

Outline

- Introduction
- Linearity
- Temperature stability
- Bias appearance
- Conclusion

Introduction

- Market for DSLR (digital single-lens reflex) cameras Professional photographs:
 - Documentation
 - Aesthetic
- Hardware is improved every year
- Scientifically useable?
- Useable as digitalization tool?

Introduction

- DSLR specifications:
 - Resolution: up to 36 Mpx
 - Pixel size: 4-9 μm
 - Bit depth: 12 14 in RAW
 - ISO sensitivity: 50 250 000
 - Exposures: 1/8000 30 s
- Many parameters similar to professional cameras
- Many functions that are unnecessary

- First condition for preciseness estimation
- Measured on ISO 14524 patch
- Original method changed due strange response of cameras

- Maximal exposure to saturation was estimated
- 3 series from maximal to minimal saturation taken
- Middle 64 x 64 pixels measured
- Then values for each exposure setting were averaged





Residuals after linear approximation compared with respective digital output values

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Temperature stability

- Noise level is in theory affected by temperature
- Most of scientific cameras have temperature stabilization
- How DSLRs heats itself?
- How DSLRs deals with variation of temperature?
- Set of 60 images with one minute exposures taken
- Canon cameras have temperature sensor
- SW Dark library

Temperature stability

• Preprocessing is clearly visible

Temperature stability

• Preprocessing visible even more

Bias appearance

- Different approach to offset handling
- Nikon damage noise information

Conclusion

- Booth brands linear in certain range
- Problematic temperature stability
- Noise handling is problematic too (Nikon)
- Despite these problems DSLRs are useable if you take this behavior into account (many cons)
- TODO list:
 - more properties will be measured
 - measure this properties on scanners

Thank you for your attention