

# Low Energy Efficiency

GEM1 V Scan Analysis

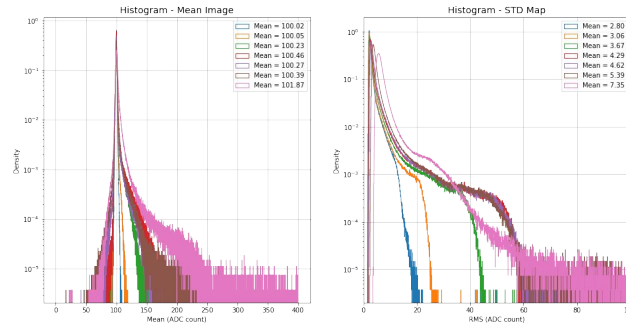
**Bernardo Deps Almeida**

# Pedestal Analysis

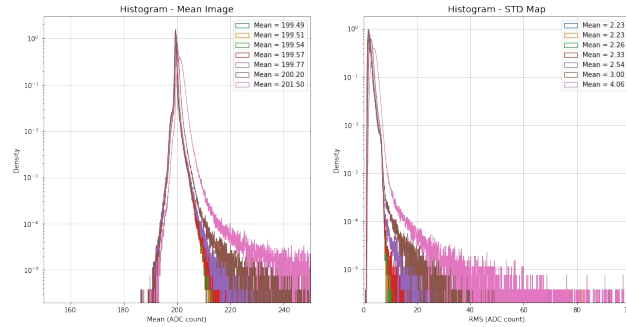
# Summary

- Pedestal analysis for Orca Fusion BT, Orca Quest and Thorit
  - Orca Fusion BT: Pedestals [6291, 6297]
  - Orca Quest: Pedestals [6314, 6320]
  - Thorit: Pedestals [6340, 6346]
- Noise Analysis
  - Comparing the Mean and Standard Deviation Maps
  - Visualisation of The Mean and Standard Deviation Evolution over Exposure Time
  - Quadrants Analysis: Diagonal and Cross
  - Quadrants Analysis over Exposure Time
  - Energy Resolution
  - Read Noise [keV]
- Conclusion
- Next Steps

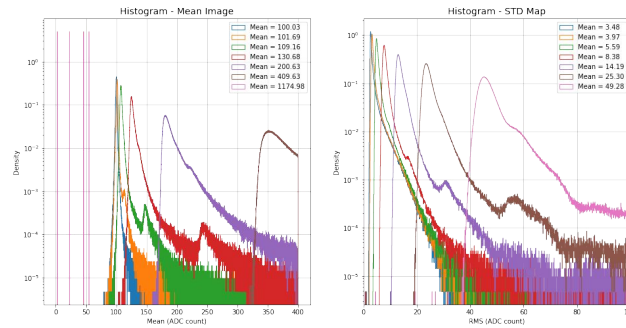
# Orca Fusion BT



Stochastic Image Analysis - Orca Quest 15550



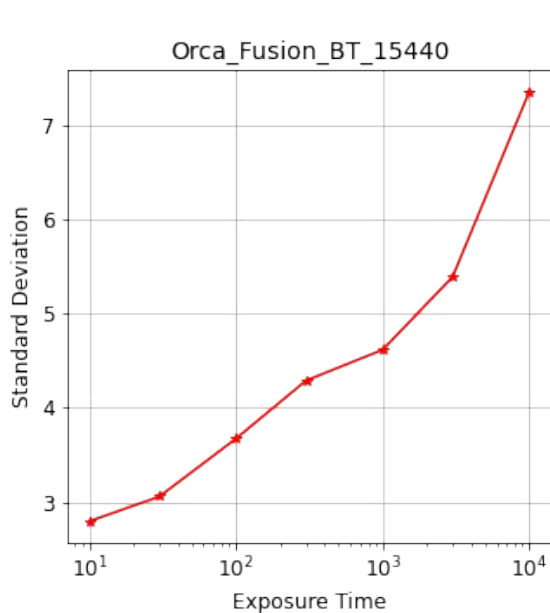
Stochastic Image Analysis - Thorit 11440



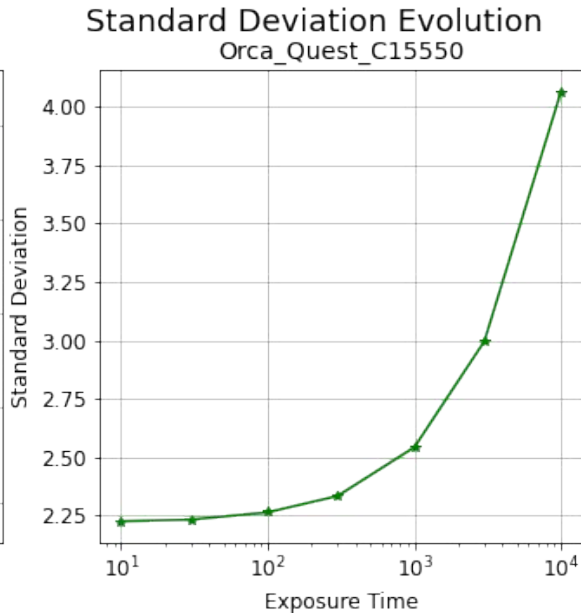
# Orca Quest

# Thorit

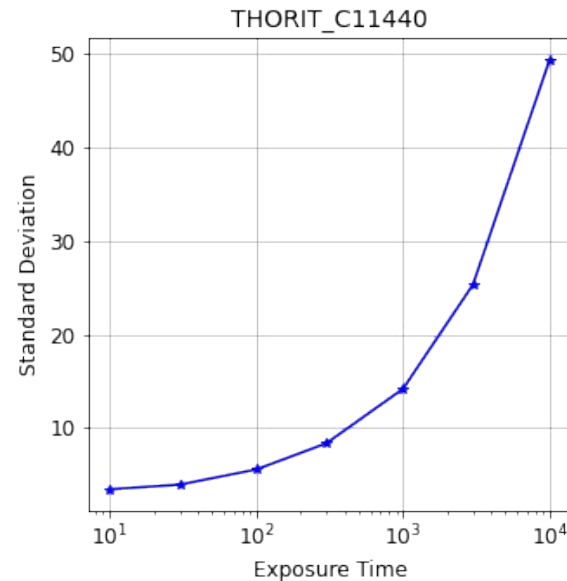
# Standard Deviation Evolution over Exposure Time



Min 2.80 | Max 7.35



Min 2.36 | Max 4.09



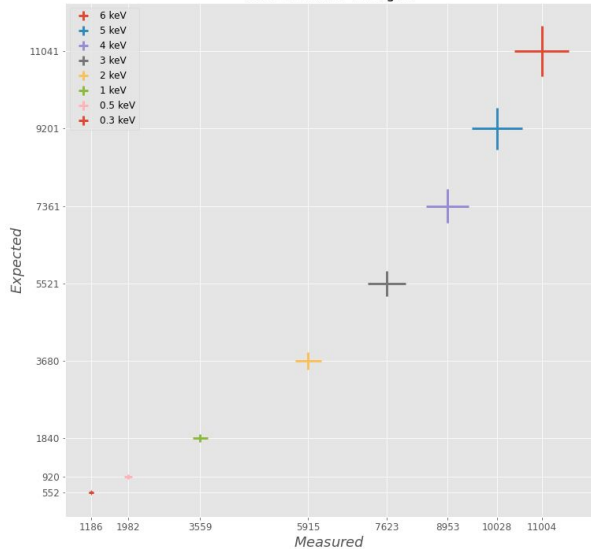
Min 3.48 | Max 49.28

# Energy Simulation Analysis

# Summary

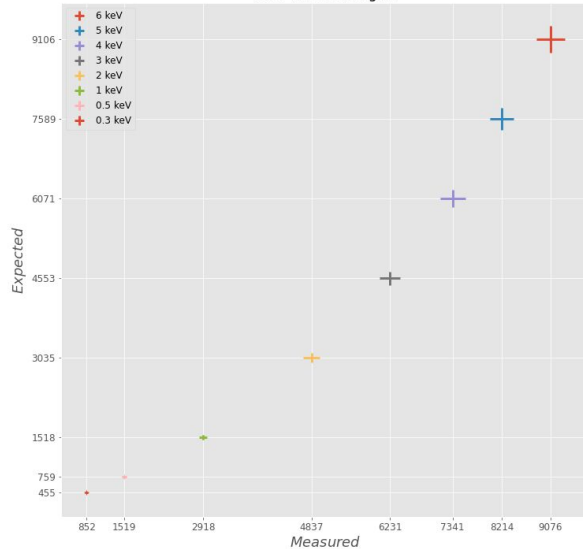
- Energies Simulation with GEM1\_V
  - Orca Fusion - runs 6306 to 6313
  - Orca Quest - runs 6332 to 6339
  - Thorit - runs 6355 to 6362\*
  
- Conclusion
  
- Next Steps

Orca Fusion BT Energies



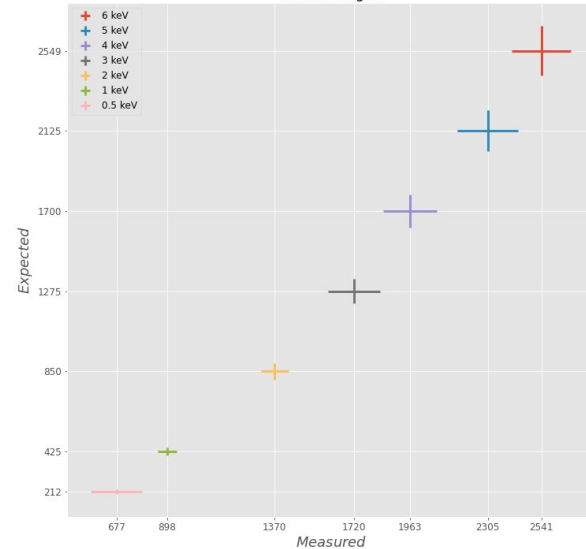
Orca Fusion

Orca Quest Energies



Orca Quest

Thorit Energies



Thorit



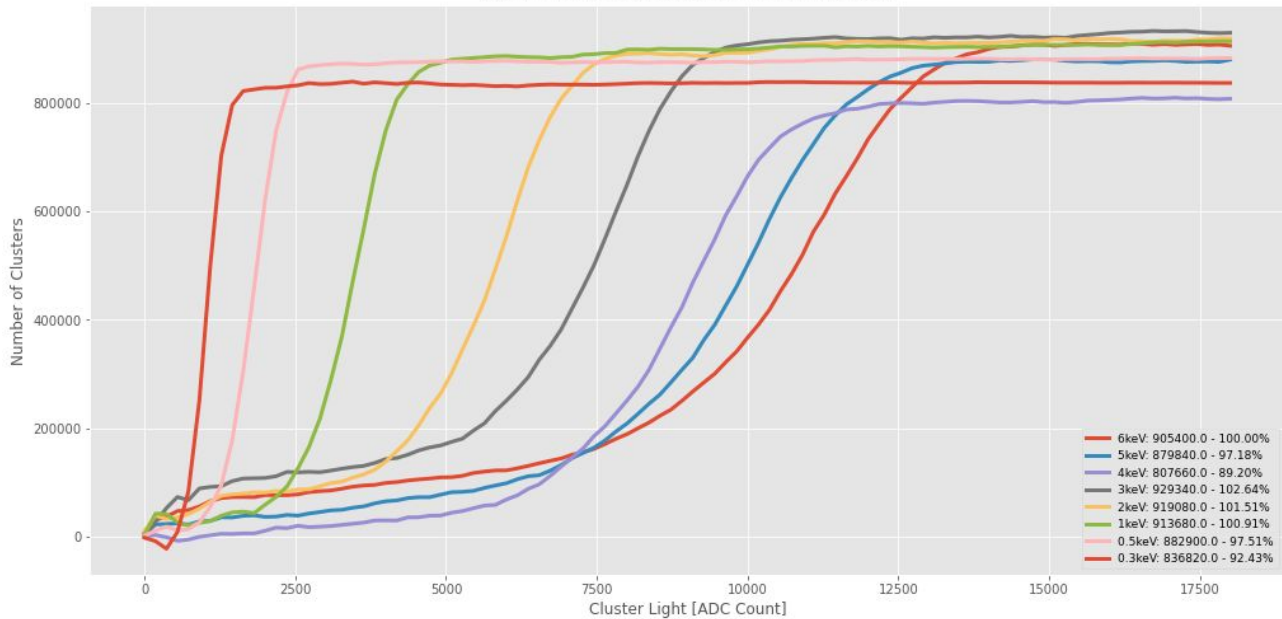
# Low Energy Efficiency

GEM1 V Scan Analysis

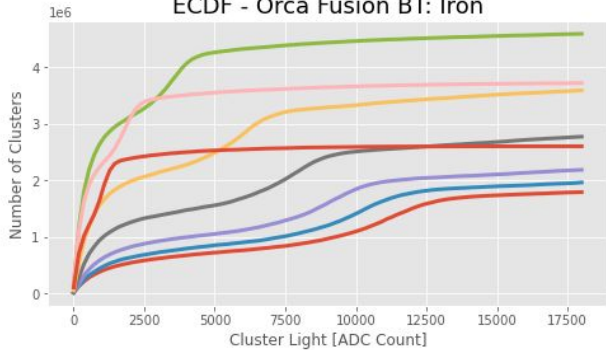
# Goals

- To understand if the sensor keeps the efficiency at low energies
- Understand if the cosmics dataset is floating and disturbing the subtraction or if the iron is degrading although the GEM1  $\nabla$  energy simulation.

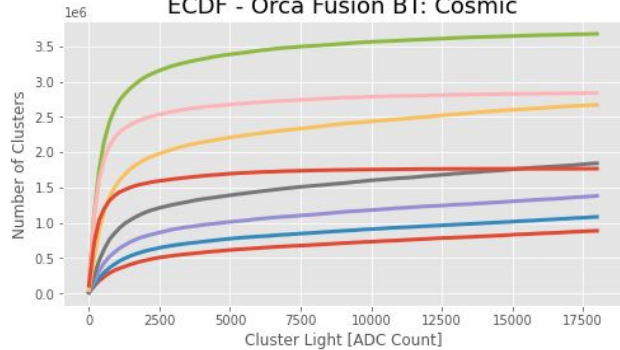
ECDF - Orca Fusion BT: Iron - Cosmic



ECDF - Orca Fusion BT: Iron

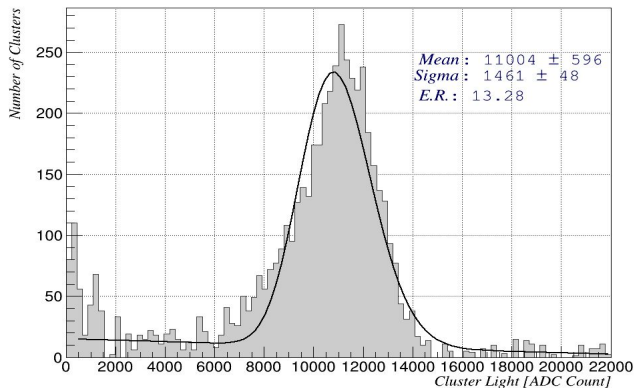


ECDF - Orca Fusion BT: Cosmic

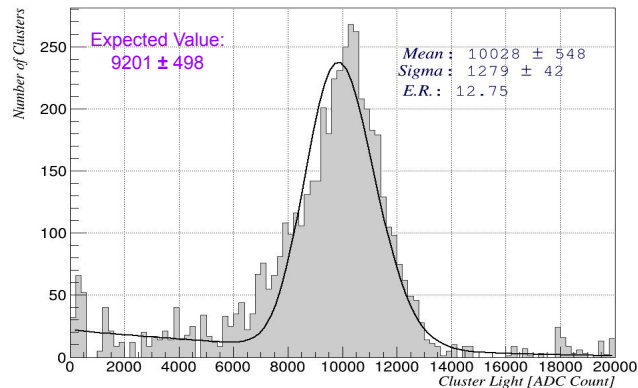


# Orca Fusion (from 6 to 3 keV)

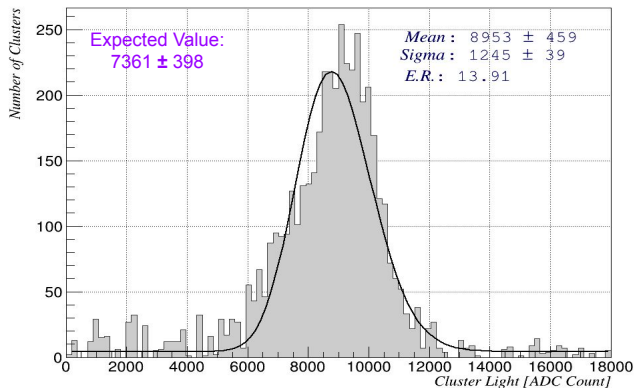
Orca Fusion BT - Diference: 6306 - 6298: 6 keV



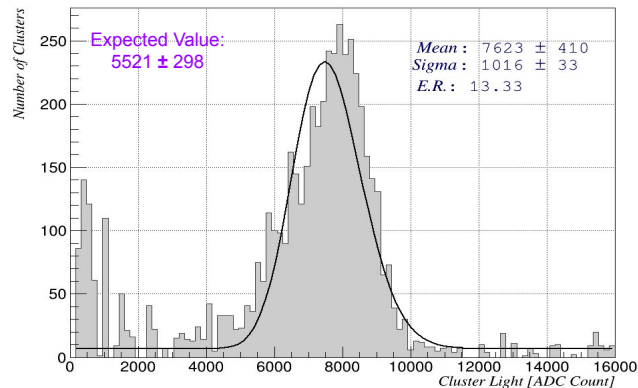
Orca Fusion BT - Diference: 6307 - 6299: 5 keV

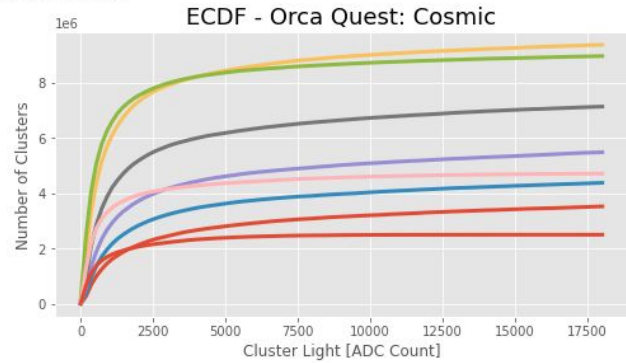
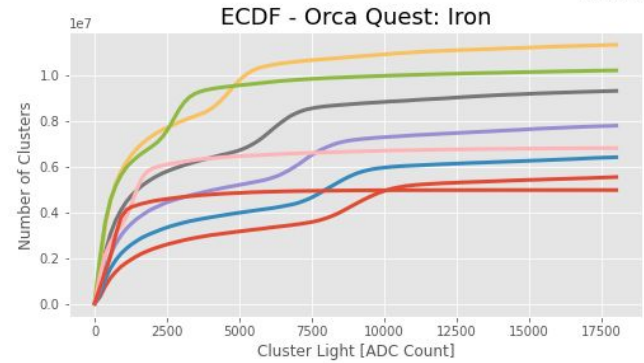
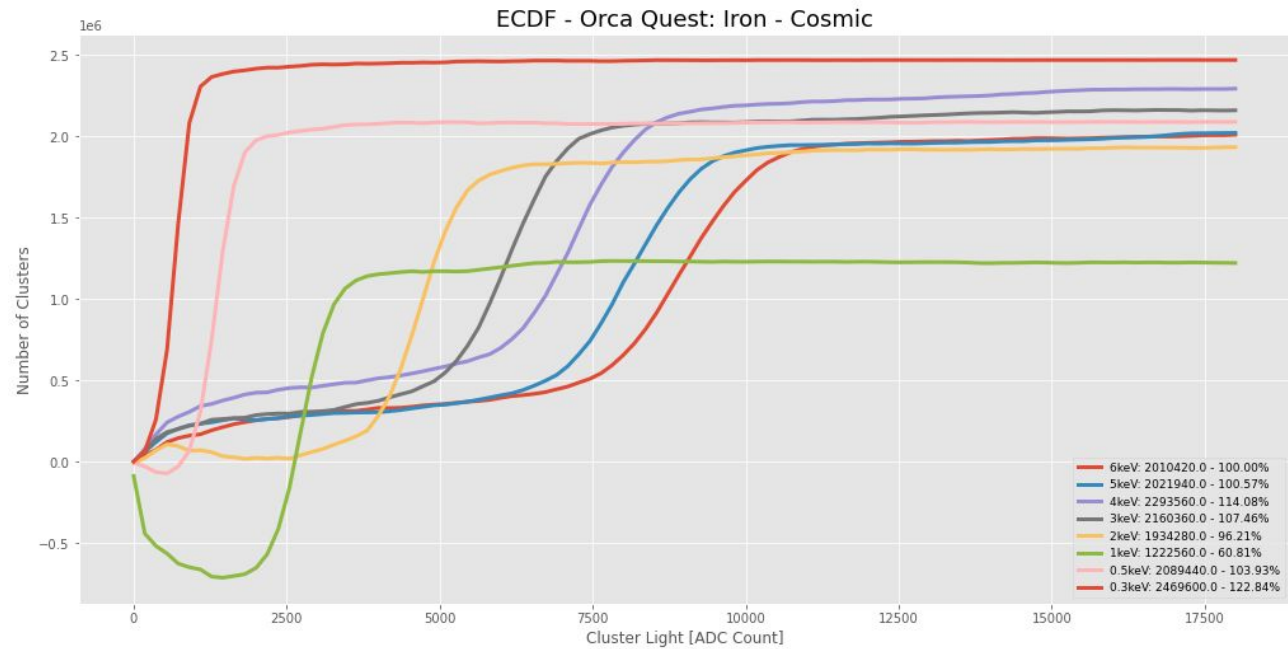


Orca Fusion BT - Diference: 6308 - 6300: 4 keV



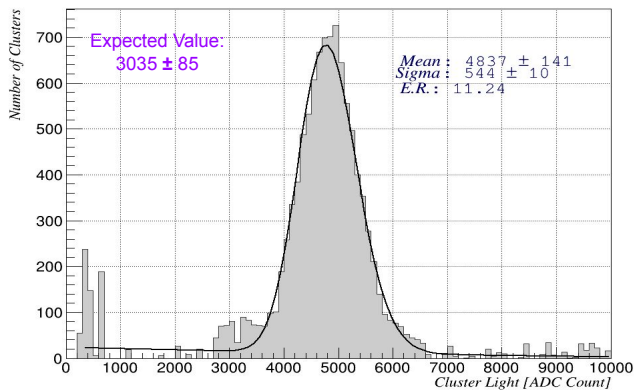
Orca Fusion BT - Diference: 6309 - 6301: 3 keV



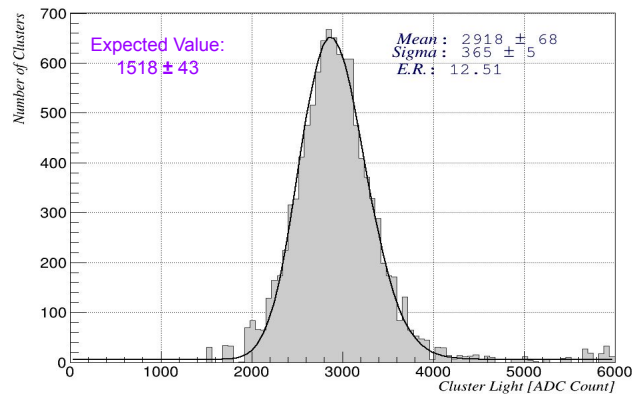


# Orca Quest (from 2 to 0.3 keV)

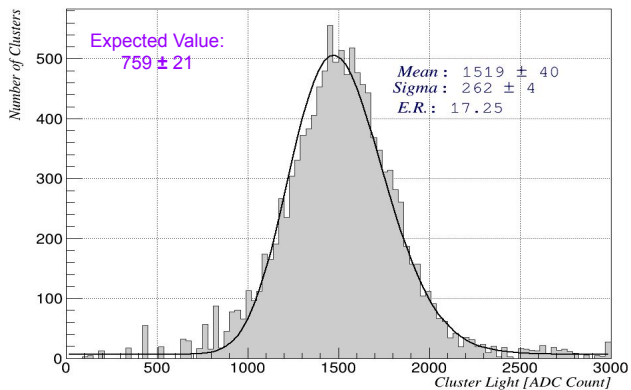
Orca Quest - Difference: 6336 - 6328: 2 keV



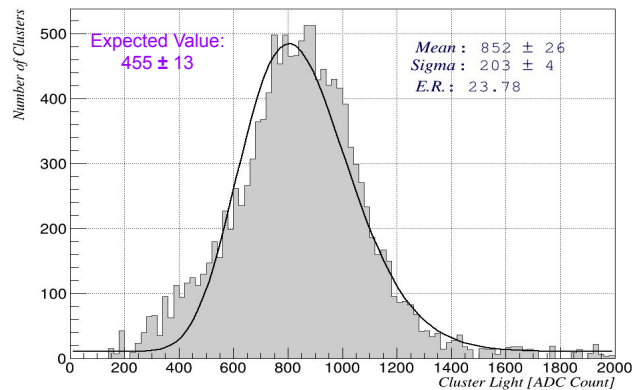
Orca Quest - Difference: 6337 - 6329: 1 keV



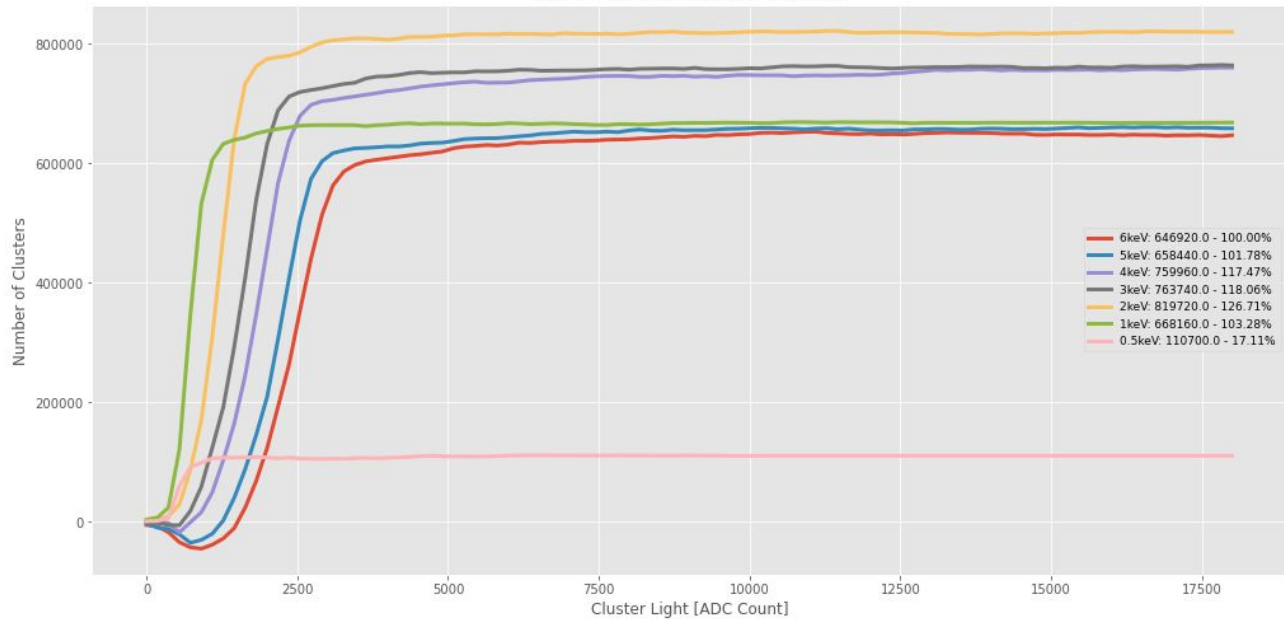
Orca Quest - Difference: 6338 - 6330: 0.5 keV



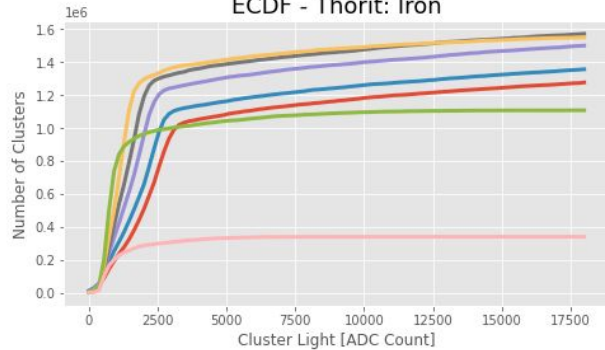
Orca Quest - Difference: 6339 - 6331: 0.3 keV



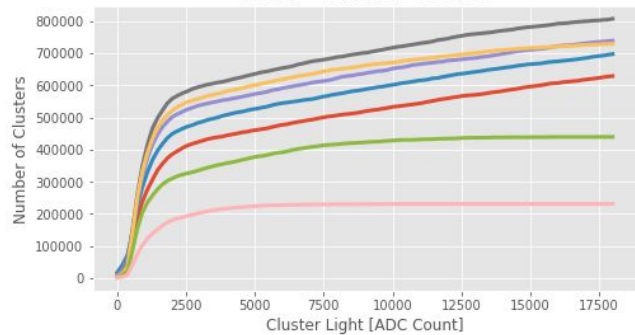
ECDF - Thorit: Iron - Cosmic



ECDF - Thorit: Iron

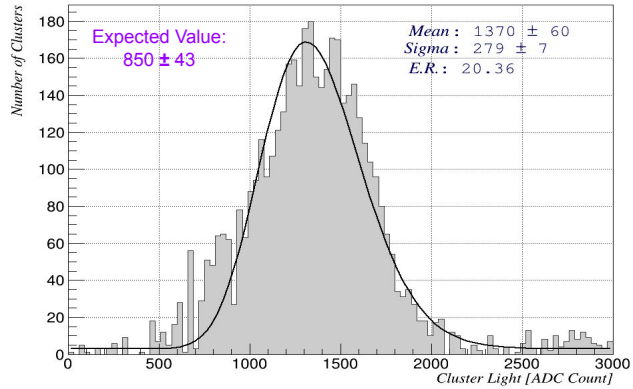


ECDF - Thorit: Cosmic

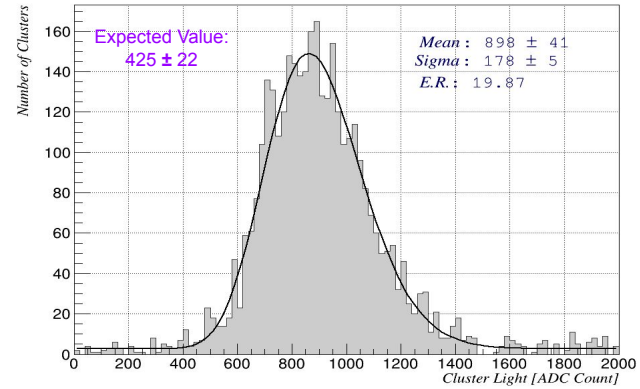


# Thorit (from 2 to 0.3 keV)

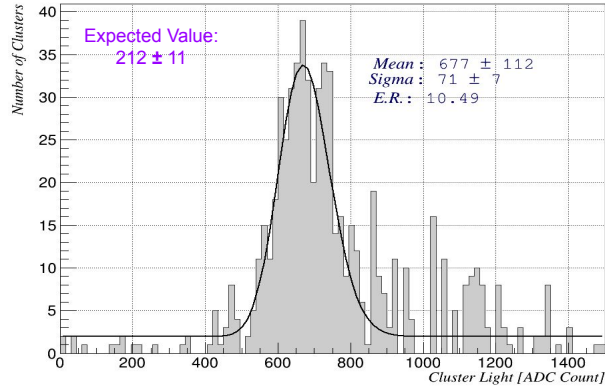
Thorit - Diferrence: 6359 - 6351: 2 keV



Thorit - Diferrence: 6360 - 6352: 1 keV

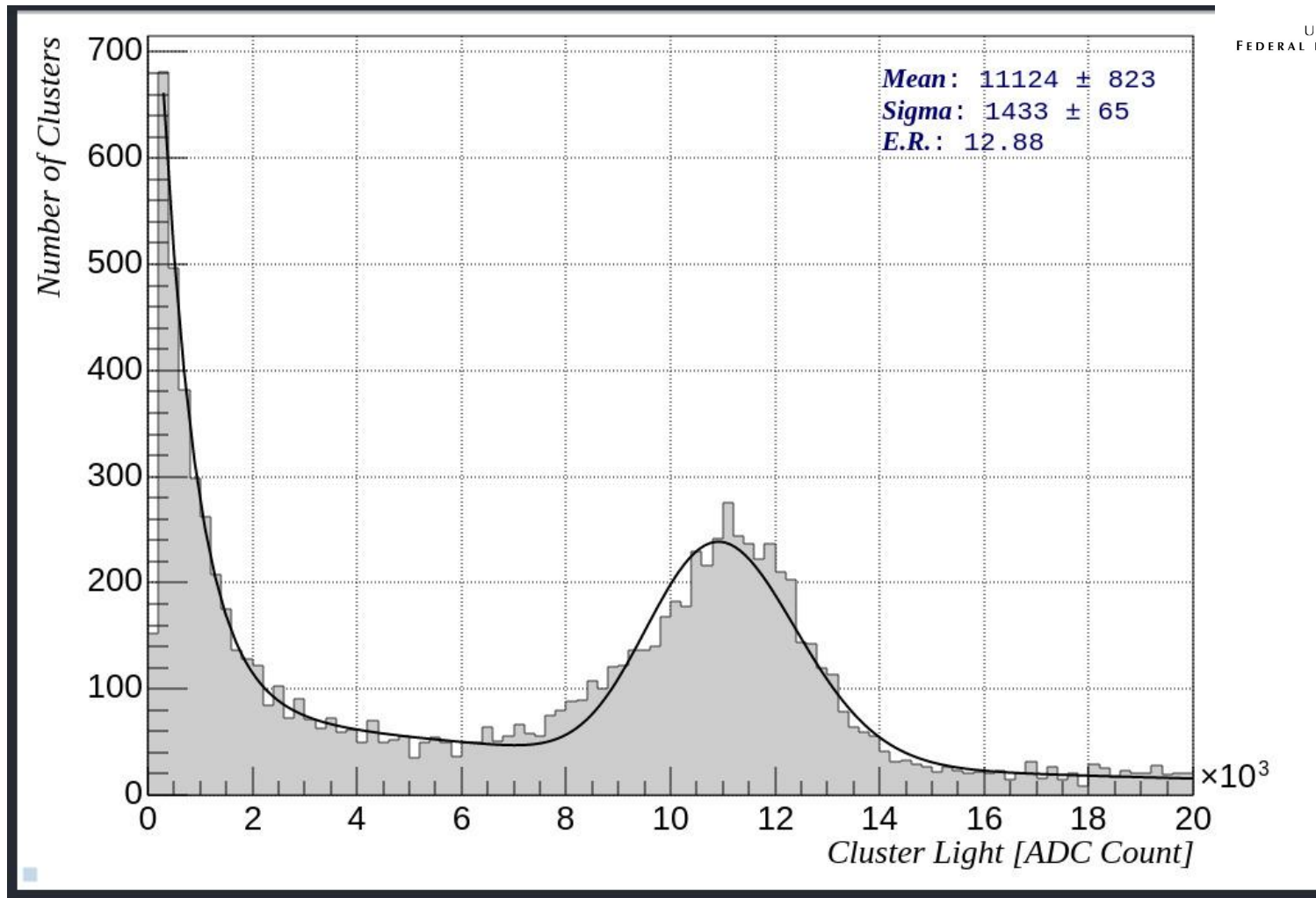


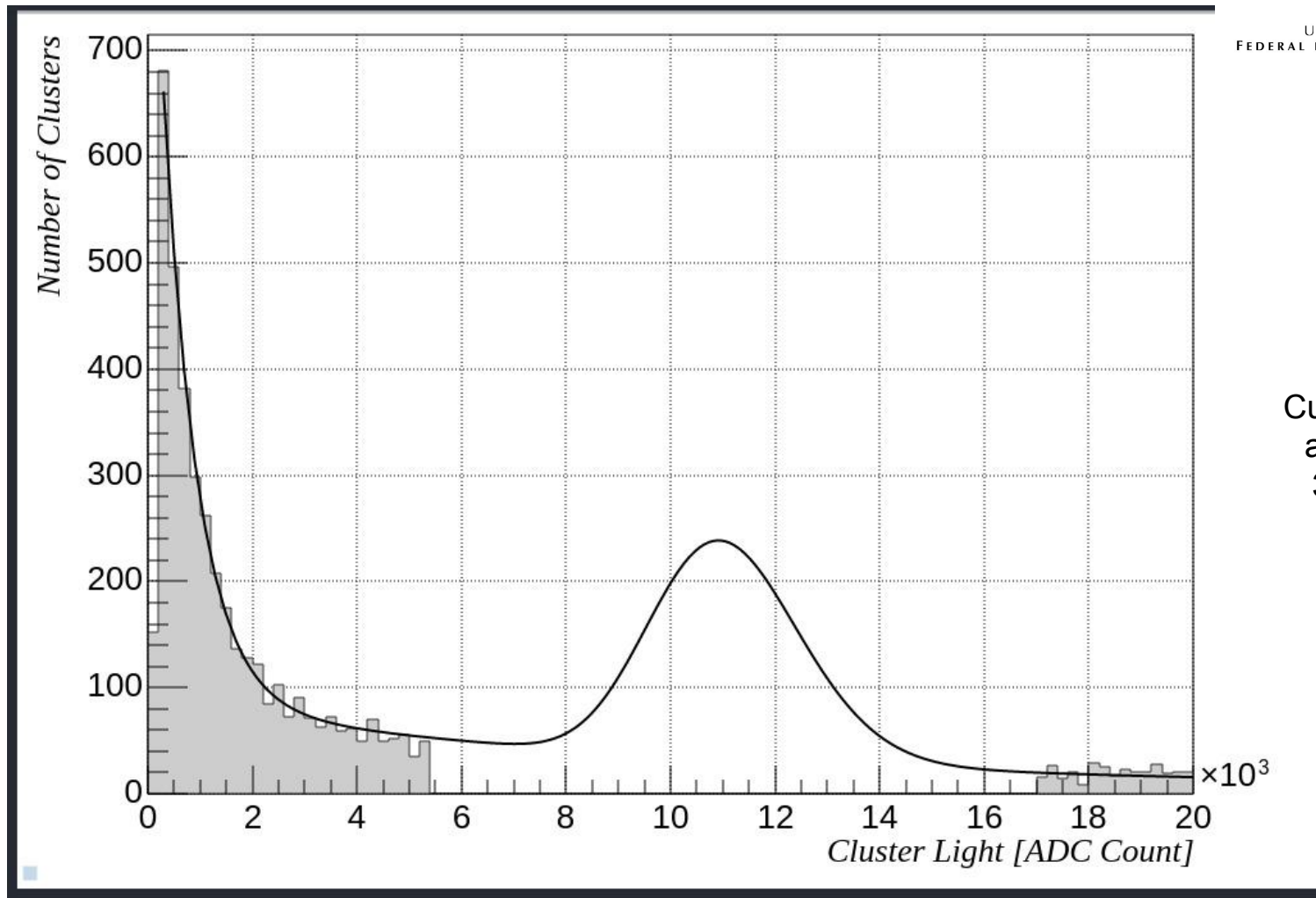
Thorit - Diferrence: 6361 - 6353: 0.5 keV



R.I.P. 6354







Cut performed  
at Mean +/-  
3\*Sigma =  
99,974%

# Conclusions

The work is under test and do not have any concrete conclusion yet.



## Next steps

- Each next step is defined according to the results found in the previous step.

**GRACIAS**  
**ARIGATO**  
**SHUKURIA**  
**JUSPAXAR**  
**DANKSCHEEN**  
**TASHAKKUR ATU**  
**GRAZIE**  
**MEHRBANI**  
**PALDIES**  
**BOLZIN**  
**MERCICI**  
**THANK**  
**YOU**  
**BIYAN**  
**SHUKRIA**  
**MERCI**

SPASSIBO  
SHACHALHUYA  
NUHUH  
CHALTU  
YAQHANYELAY  
WABEEJA  
MAITEKA  
HUI  
YUSPAGARATAM  
SUKSAMA  
EKHMET  
DHIANYABAAD  
AMSHA  
ATTO  
HERSI  
SPASSIBO  
DENKAUJJA  
NENACHALHYA  
UHALCHEESH  
HATUR GI  
EKOJU  
SIKOMO  
MAKETAI  
MERASTANNHY  
GAEJTHO  
AGUYJE  
FAKAARE  
KOMAPSUMNIDA  
MAAKE  
LAI  
MIRMONCHAR