SSD online calibration

Paul Filip, Ricardo Sato, David Schmidt
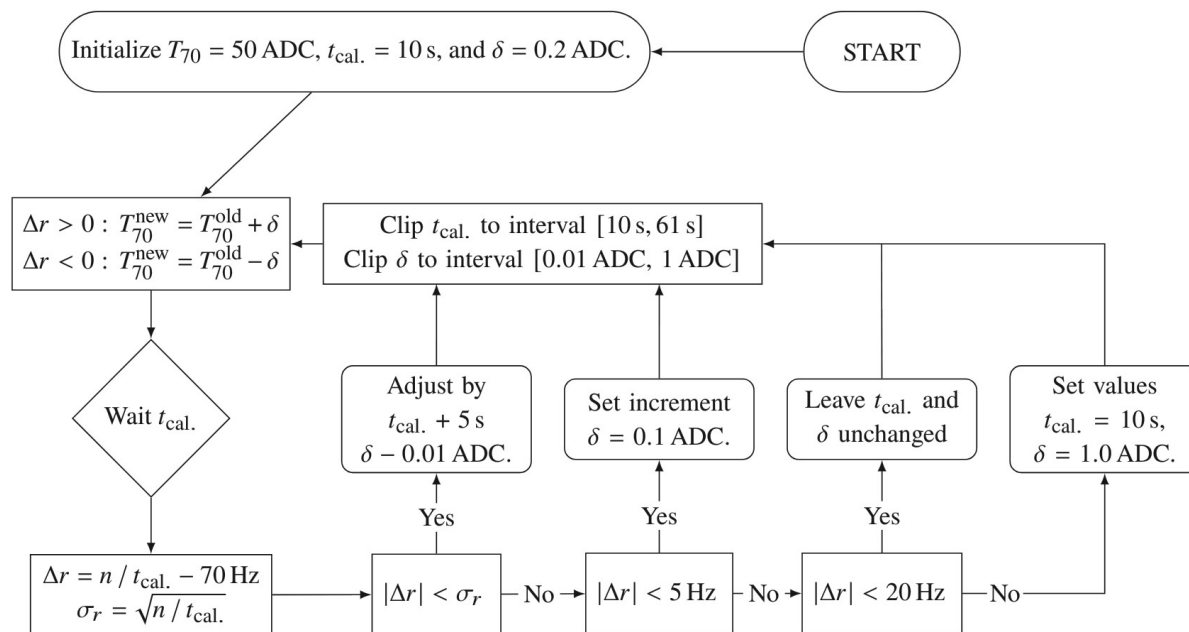
Outline
- Recap
- Histogram vs. Rate offset
- CDAS/LS implementation
- Summary and outlook
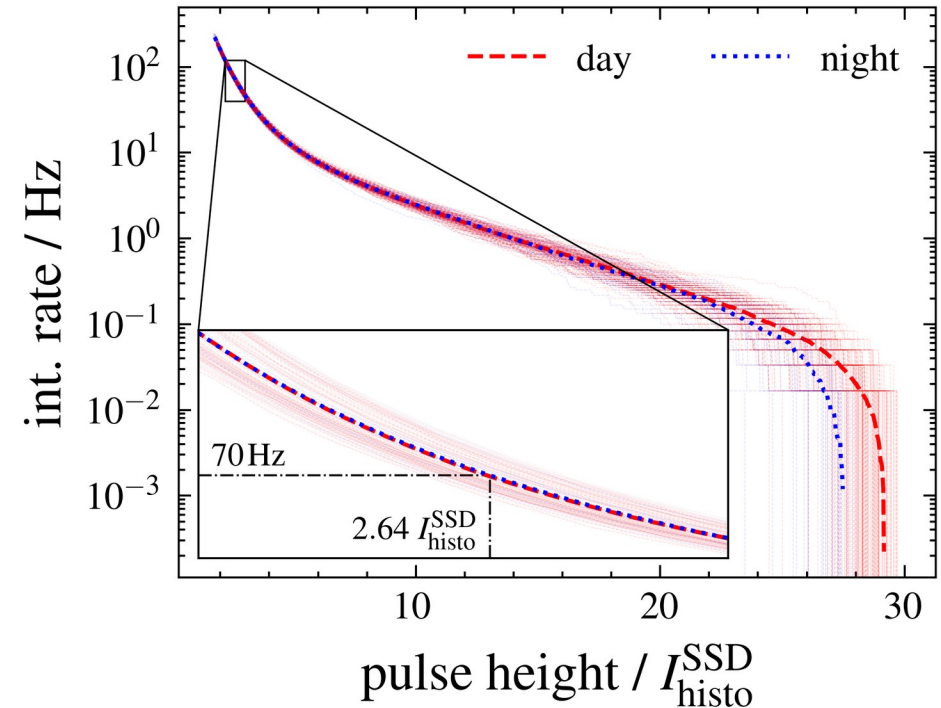
Recap

- Estimate MIP peak independently for LS

- Monitor SSD performance/exposure, trigger on scintillators

- Accurate to ~5% *

- **GAP2024_023**

- **GAP2024_065**
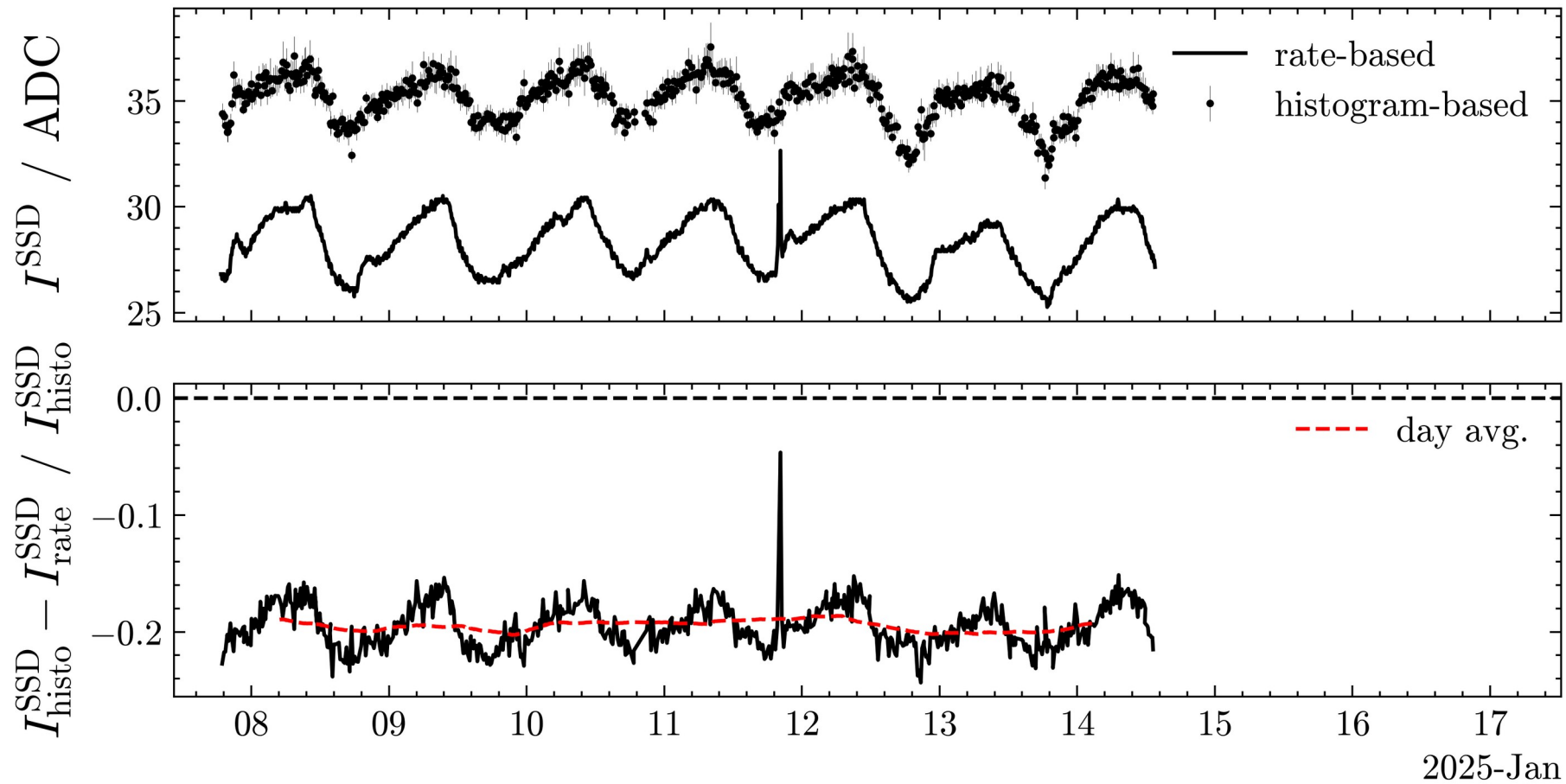
- PoS **UHECR2025**, 085

Recap

- T70 trigger threshold correlates strongly with MIP peak

- Get rate-threshold-relationship from dedicated acquisition

- Very similar to WCD calibration
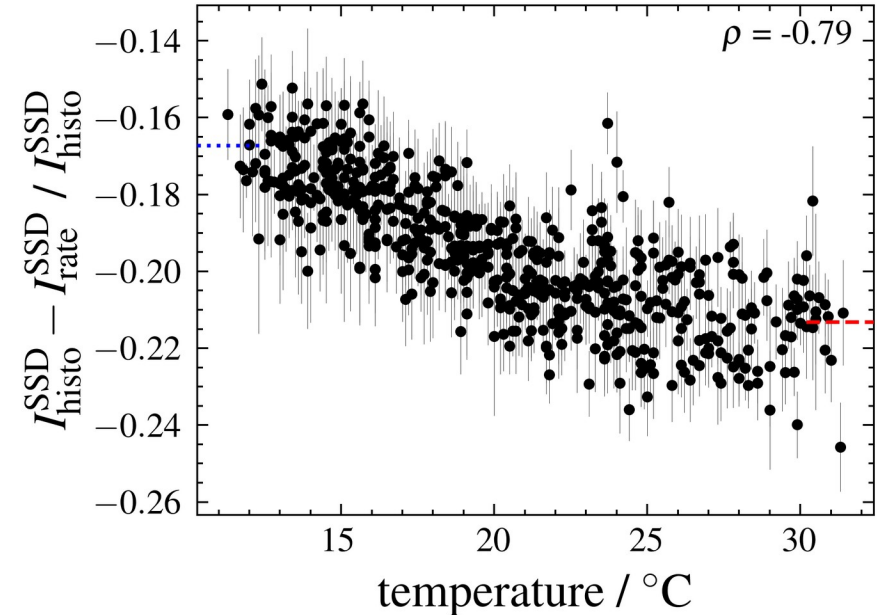
- Different implementation in LS

Histogram vs. Rate offset

Histogram vs. Rate offset

- ~15-20% offset when comparing offline/online MIP peak

- Temperature modulation ~5% small, but expected

- Station (hardware) independent

- No (big) seasonal fluctuations

- Independent of threshold cut

- Different station configuration during dedicated acquisitions?

CDAS/LS implementation and performance

- Performance in LS DAQ:
  - Different trigger settings!
  - Muon histograms unaffected
  - ~2% overhead in CPU usage
  - >5000 hours of stable DAQ

05/03/2025

paul.
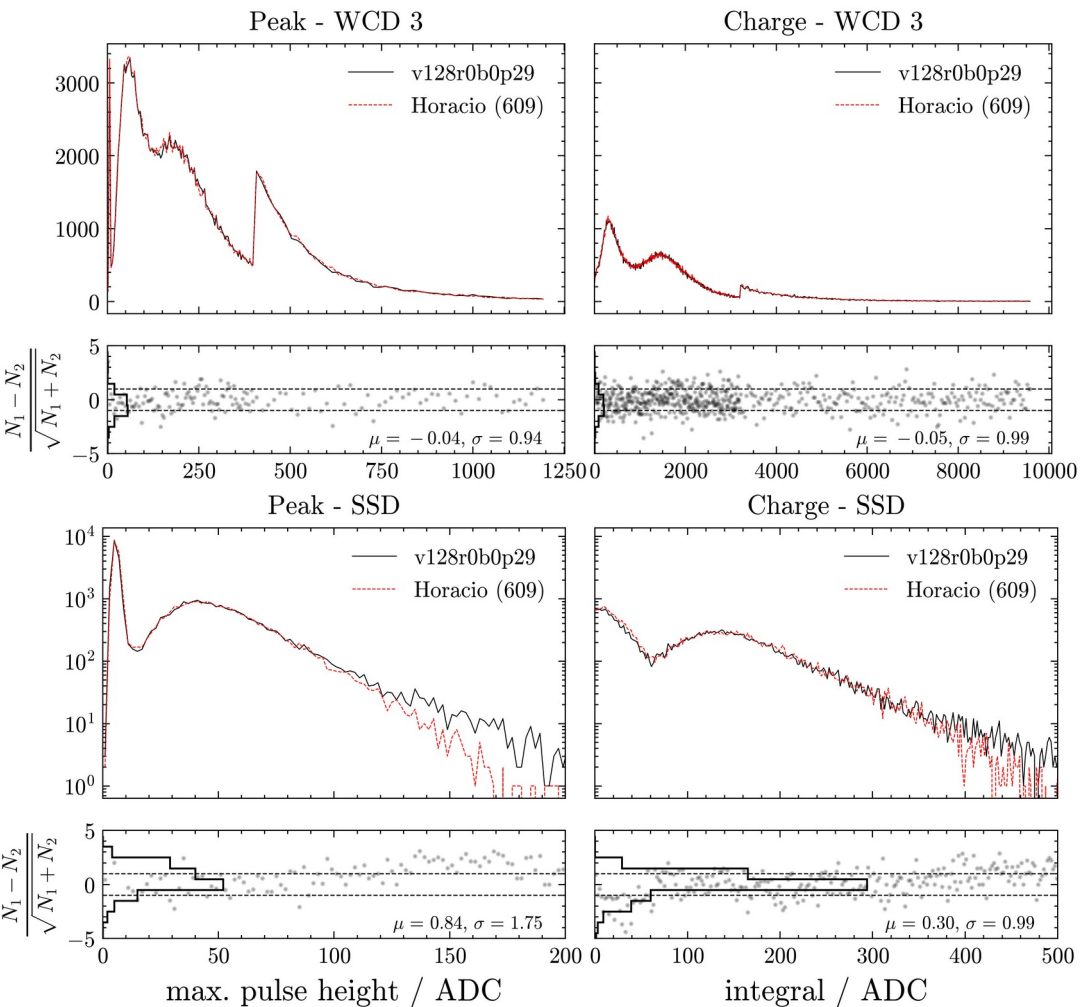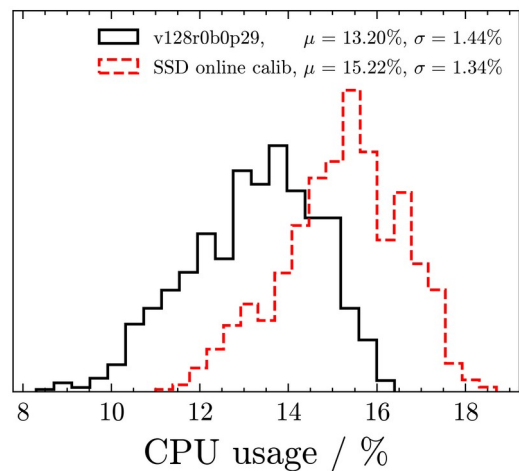
CDAS/LS implementation and performance

- Implementation in CDAS

  – Online MIP Peak and T70Rate implemented in CalMon & ready to go

  – Information not yet passed to sd_* files
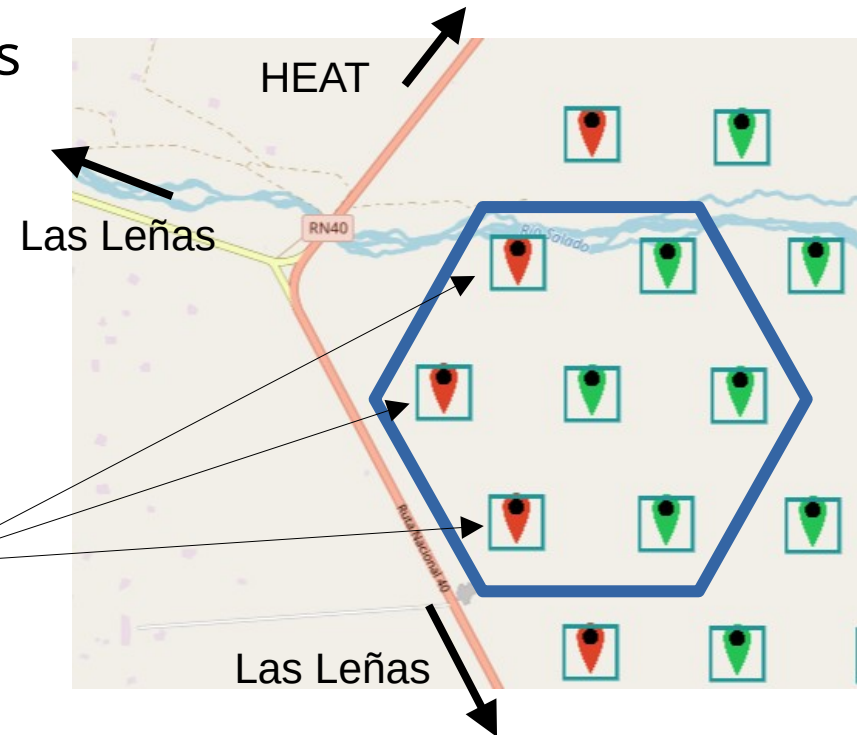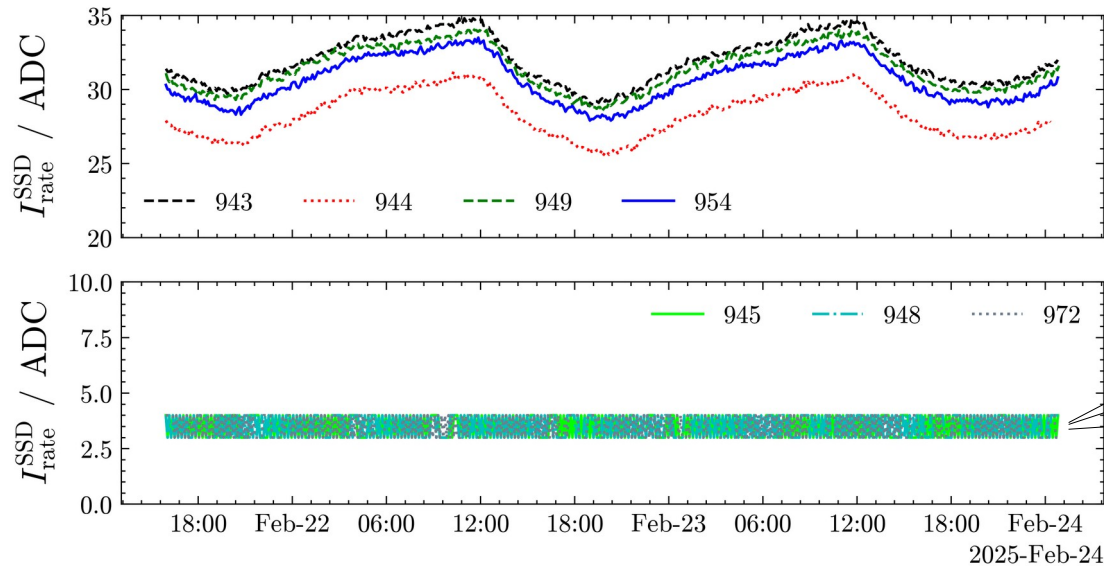
Summary and outlook

- SSD online calibration fully implemented in UUB DAQ *

- CDAS status: Implemented in Mr (mc files), **not** yet in Eb (sd files)

- Deployment to full array planned once Eb implementation done

- Define SSD-ToT like trigger with new SSD online calibration

- Analyse trigger efficiency & background trigger rate

     $\longrightarrow$ **Photon search?**

Backup

SSD-ToT, 122.1 s of DAQ