

# CAMERA STATE MONITORING PROCEDURE



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**PPS,**  
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- **Prosilica cameras degradation in the tunnel: Problem declaration**
- **Noise spectrum as an indicator of the camera state. Examples of camera noise spectrum**
- **Summary**

➤ Any camera degrades in radiation environment

- On-board electronics
- CCD chip

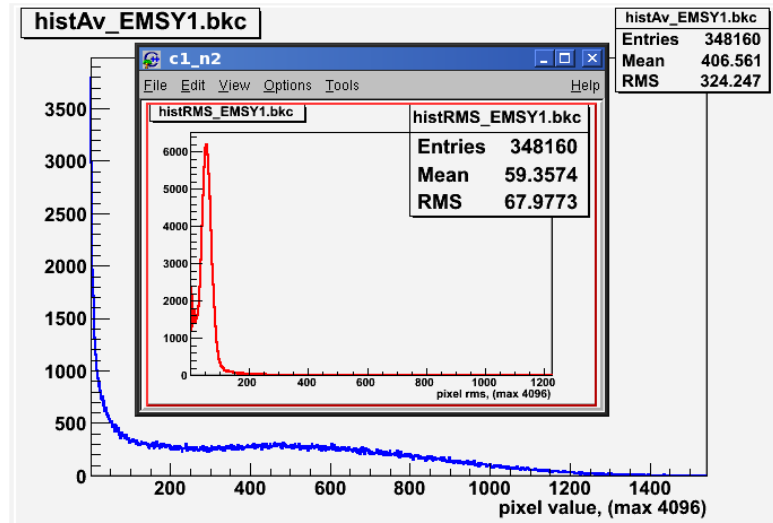
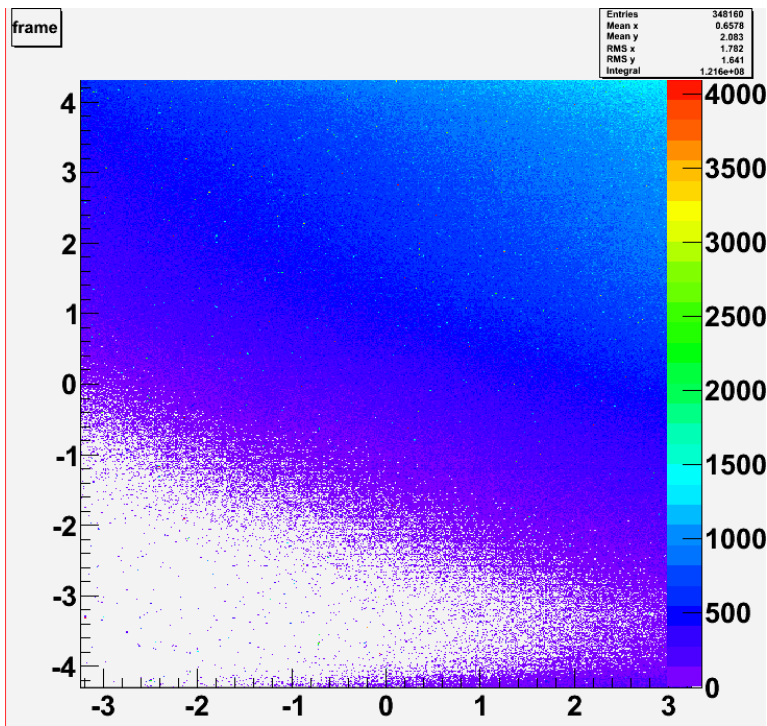
➤ Prosilicas have internal auto adjustment of parameters

- On-board realization
- The parameters are tuned continuously and the degradation can be masked beyond this algorithms

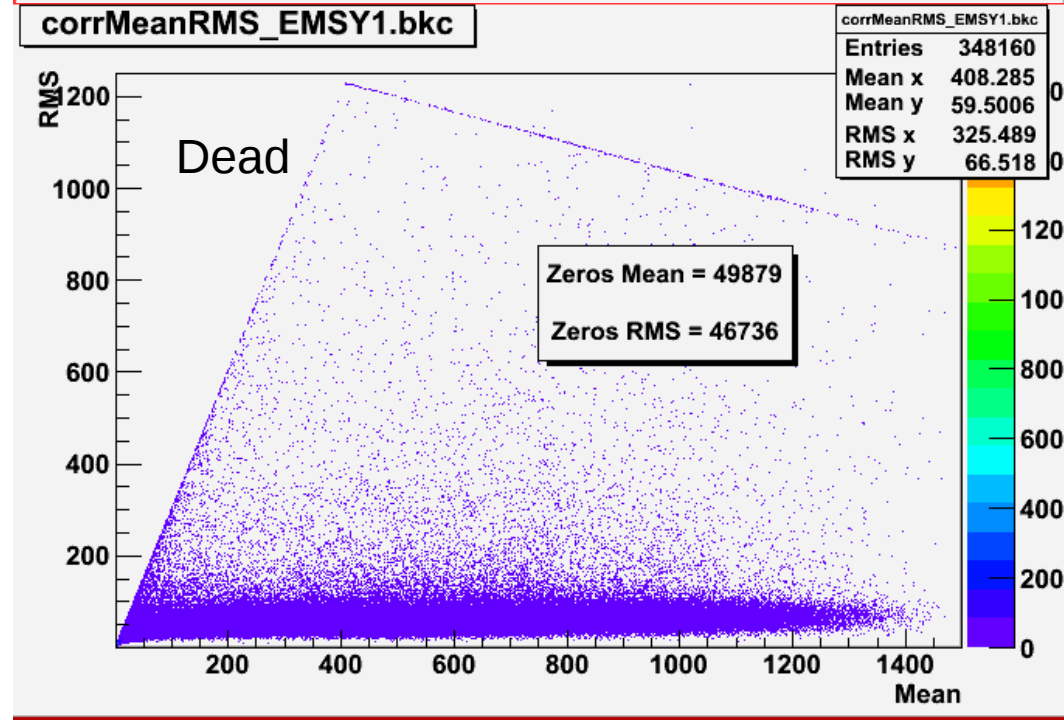
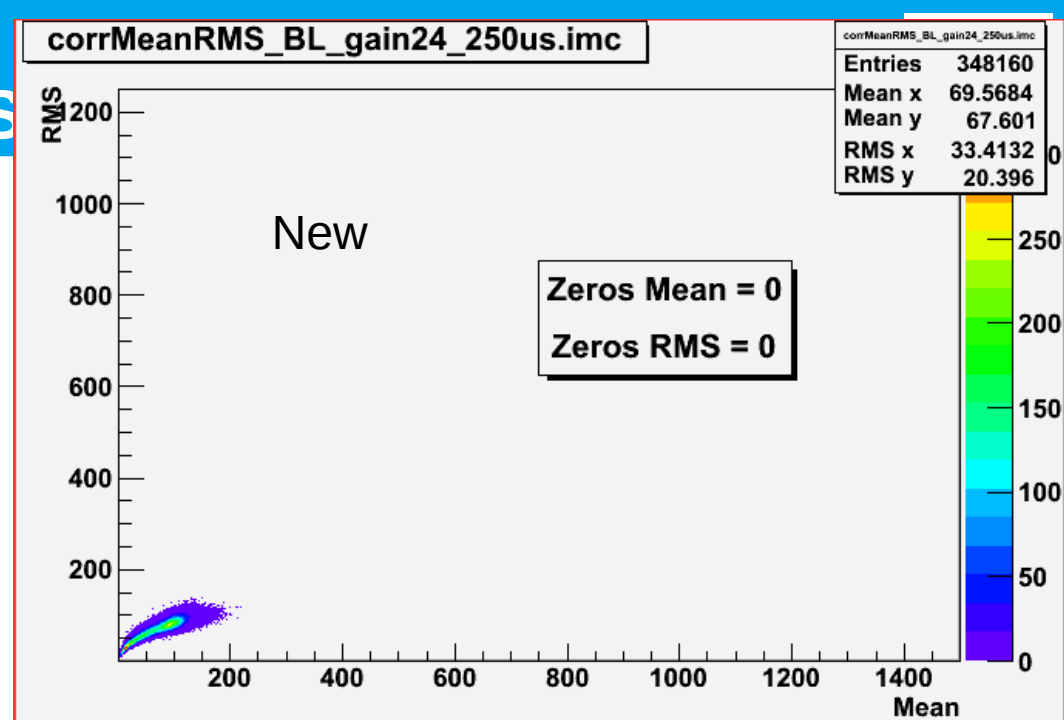
A vivid example

EMSY1, 20.03.2012

as it was used for measurements

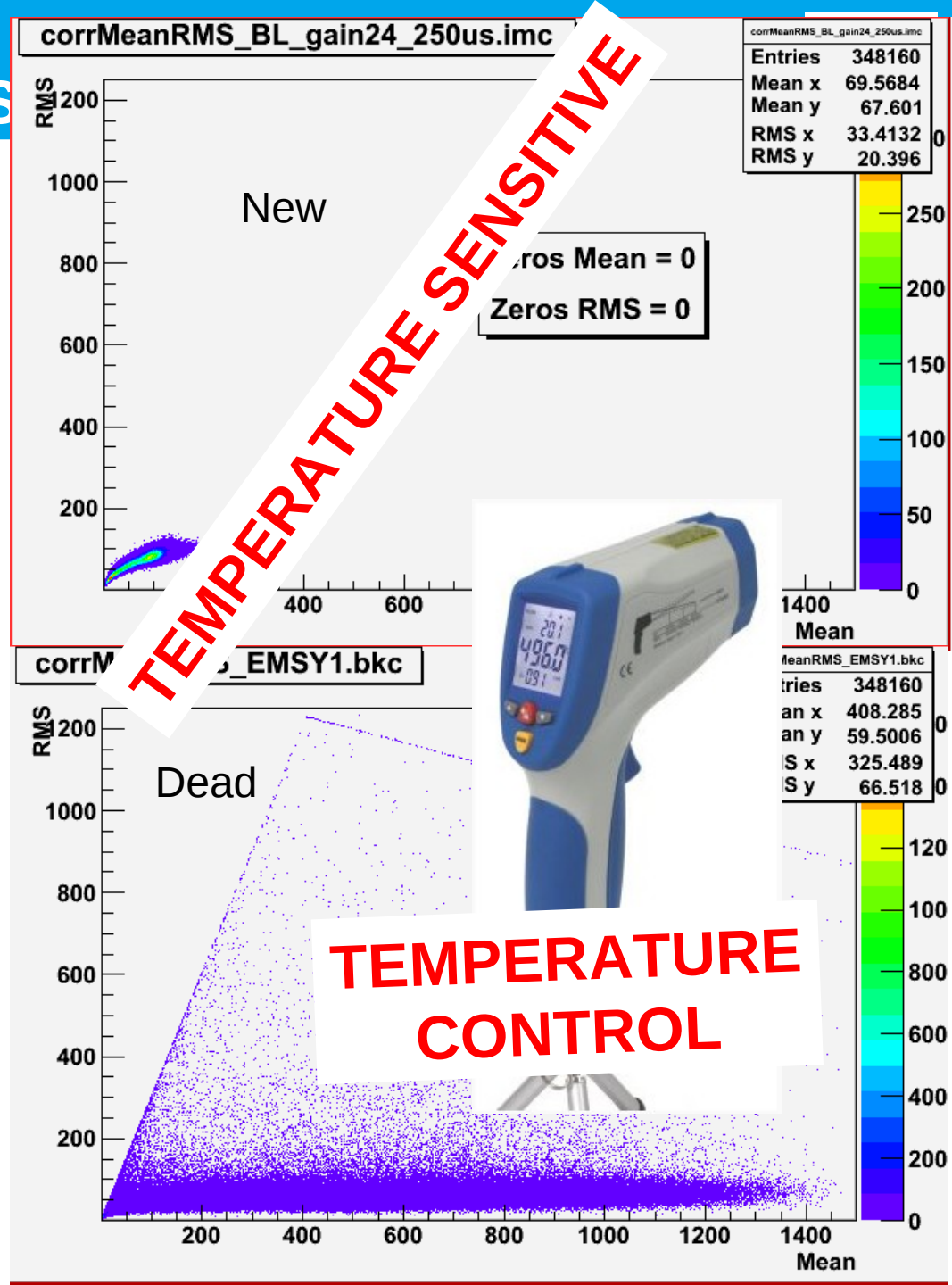


- N blind frames are taken
- A Spectrum of mean VS rms for all pixels.
- Zeros are pixels with no noise. They still are photo sensitive
- Good distribution:
  - As small as possible in both dimensions
  - No correlation
  - No zeros (mean and rms)
- Monitoring should be based upon comparing a camera spectrum to the original one (in the tunnel before irradiation)

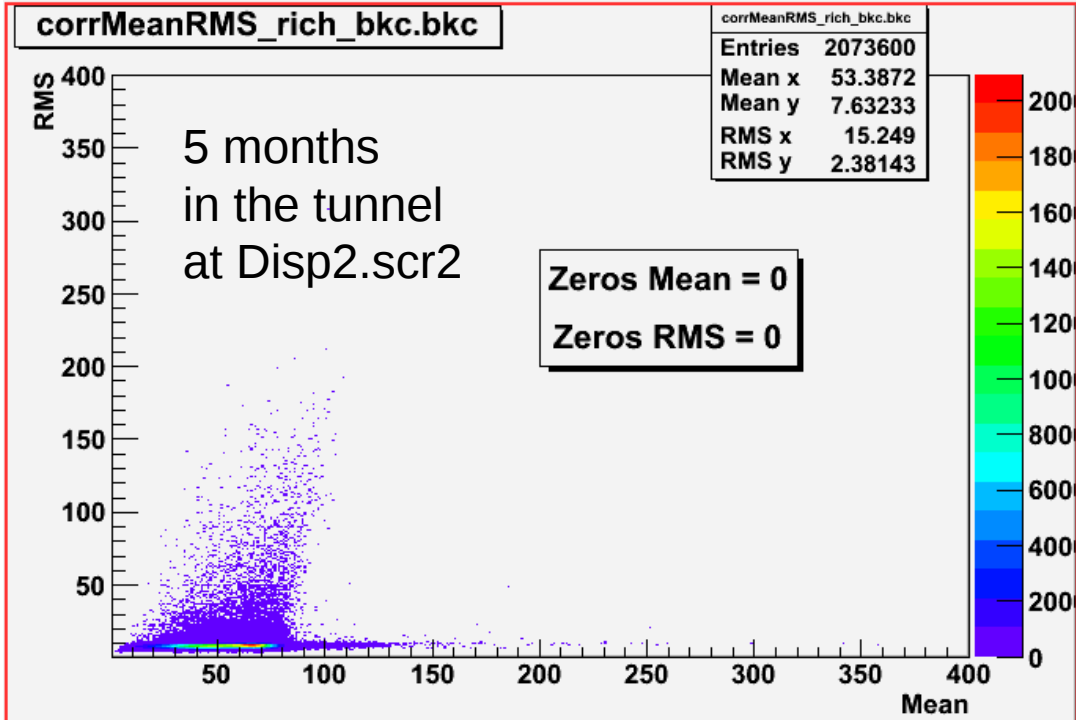
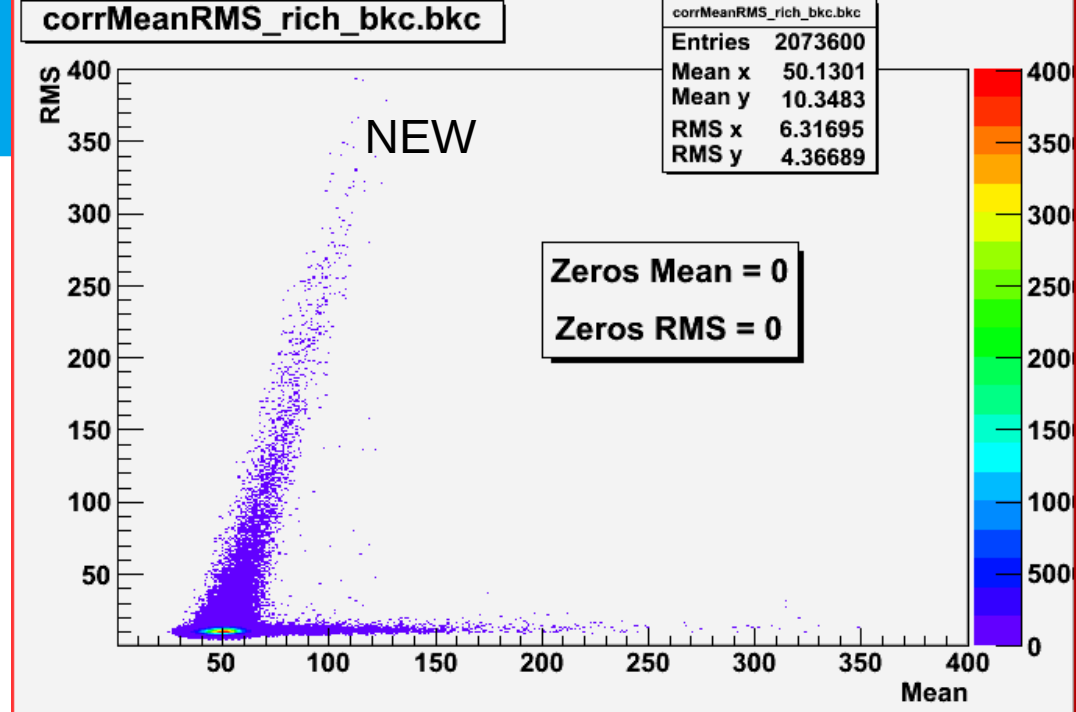


# CAMERA NOISE CHARACTERISTICS

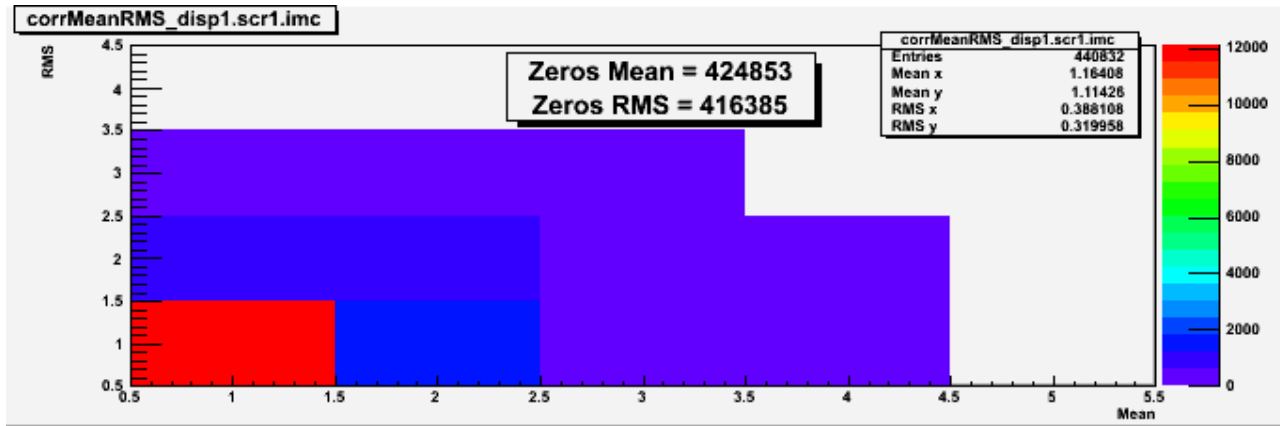
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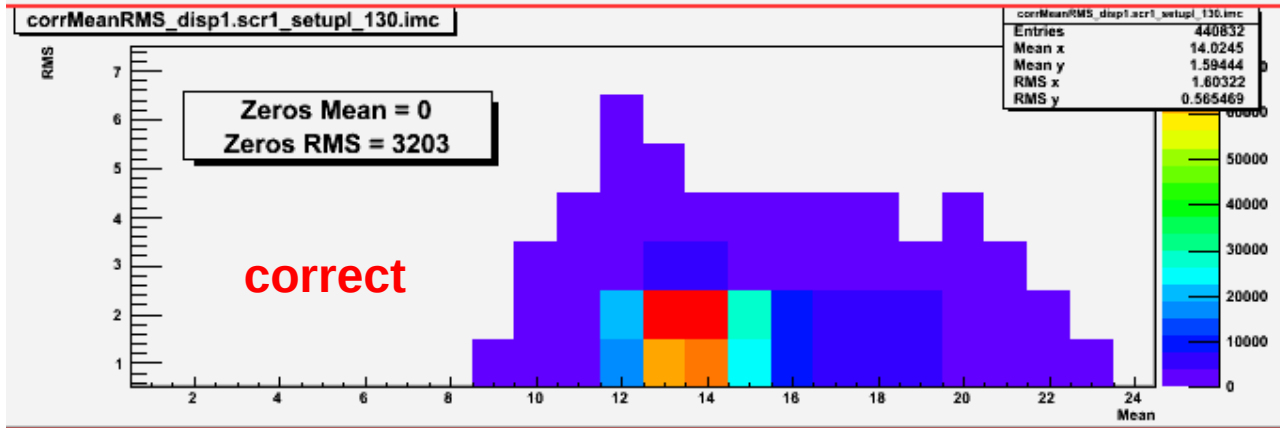
- JAI 2030
- More homogeneous than prosilicas from the start
- Does not allow high gains
- Gain ?/0
- Zeros can be corrected by setup level

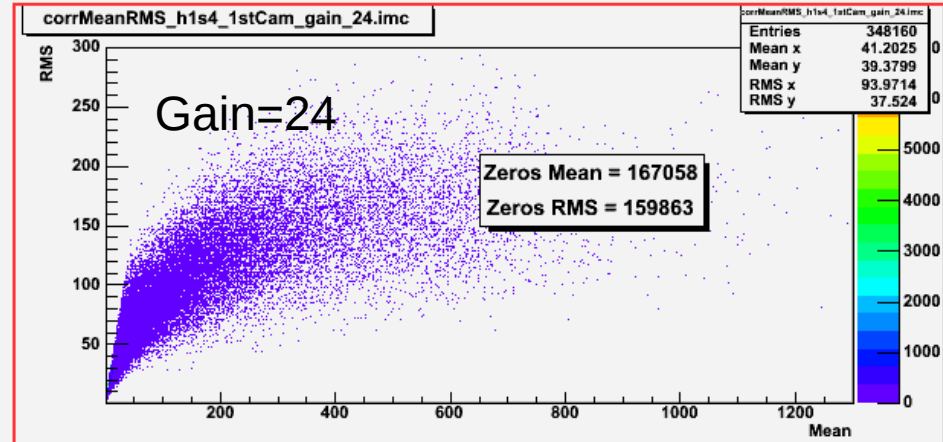
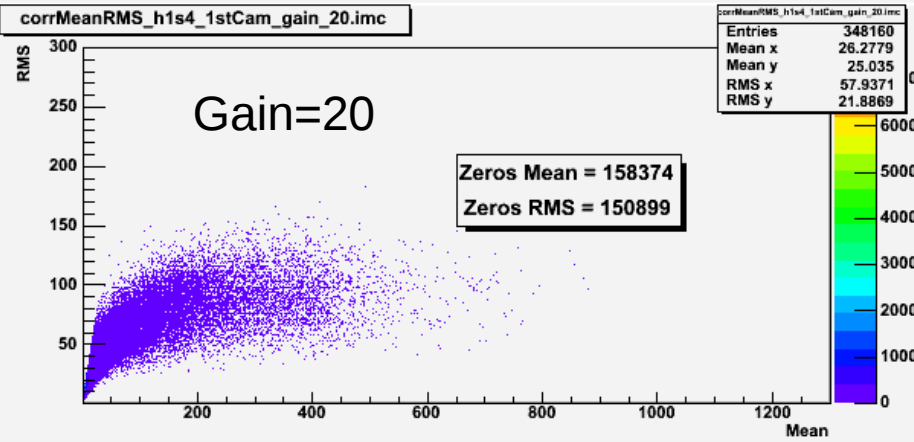
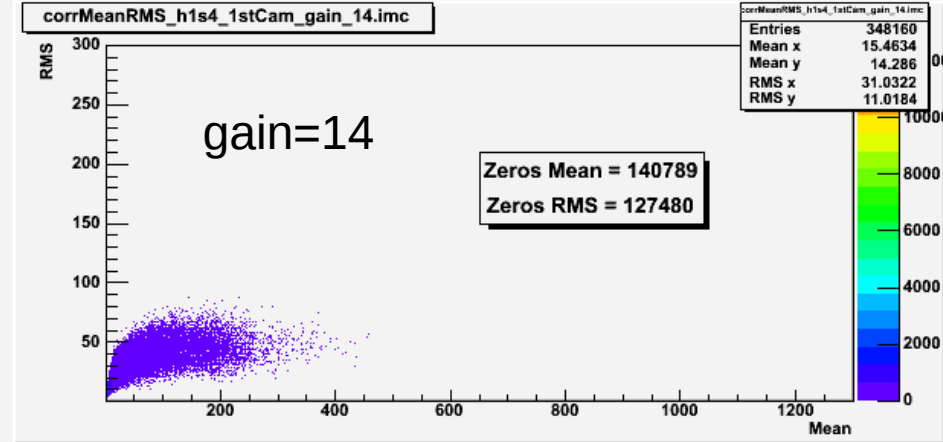
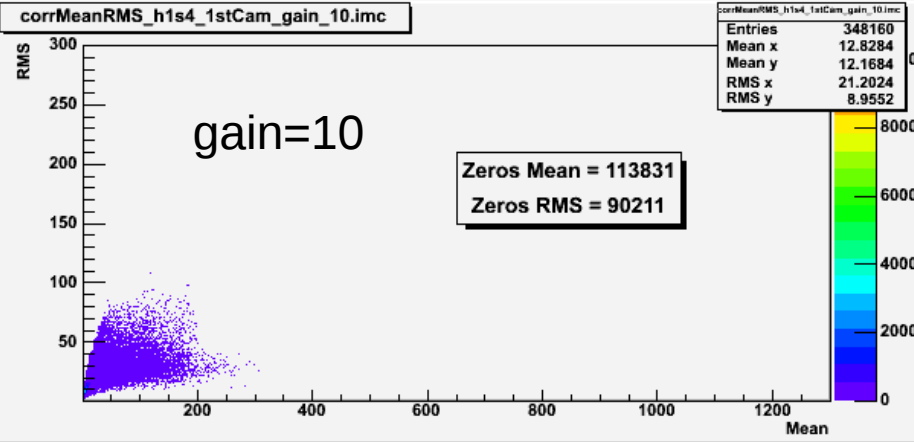


➤ SL=100



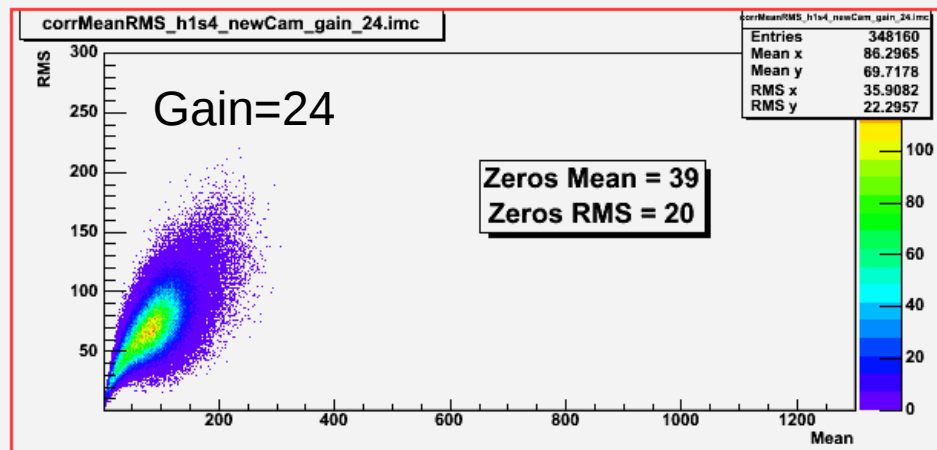
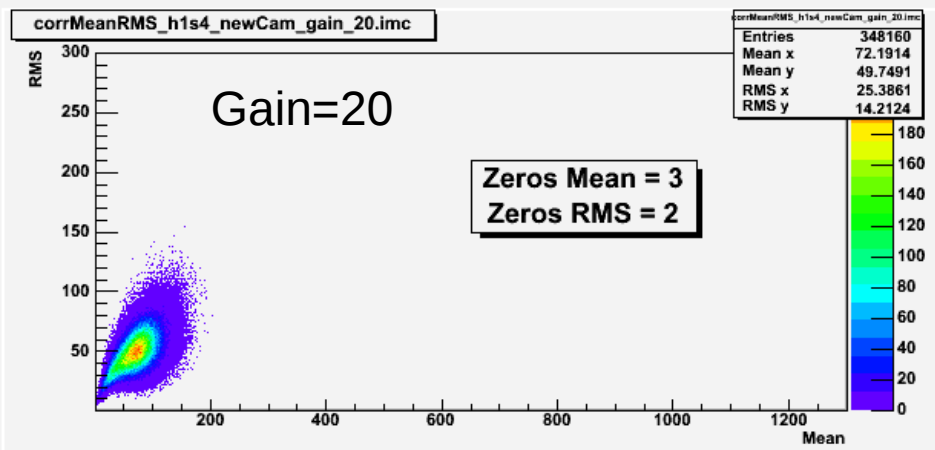
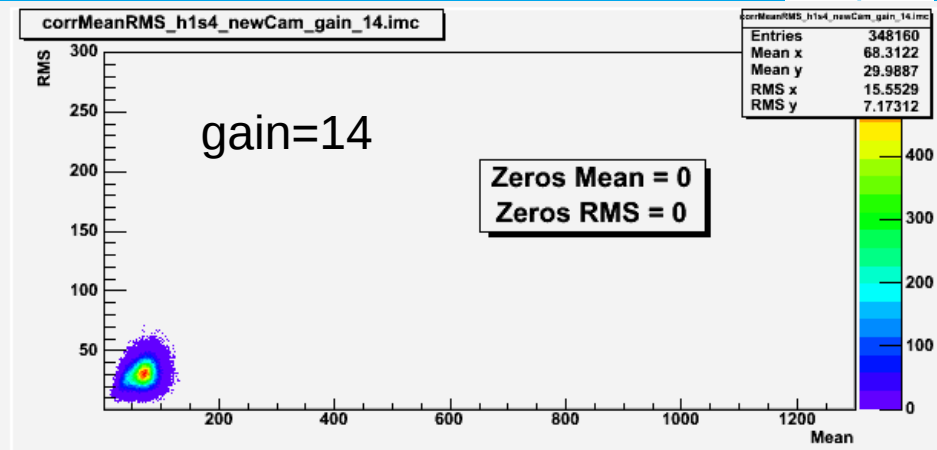
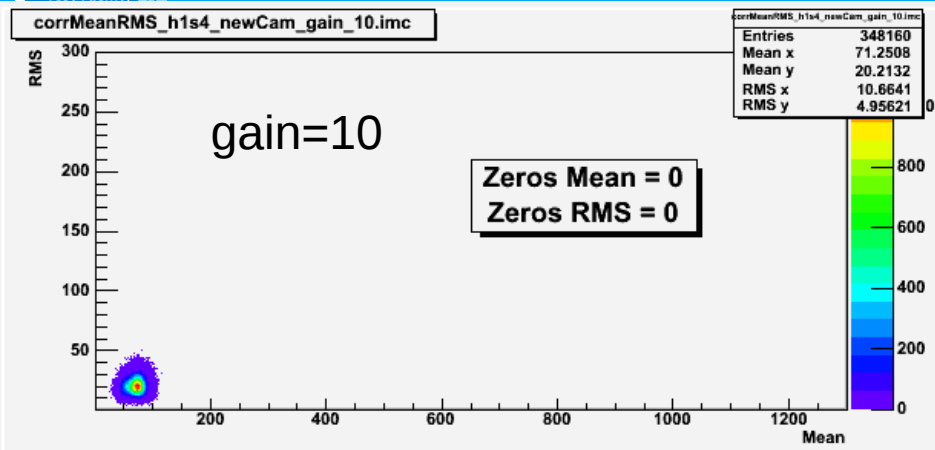
➤ SL=130





**Due to a faulty black level  
was replaced with ...**





- Simple monitoring process can be based upon noise spectrum measurement
  - Criteria still to be worked out
- Reference measurements for each newly installed camera at its position in the tunnel are **REQUIRED**. (People, responsible for installation)
  - (30 frames, different gain values with step of 2)
- A responsible person is needed for monitoring the cameras on a weekly basis.