WP2: Analysis Summary

Highlights of the Month

G. Dho

07/03/2024

Reco code

DONE

- PMT analysis integrated (technical details in Marques' presentation at https://agenda.infn.it/event/40241/)
- Bugs introduced removed

ONGOING

- Update of autoreco to be run not only for LIME, but also for GIN and MANGO
- Study parameters for low gain
- Adapt code to re-run RUN2 with PMT and pedestal corrected

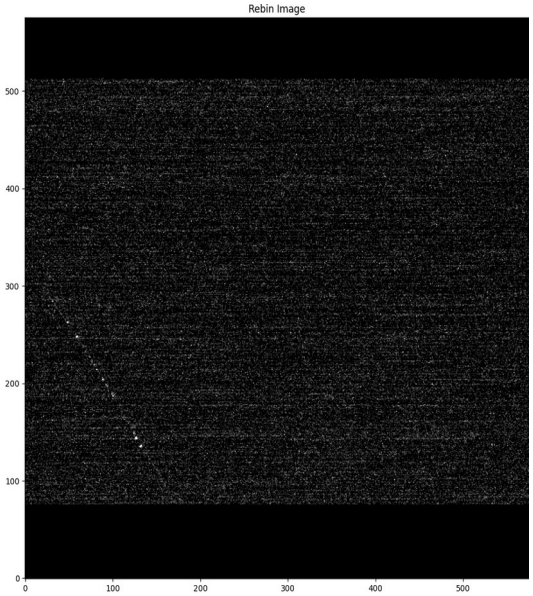
NEXT

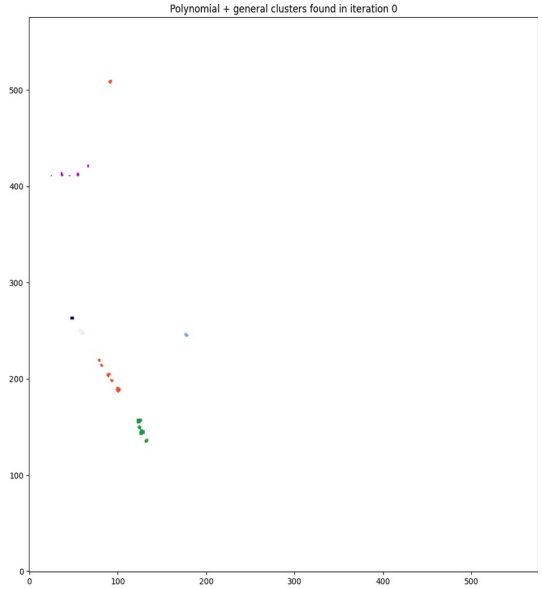
- Cleaning
- Rotation fix

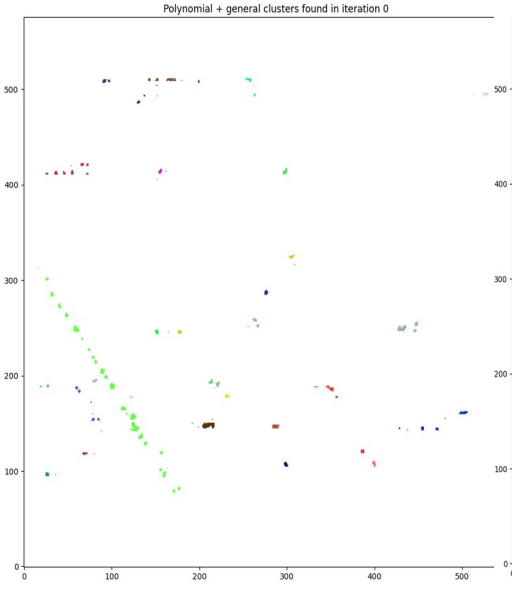
Study parameters for low gain

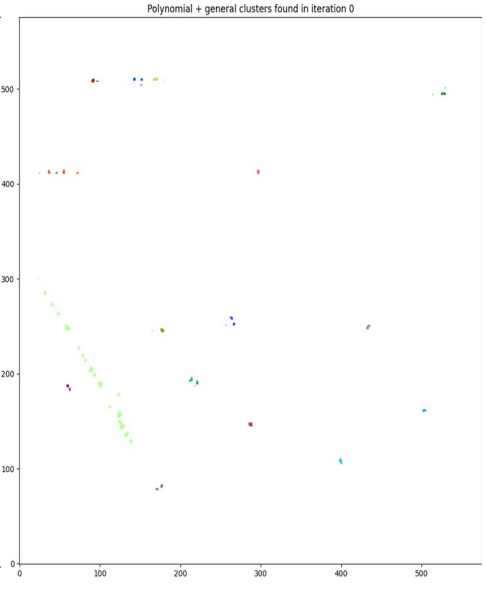
- Reaching the noise limits of the Fusion camera
- Clusters up to 1000 sc_integral may be just noise
- ^{55}Fe around 1900 sc_integral at step2
- Example of background image with different parameters

Best choice



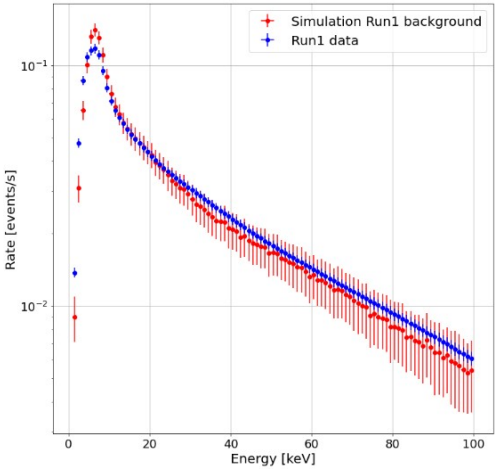


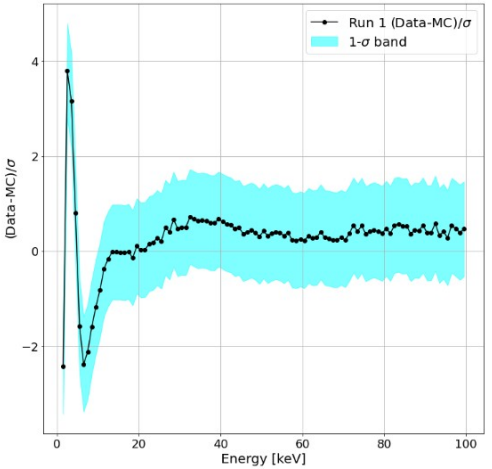


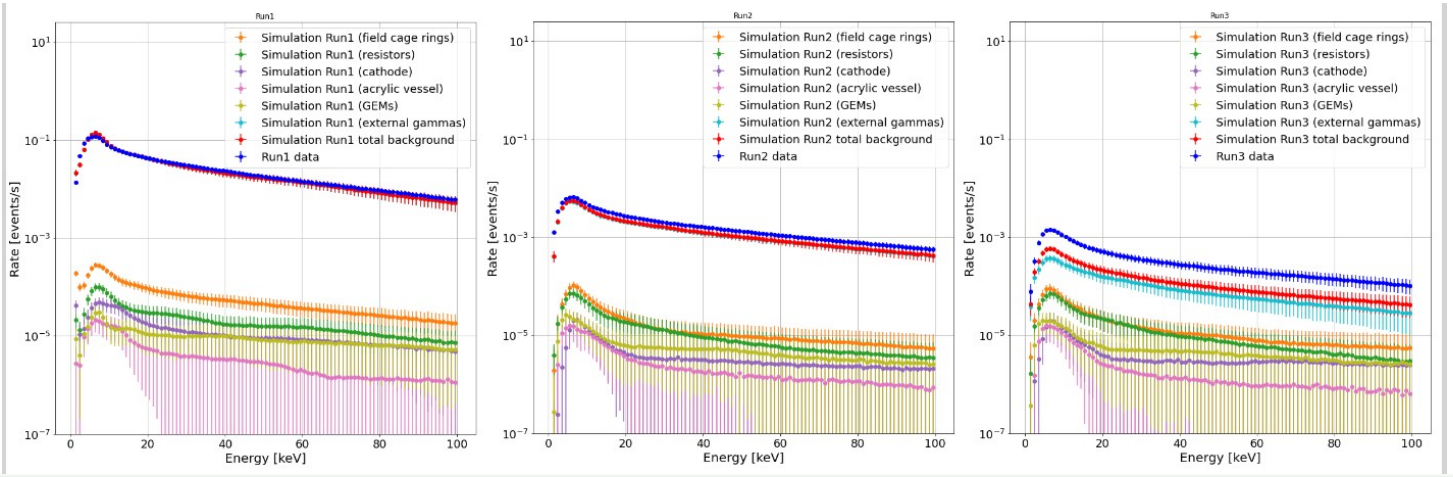


Large Summary of F. Di Giambattista's Work

- Recap of the GEANT4 simulation of LIME
- Data calibration of light yield and z depth methodology
- Description of selection cuts (quality, alphas, fiducial, MIP-like)
- Dead time evaluation
- Data–MC comparison Run1–2–3

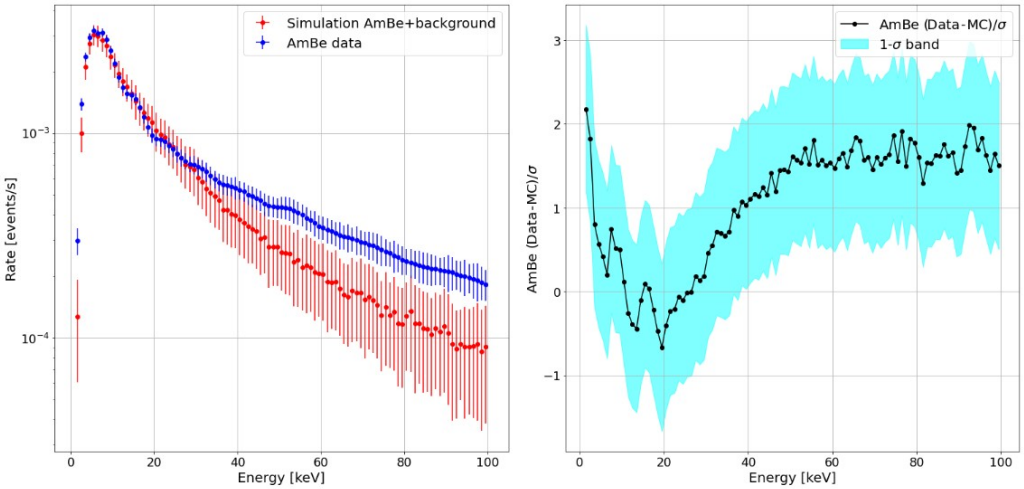


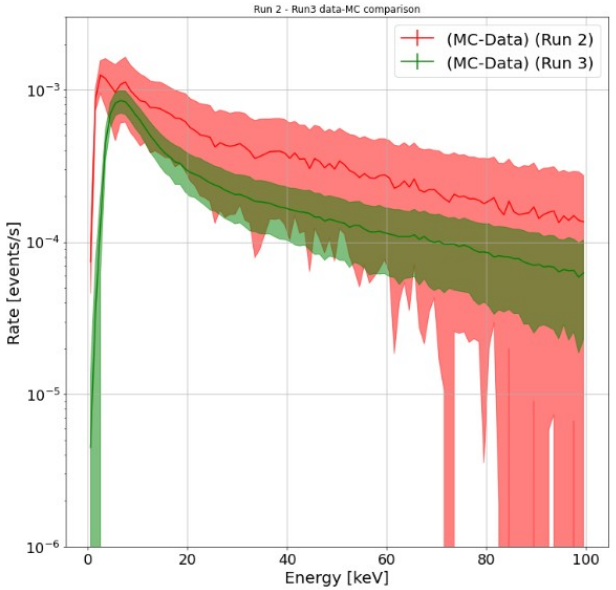




Large Summary of F. Di Giambattista's Work

- AmBe simulation matches at low energy very well
- Suggestion that a background contribution may be missing
- Excess at high energy matching alpha characteristics
- Still to be understood if can only be related to Radon entering or other contaminants
- NR selection efficiency with delta selection





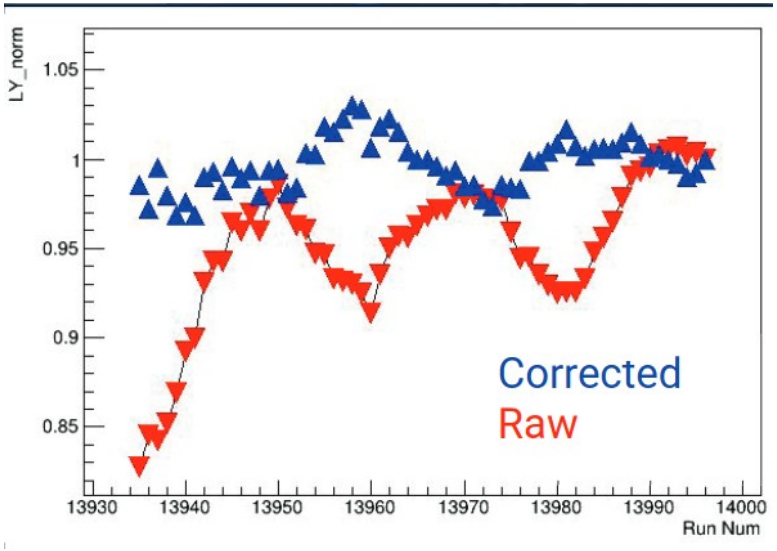
Full presentation

https://agenda.infn.it/event/40241/contributions/224321/attachments/116885/168596/meeting_dataMC_comparison.pdf

Pressure-Temp Correction MANGO data (D. Fiorina)

- Using MANGO data light yield was checked as a function of T and P
- Exponential with power law used to fit the data
- Correction return stability with a bit of overcorrection
- Large dependence on T. Should be checked for LIME as well (?)

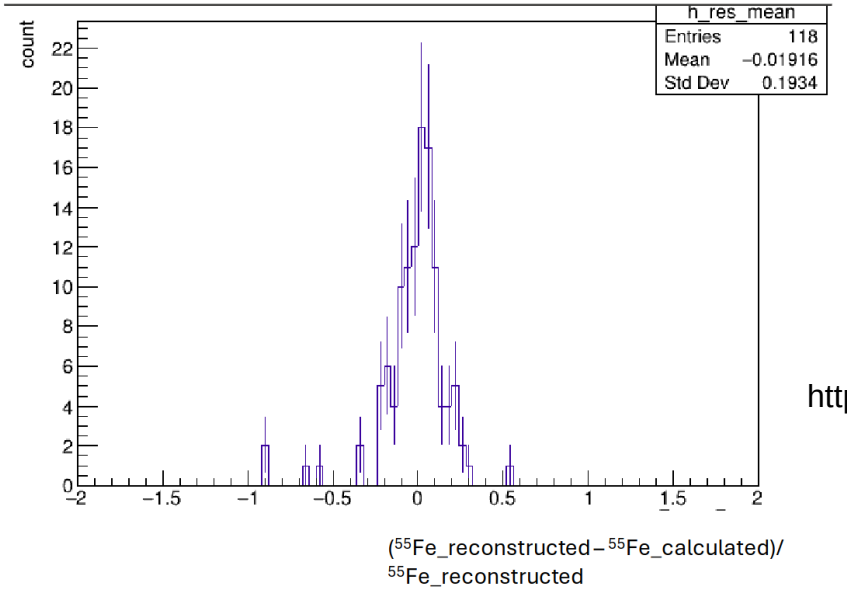
$$LY_{norm}(P,T) = \frac{1}{e}\exp\left(\frac{P0}{P}\right)^{a}\left(\frac{T}{T0}\right)^{b}$$



https://agenda.infn.it/event/40397/

LY30 (R. Antonietti)

- LY30 variable used to estimate the ^{55}Fe peak value when no calibration is available on LIME
- LY30 checked with ^{55}Fe averaging 20 runs
- Resolution of 19% in recostructing iron with a bias of –1%
- More statistics may be needed
- Production of table to correct response of LIME (^{55}Fe when available and LY30 when it moves more than 20%)



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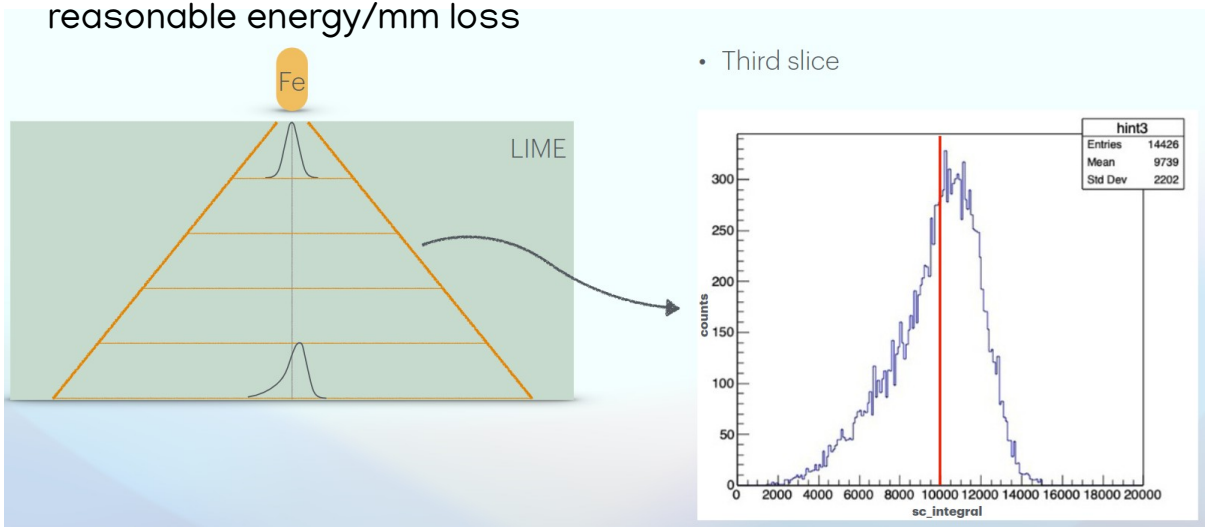
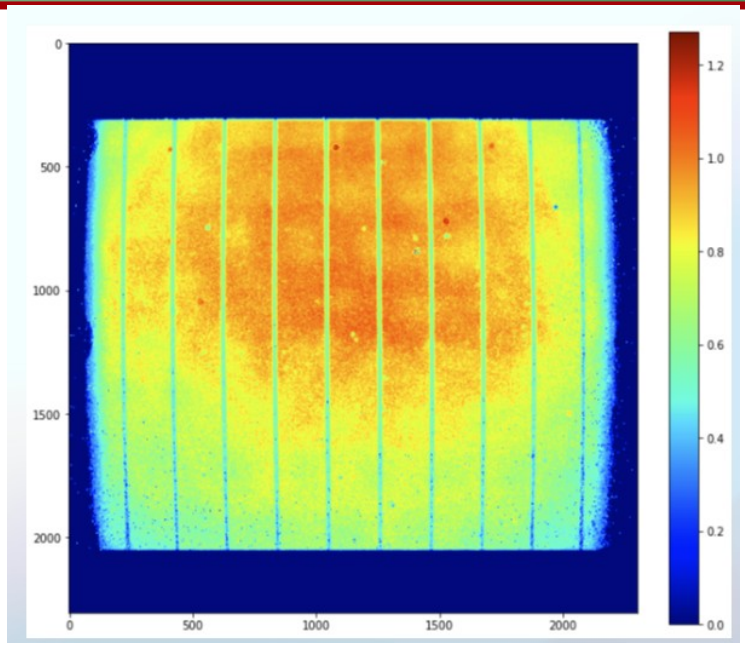
2D Correction Map Xcheck (L. Zappaterra)

https://agenda.infn.it/event/40397/

- How to use the map for intensity correction of LIME data generated with ^{55}Fe data
- Improvement of the energy resolution of ^{55}Fe at any distance (different z) and time (different months)
- Is map just an effect of saturation? No disuniformities are stronger than saturation effect. **To be further tested**
- First application to MIP (Eu data) looks promising returning a reasonable energy/mm loss





Let's start using it