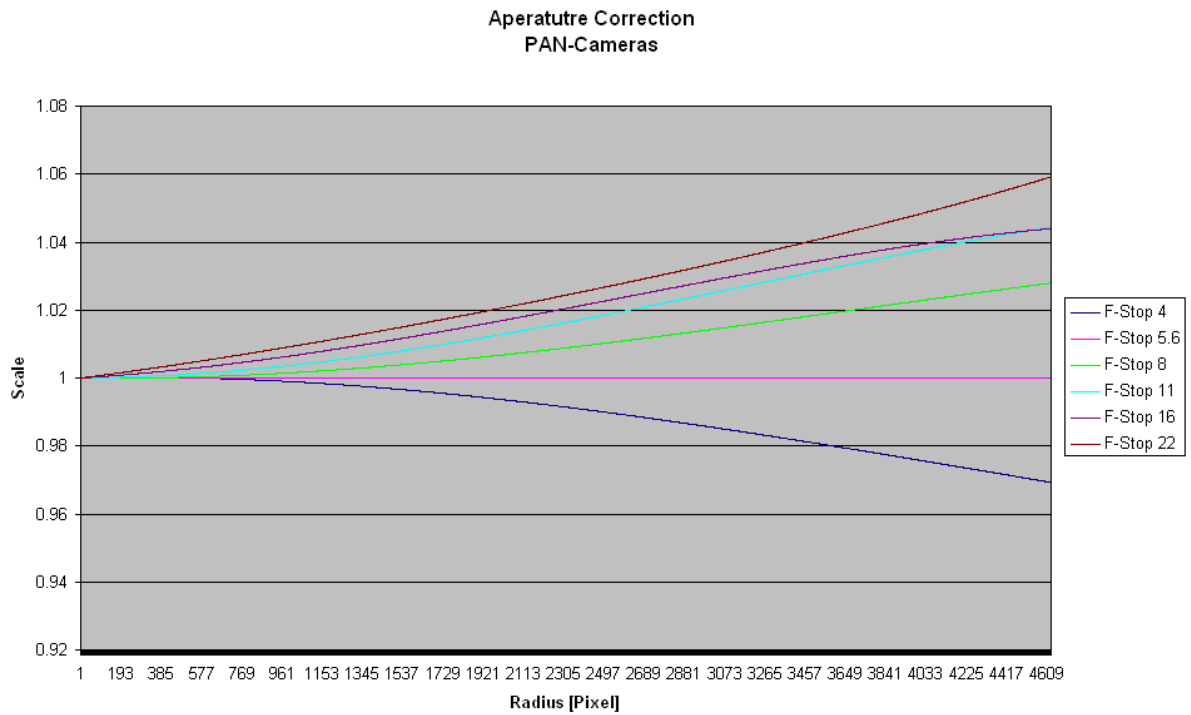
## Sensor Noise



**Remark:**

The sensor noise is measured for each camera. For more details see Appendix: "Radiometric Calibration Model".

## Aperture Correction



### Remark:

This measurement is similar for the same aperture revision number. For more details see Appendix: "Radiometric Calibration Model".

## Defect Pixel List

Number of defect pixels: 7

Number of defect clusters: 0

Number of defect columns: 0

Nr	Row	Column
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0	3623	1545
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1	3624	1545
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2	3623	1546
---	------	------

3	3624	1546
---	------	------

4	3625	1546
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5	3623	1547
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6	3624	1547
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Defect Column	RowStart	ColumnStart	RowEnd	ColumnEnd
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Remark

See Appendix for definition of defect pixels and maximal allowed numbers.