

Ideas for FD Optimization

... sparse and qualitative



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Increase the FD performances

- Higher duty cycle
 - gain adjustment and corresponding dedicated calibration (before and after gain variation)
- Interference filters to increase the FD signal vs NSB ratio (expensive but might be worth)

Alternative light collection devices / optics

- Use of SiPM (LHAASO like): cost effective and reduction of camera size
- Different design to reduce the camera reflectivity?
- alternative optics (Fresnel lens?) for modular FD design

Extension of the sensitivity

... towards the highest energies

- Measurement in combination with surface array with larger area (increasing the spacing of SD detectors), to avoid limiting the increase of the FD exposure with energy:
 - Mass composition studies
 - GZK spectroscopy
 - search for UHECR sources

... towards the lowest energies

- higher gain and faster electronics in combination with more effective noise filtering (see previous slide):
 - Multimessenger (neutrino astronomy)

Atmospheric monitoring

- Has been proven to be very delicate point for the determination of the energy scale
- Increase sensitivity to very low aerosol content
- Horizontal uniformity of atmosphere
- Enhance the potential of stereo FD design

Calibration absolute/relative

- Adding a close by laser for calibrating FD to minimize atmospheric effects
- Very flexible calibration system to cope with a changing gain (over-night) design