Low Energy Efficiency

GEM1 V Scan Analysis

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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

Orca Quest

Thorit
Standard Deviation Evolution over Exposure Time

Orca_Fusion_BT_15440

Standard Deviation Evolution
Orca_Quest_C15550

THORIT_C11440

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
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 V energy simulation.
Orca Fusion (from 6 to 3 keV)

Expected Value: 9201 ± 498
Mean: 10028 ± 548
Sigma: 1279 ± 42
E.R.: 12.75

Expected Value: 5521 ± 298
Mean: 7623 ± 410
Sigma: 1016 ± 33
E.R.: 13.33

Expected Value: 7361 ± 398
Mean: 8953 ± 459
Sigma: 1245 ± 39
E.R.: 13.91

Expected Value: 5521 ± 298
Mean: 11004 ± 596
Sigma: 1461 ± 48
E.R.: 13.28
Orca Quest (from 2 to 0.3 keV)

Orca Quest - Difference: 6336 - 6328: 2 keV
Expected Value: 3035 ± 85
Mean: 6337 ± 141
Sigma: 304 ± 10
E.R.: 11.24

Orca Quest - Difference: 6337 - 6329: 1 keV
Expected Value: 1518 ± 43
Mean: 2918 ± 68
Sigma: 365 ± 75
E.R.: 12.51

Orca Quest - Difference: 6338 - 6330: 0.5 keV
Expected Value: 759 ± 21
Mean: 1519 ± 40
Sigma: 262 ± 4
E.R.: 17.25

Orca Quest - Difference: 6339 - 6331: 0.3 keV
Expected Value: 455 ± 13
Mean: 852 ± 26
Sigma: 203 ± 4
E.R.: 23.78
Thorit (from 2 to 0.3 keV)

R.I.P. 6354
Number of Clusters

Cluster Light [ADC Count]

Mean: 11124 ± 823
Sigma: 1433 ± 65
E.R.: 12.88
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.
Thank you