

Long Term Performance Task

Minutes of call

May 18, 2018

Overview meeting to review what is known so far, which questions need to be answered within the task and to collect further issues related to the evolution of the detectors.

The plan is to have bi-weekly meetings. The next meeting is foreseen for the *31st of May*.

Participants: Jose Bellido, Rossella Caruso, Bruce Dawson, Mariano Del Rio, Olivier Deligny, Francesco Fenu, Ioana Maris, Daniela Mockler, Lorenzo Perrone, Francesco Salamida, Ricardo Sato, Eva Santos, Michael Unger, Valerio Verzi, Aleksey Yushkov

1 Ioana's slides

Overview of questions to be answered within the task. Two main parts:

- Hardware related: Aging of PMTs for SD/FD, hardware usability until 2025, implementation of SD/SSD shift.
- Analysis related: Time evolution of observables \rightarrow which corrections need to be done. Needs input from physics task leaders and close collaboration among the tasks.

Known so far:

- SD event rates: Looking into the normalized event counts, SD-1500 data shows strange behavior for the years 2004-2006. Explainable by growth of array in this period. Slight decrease in event numbers over the years, event loss around 0.5% or less. SD-750 data shows problems in the first two years. Stable event rate afterwards. As the array is rather new, more data is needed for a better understanding of the time evolution.
- SD trigger efficiency: No clear picture when looking into the trigger efficiency derived from hybrid data for different years. Only slight deviations visible.
- Risetime: Average risetime including all stations $< 60^\circ$ shows constant decrease.

- Fisher discriminator for neutrinos: constant with time for zenith angle range of $75 - 90^\circ$. But evolution with time visible for smaller zenith angles between $60 - 75^\circ$.
- AoP for inclined events is stable.
- HEAT: Evolution of HEAT calibration with time.

2 Rossella's slides

Overview of items covered by the task on the FD side.

- FD operations: FD status on site and during shifts (weather conditions, status of monitoring systems, etc.), FD shifts (planning, quality, reports, etc.), FD remote shifts
- FD long term: Study detector stability in time, check data quality, status of FD databases, energy scale stability
- HEAT long term: Study HEAT stability in time, check data quality, study cross calibration of HEAT-CO
- Hybrid long term: Hybrid reconstruction on time, check hybrid rate, energy scale stability
- AugerPrime: Study possible impacts of extended FD uptime on FD long term performance

Humanpower needed to perform cross check studies.

Questions

Bruce: Where to address duties like cleaning of mirrors etc?

→ Related to calibration task rather than Long Term Performance. Interface with local staff: Mariano

Ioana: Is there a document about events that happened to the array (e.g earthquakes, raining PMTs, etc). → Ricardo will start to look into this with the help of the task to provide a condensed journal of events

Lorenzo: Future SD shifters can report about events happening to the array/status of the array during shifts

3 Lorenzo's slides

- Fatal data crash happened in November 2017 with a basically complete data loss. Impacts long term studies
 - hybrid ontime plot could finally be reproduced. Currently, root files are available until the end of October 2017, hopefully files until the end of May 2018 available by the time of the Krakow meeting.

- FD shift reports: Currently delayed due to CDAS electrical failure in November 2017. Hybrid data needs to be copied back from Lyon to Malargue.
- FD shift: Software has been updated to the Offline trunk.
- FD cal. DB status: 2016+2017 are done, as well as first few months of 2018. More to follow. Input required for Aerosol DB.
- Cloud DB: new data available within ~2 months
- Energy scale stability: No data after 2015 a.t.m
- Valuable long term performance study available as GAP note (2018-011), includes e.g running calibration constants, detector and energy scale stability.

Questions

Francesco S.: Could shift reports be available faster/when are they normally available?

→ Current delay due to problem with hybrid data. Normally available after shift. FD mono reconstruction can be run after each shift night and is done by the following night.

Further (current) detector issues

Ricardo: Ground at some stations is eroded, strange signals in stations, fixing is ongoing

Mariano: LL electronics - false triggers, fixing is ongoing. LM has 5 electrical posts down and LA has one electrical post down due to storm. Some are fixed, more fixing ongoing.

Please fill the wiki with relevant GAP notes and plots.