



Quick look at LNGS - Runz first data

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- Run-2 of LIME (underground in Gran Sasso, with 4-10 cm Cu shielding) started on Thu, Feb 9th 2023
- These data are characterised by the very low occupancy of background from ambient radioactivity
- This allows yet another step of simplification of the reconstruction code
- -What has changed:
 - The noise threshold and filtering has been tuned
 - The eagerness of the directional clustering is very much reduced: only make long tracks with polynomial of order max 2 (parabola) and very strict χ^2
 - The gathering of the remaining DBSCAN is loosened, to cluster curly short tracks
- All the rest unchanged, image only reconstruction for now
 - New branch "winter23" in <u>GitHub repository</u>
 - Reconstructed runs taken 8-13 February 2023
 - Most with ⁵⁵Fe, few runs with no source and some pedestal runs







- Examples from run 6915 - 9 February 2023



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- Higher occupancy at the corners, effect of the noise amplification of the vignetting correction.
 - The correction is radially symmetric, so it seems that Top Right corner is really noisier: visible also in the pedestal runs









- Top two bumps correlated with higher sensor noise. Maybe a combination of noise \times amplification of the vignetting correction

















- Same x-y pattern of the light yield as in LNF

- => We could use the energy regression trained with LNF multi-source to correct also these data









- After applying the energy scale calibration



 Spectrum smoothly falling up to ~400 keV, then a contribution of (partially contained) tracks?







- Cluster lateral size (diffusion) $\sigma_{\rm T}^{\rm Gauss} \approx 700\,\mu{\rm m}$
- Clusters with length up to 30 cm (sensor-wide) are observed: so even tracks not completely contained



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- Definition of long tracks: L > 5 cm
- Definition of short tracks: L < 5 cm with round aspect ratio (slimness ~1)
 - Fake spot-like clusters can be highly suppressed removing the vignetted corners









- Sum of the energy for all reconstructed clusters incompatible with noise

