



Royal Netherlands  
Meteorological Institute  
*Ministry of Infrastructure and the  
Environment*

# OMI and AURA

## In-flight Calibration Data Analysis

MOWG

College Park, September 16,  
2014





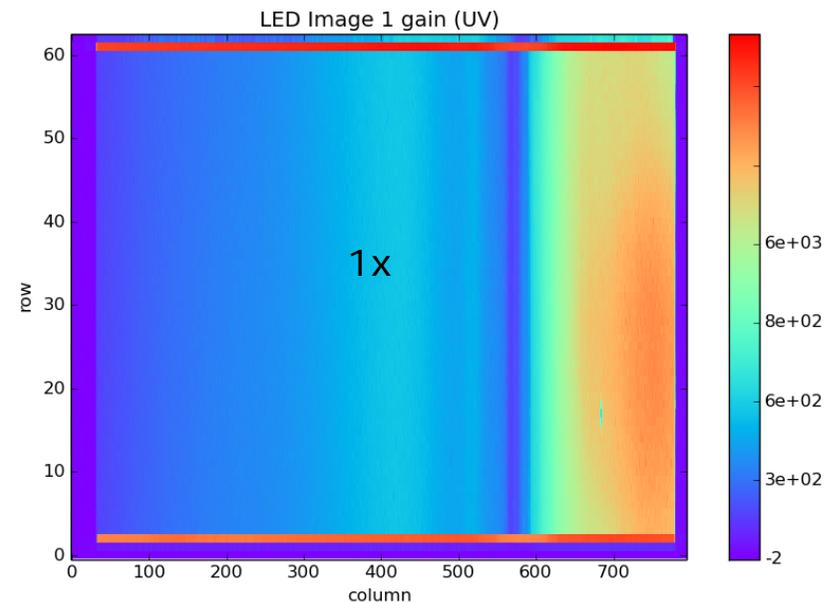
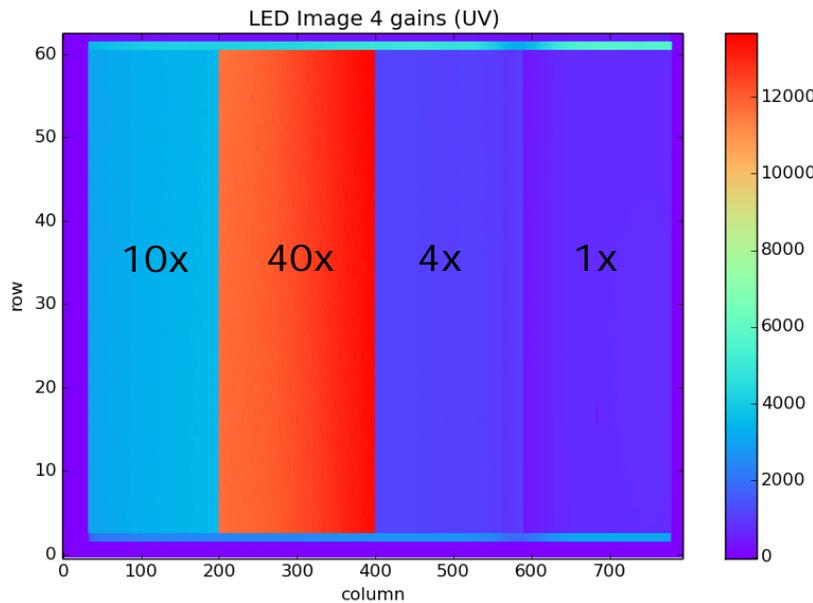
## OMI In-flight Calibration Data Analysis

- 10 years of OMI in-flight calibration data
- Look for trends in calibration parameters
- Purpose: prepare for potential reprocessing of OMI Level 0 data
  
- Current work is focused on detector characteristics:
  - Gain ratios
  - Electronic offset



# Gain ratio analysis

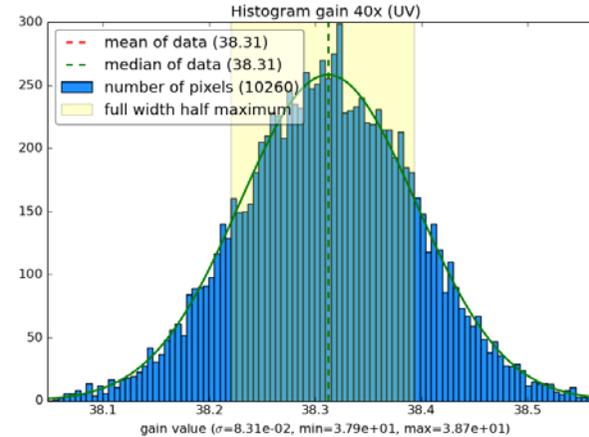
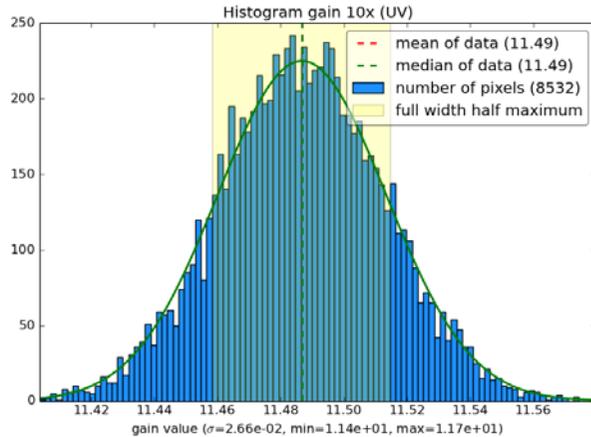
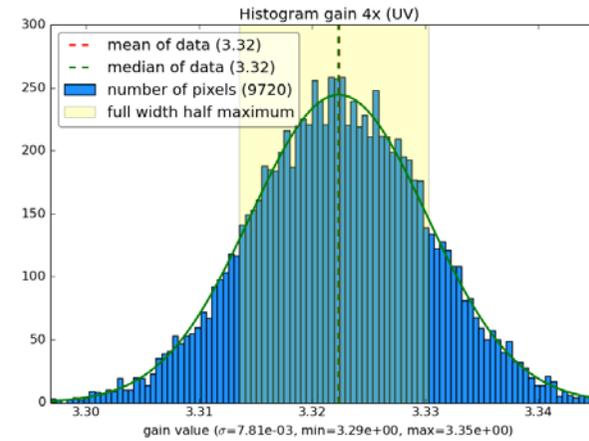
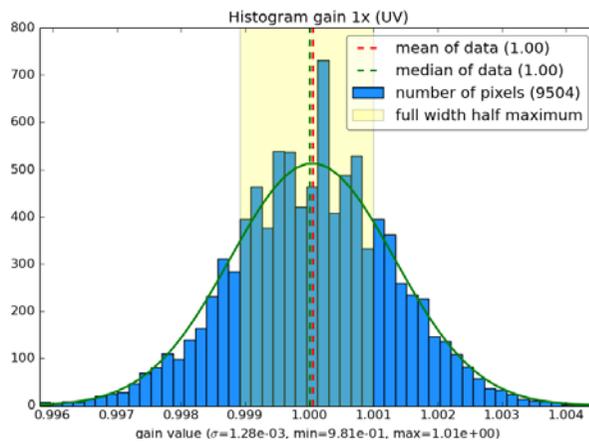
Input for analysis: LED images with 4 gains and 1 gain  
Inputfile from orbit 52640, June 8, 2014





# Gain ratio analysis

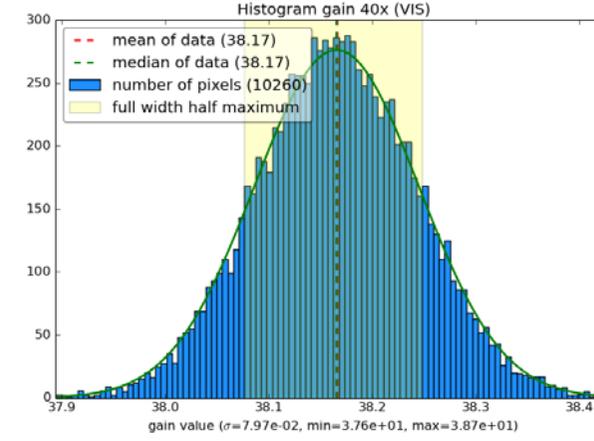
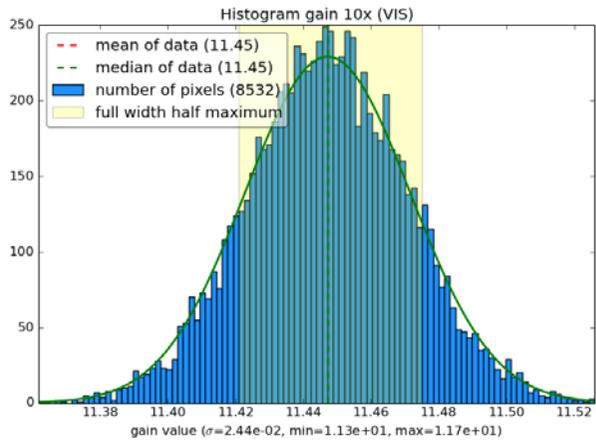
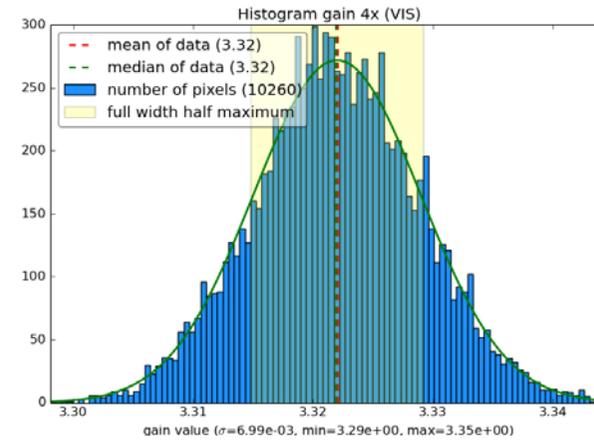
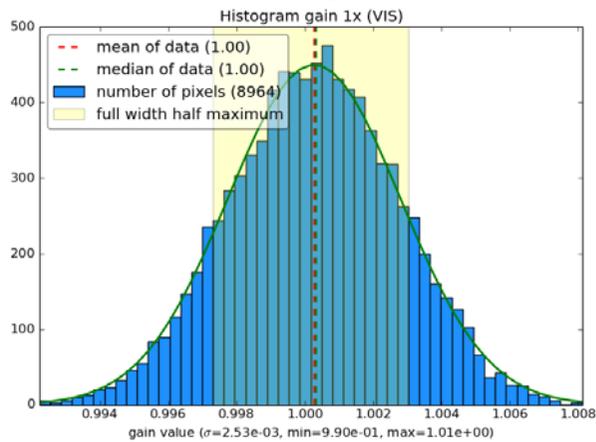
Results: histograms of 4 gain values (UV)





# Gain ratio analysis

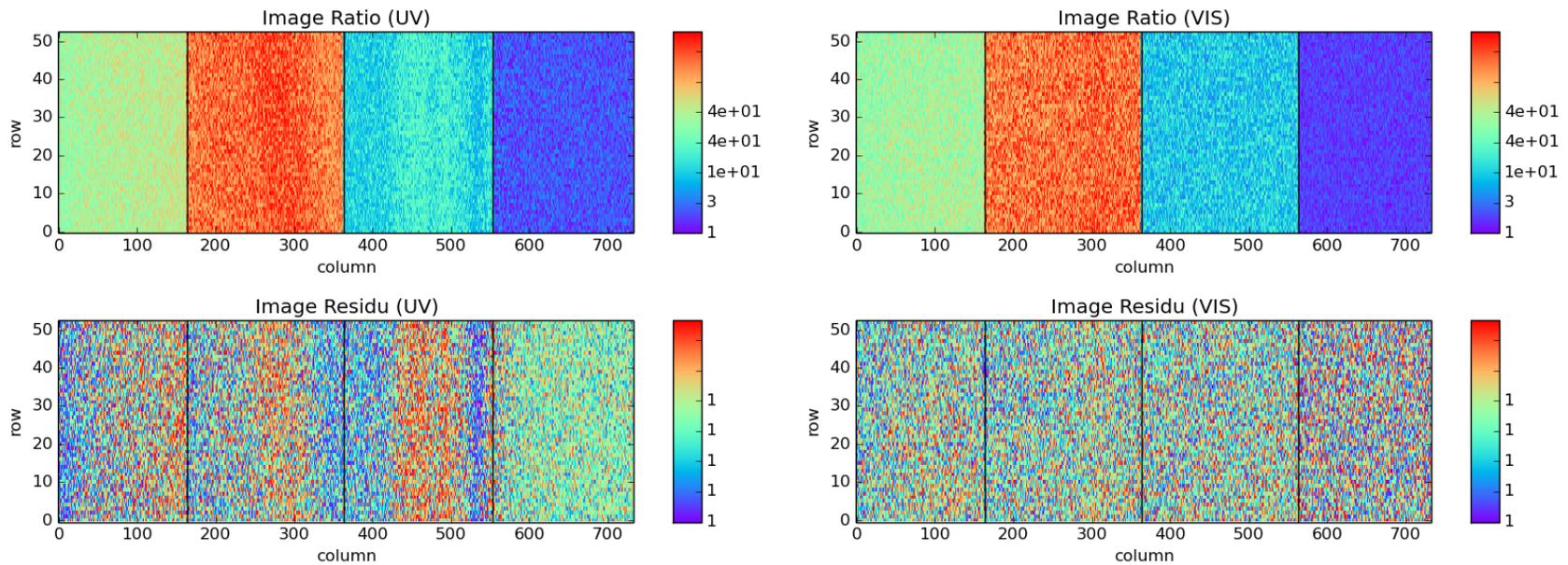
Results: histograms of 4 gain values (VIS)





# Gain ratio analysis

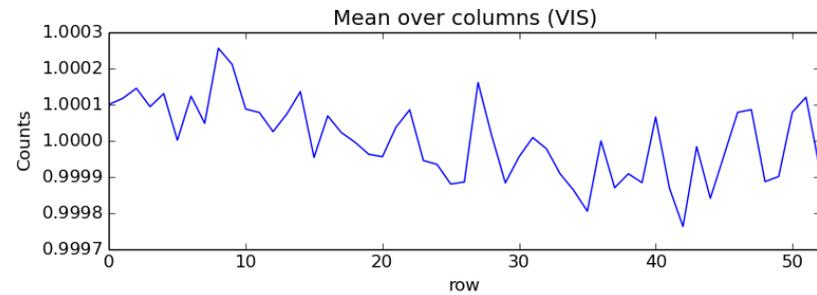
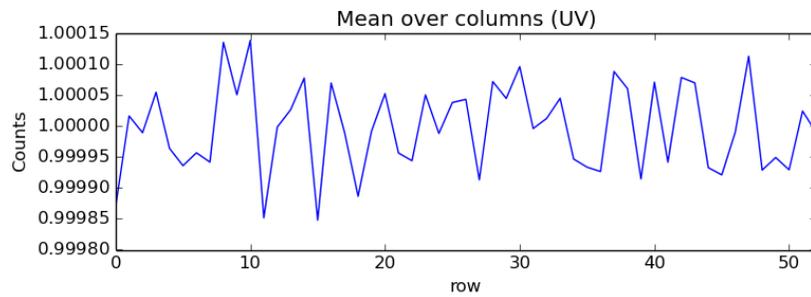
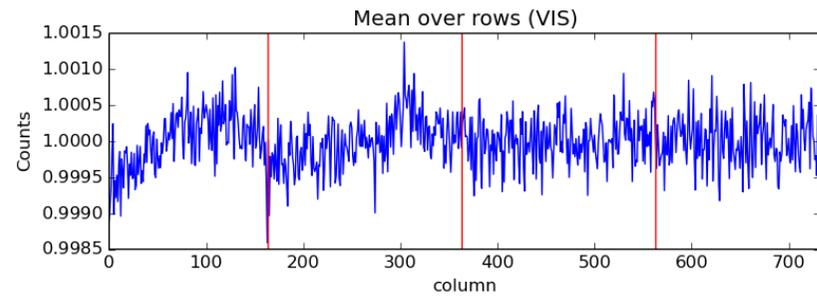
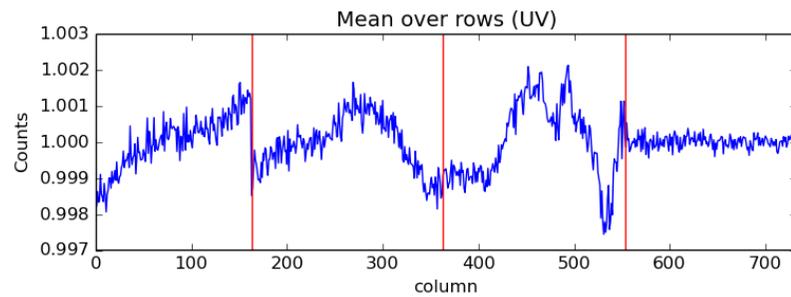
Image ratio: image with 4 gains / image with 1 gain  
Image residu: image ratio / gain values





# Gain ratio analysis

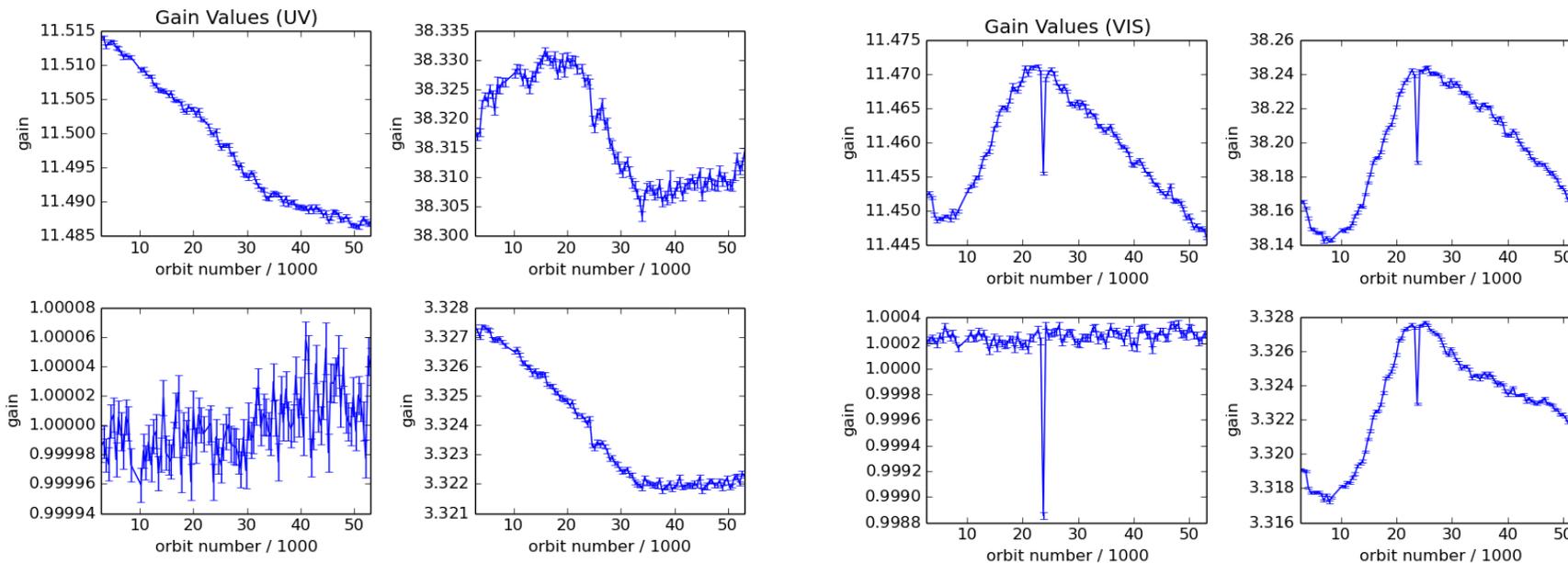
Image residu; average value over rows and columns





# Gain ratio analysis

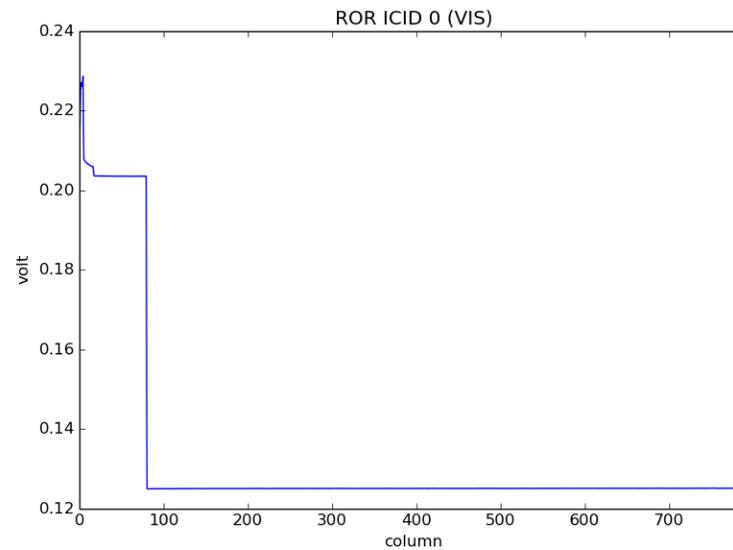
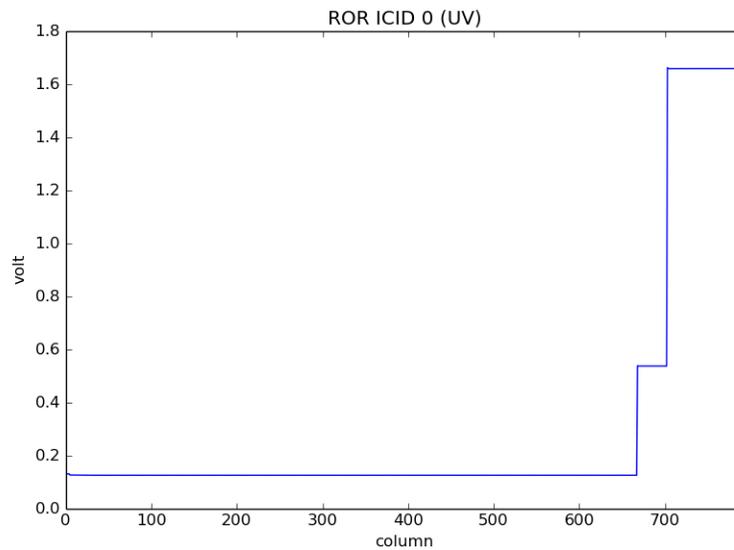
Trend analysis over OMI mission (approx. 53000 orbits)





## Electronic offset analysis

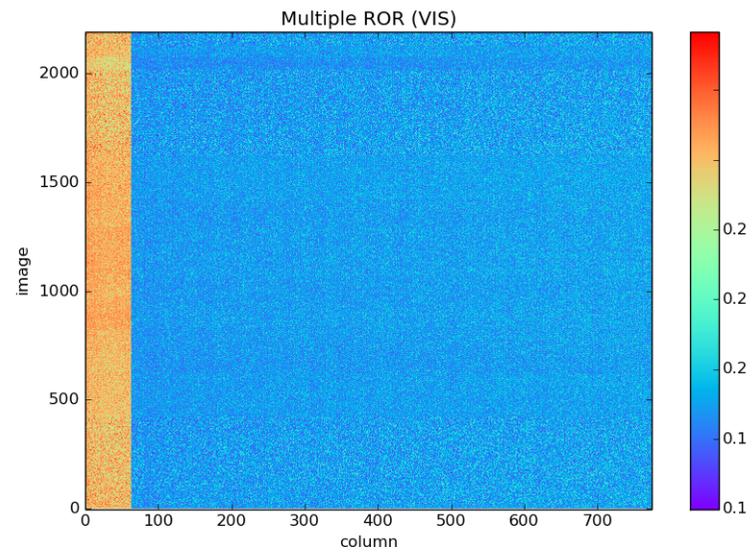
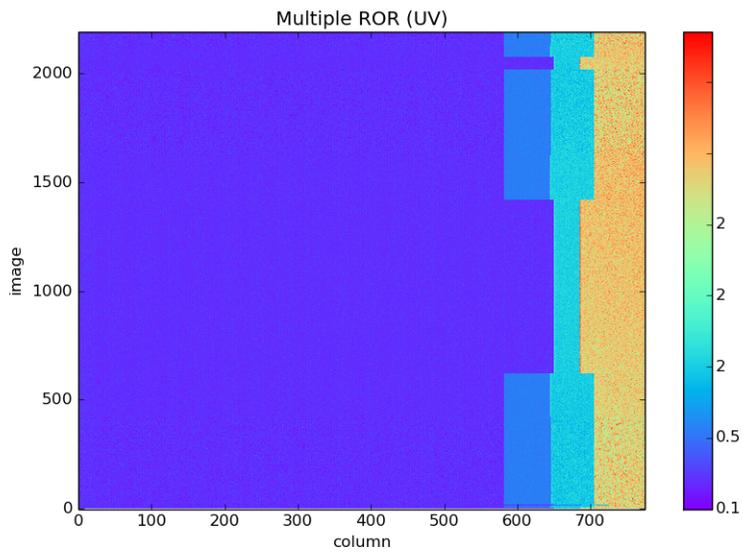
- Electronic offset values are determined from Read-Out Register (ROR)
- In first read-out of ROR there is no signal and no dark current





# Electronic offset analysis

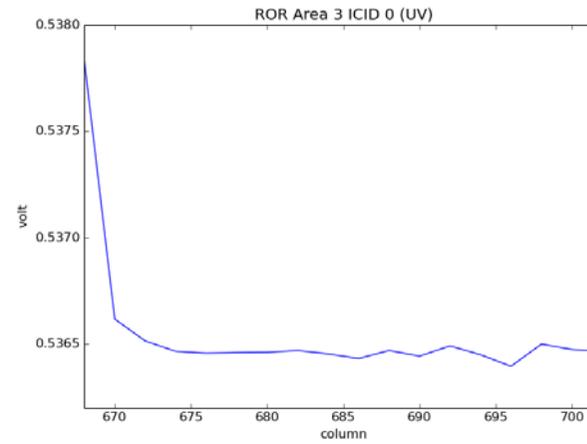
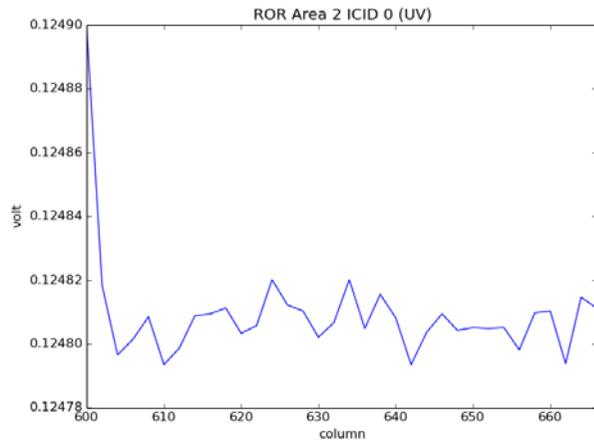
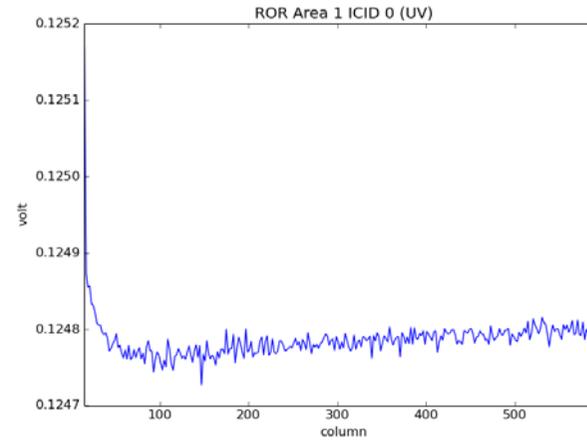
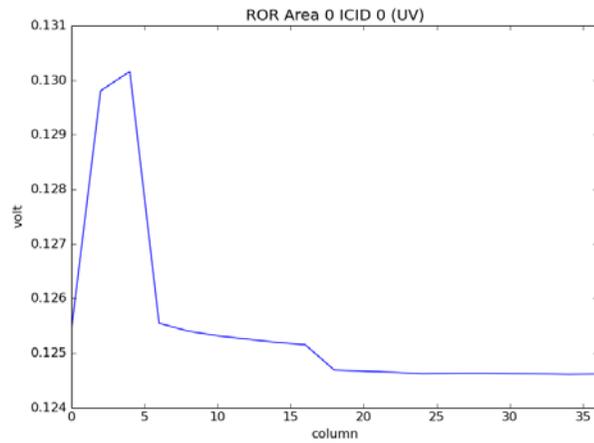
Input for analysis: RORs from one orbit  
Orbit 53225, July 18, 2014





# Electronic offset analysis

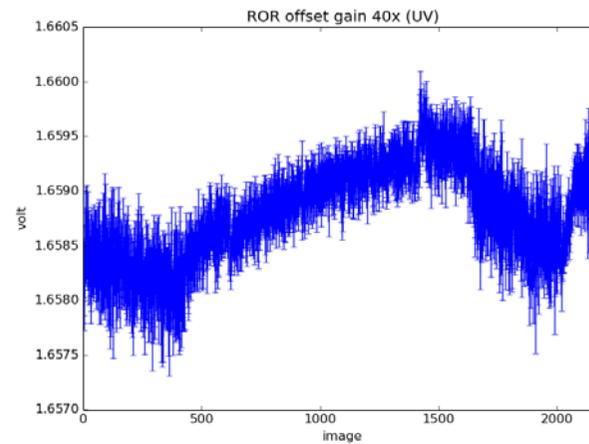
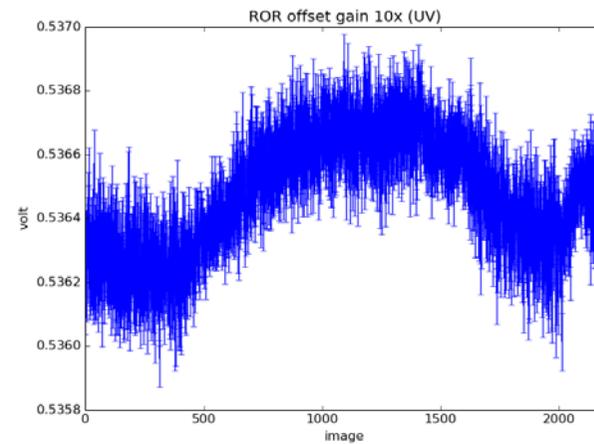
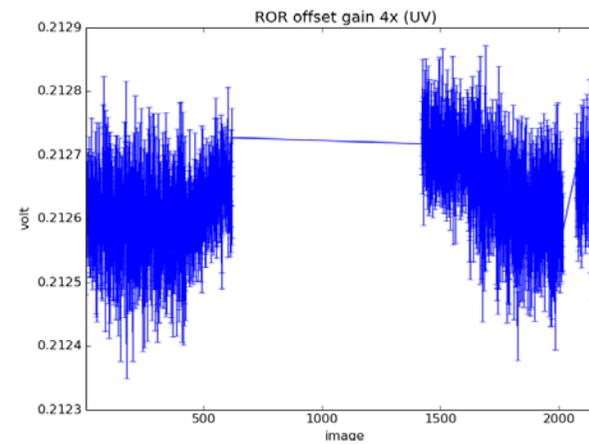
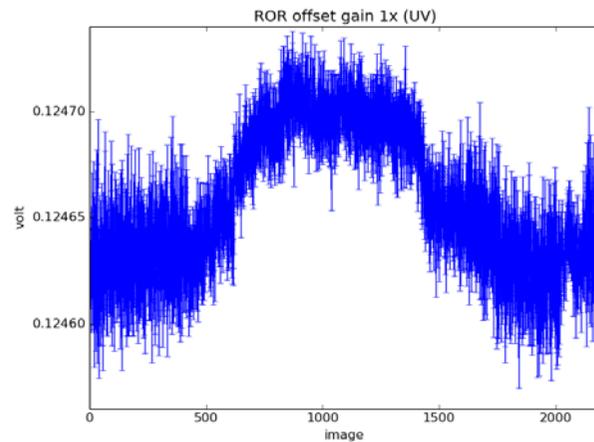
## Read-Out Register (UV channel)





# Electronic offset analysis

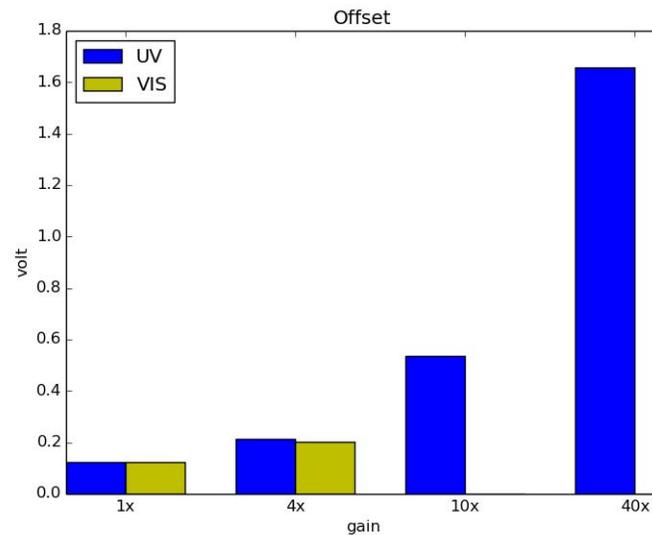
Electronic offset values over one orbit (UV channel)





# Electronic offset analysis

Resulting electronic offset values over one orbit



To do: process entire OMI mission



# OMI In-flight Calibration Data Analysis

Future work:

- › Dark current
- › Random Telegraph Signals
- › Read-out Noise
- › Detector Smear

This analysis is done to prepare for potential reprocessing of OMI Level 0 data