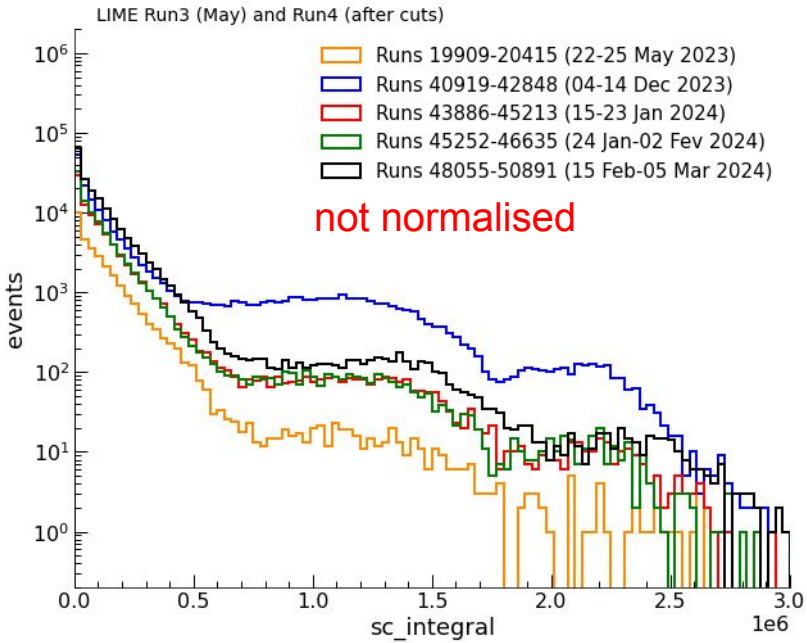
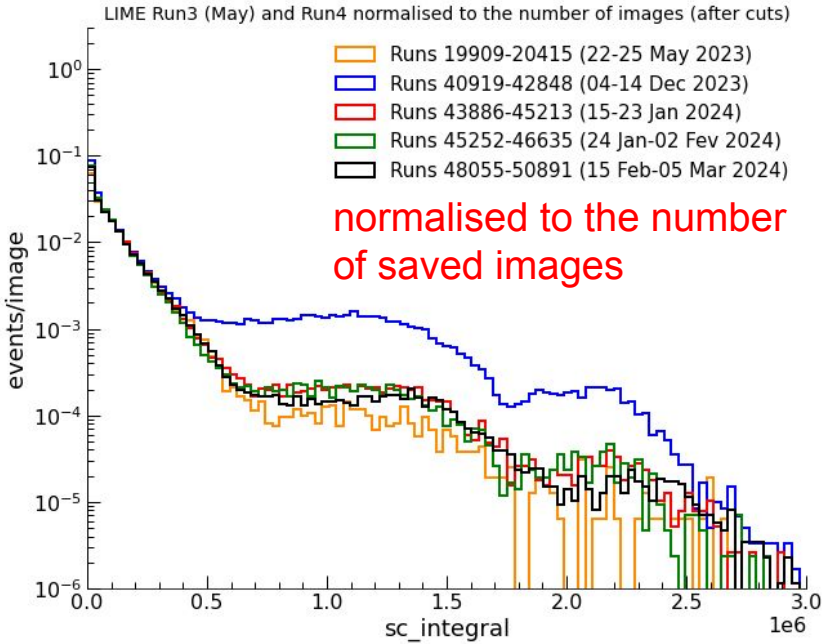
Rate RUN4 from spectra

Normalisation to the number of saved images

- The data normalisation that I presented so far was done using the **total number of saved images** for a certain range of runs.
- Example: energy spectra of the background runs

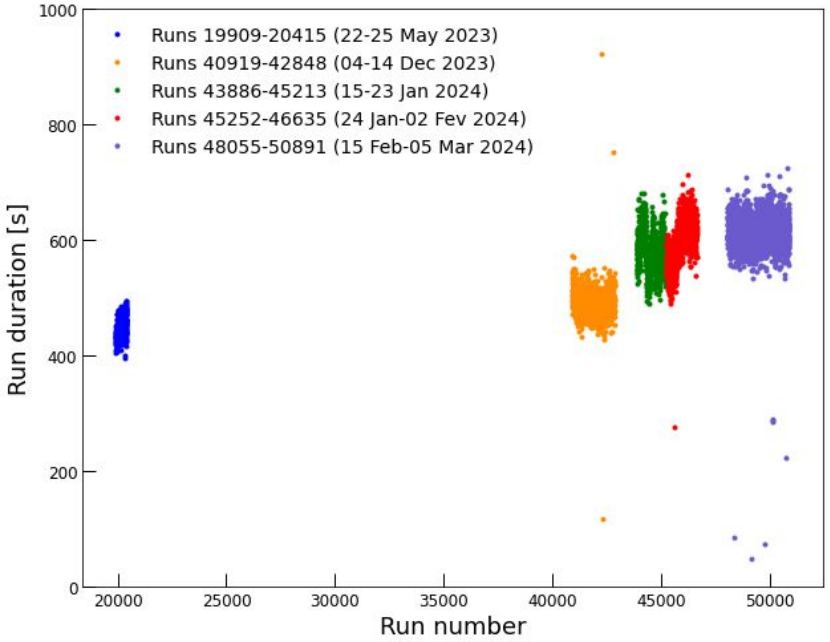


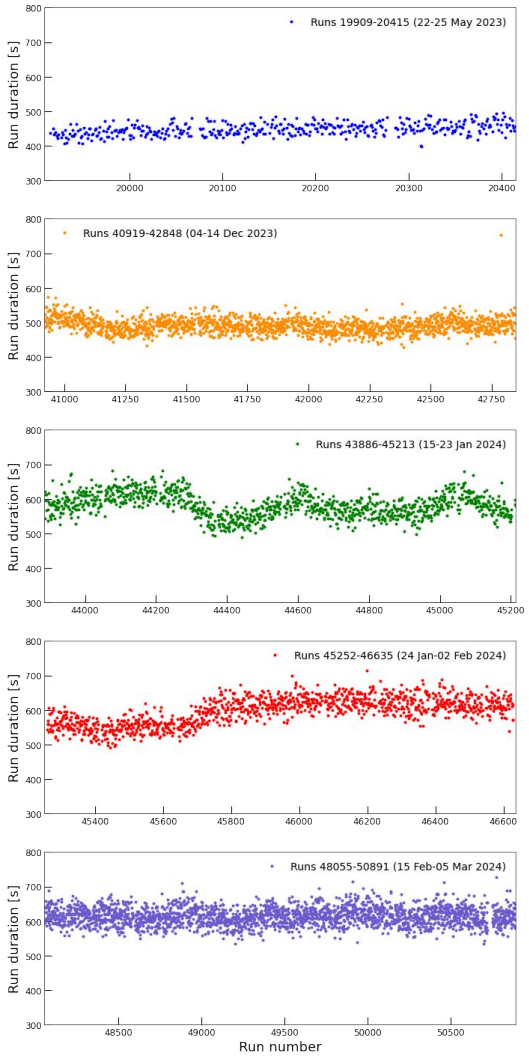


- The problem is that **this does not take into account the number of images that were lost and, consequently, the total time the detector was active**.
- 1 run consists of 400 events, but if there are a lot of images lost for a specific run, that run will have a longer duration.

Run duration

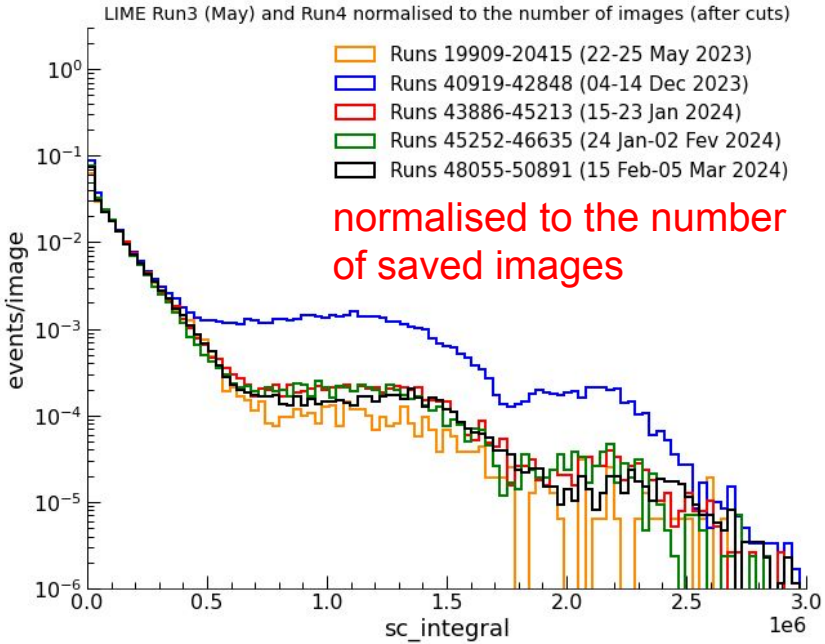
- One can notice that depending on the period of time, the time duration of a run may be different (different background levels).

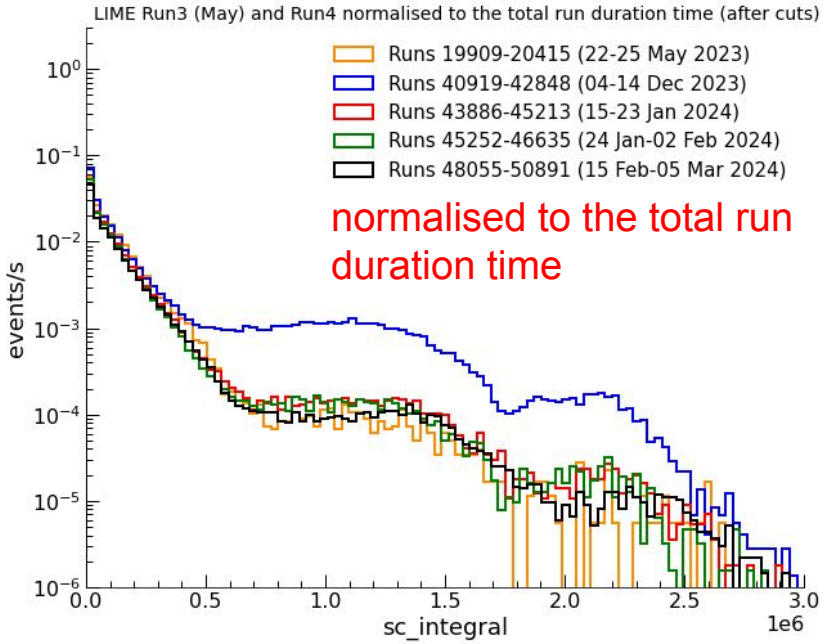




Time Normalisation (preliminary study)

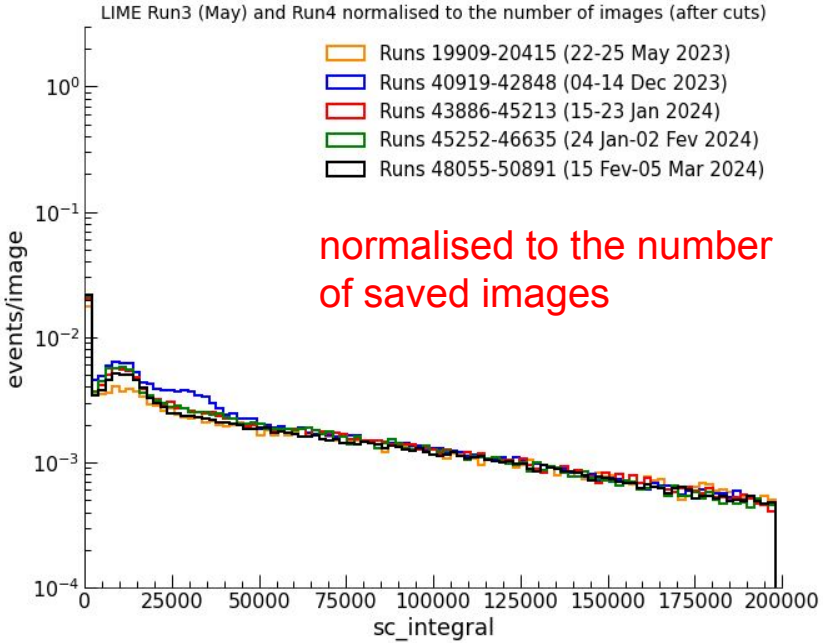
- The duration of a specific background run was calculated (difference between the "start_time" and "stop_time" variables present in the data logbook).
- Then, for a certain range of background runs, the sum of the duration of each run in that interval is done to get the total duration of the data acquisition campaign.
- Finally, the normalisation factor is applied to the histogram: (1/total_duration)*daq_inefficiency_factor, obtaining a histogram of the rate of events.

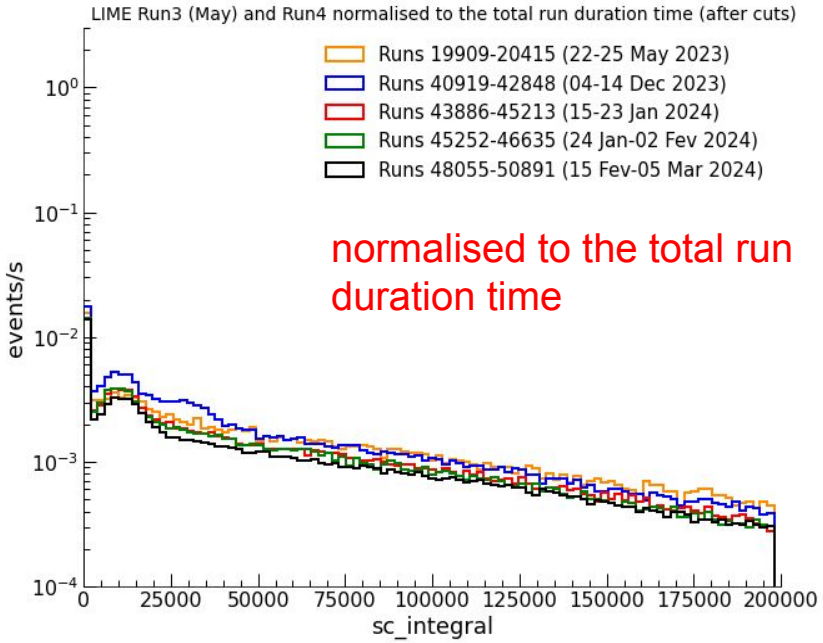




Time Normalisation (preliminary study)

- In the lower energy region, the differences between the two normalisations are more visible:





- However, there may be a more accurate method to calculate the rate of events.

Next step

- Using the study of the estimation of lost images performed by Stefano, the normalisation will be done using the total number of images (saved + lost) multiplied by the exposure time of the camera (300ms).