





Preliminary high energy analysis of the demonstrator

BULLKID's digest - 14/05/2025

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Experimental setup



LED calibrated energy spectrum



LED calibrated energy spectrum



Fitting strategy

Fitted the peaks in two intervals in the uncalibrated [mrad] amplitude. Assumed a **linearly decreasing** background and **fixed the relative position and intensity of the peaks**. In each interval, assumed the same sigma for all the peaks.



Calibration function





Calibration function

From the fits we can evaluate the responsivity and the **non-linearity** coefficient



Is this a peak of ²¹⁰Pb?



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Fitting of the candidate for ²¹⁰Pb peak



Energy spectrum [3.0,50 keV]



Cut efficiency still missing

The analysis is still ongoing for the presentation of the final background in d.r.u since the cut efficiency is not trivial. **LEDs at high energies are not fully representative of the bkg**



Conclusions

- A preliminary high energy background analysis has been performed and we have compatibility between the two main pixels
- We observe several structures and peaks that we identify has the X-rays (and possibly gammas) of lead. Such structures allows the calibration of the spectrum independently from LEDs
- I will work on the evaluation of the cut efficiency for the presentation of the energy spectrum in d.r.u



Thank you for the attention

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