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The LAGO project Web Monitor



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The space weather program of the LAGO project aims to study the galactic cosmic ray modulation estimated from the measurement of secondary cosmic ray flux in the network of detectors of the project. The experiment consists of several water Cherenkov tanks located at different altitudes, ranging from sea level (Lima) up to 5000 meters above sea level (Chacaltaya), and latitudes, which span most of Latin America from 18°59' N (Sierra Negra) to 41°09' S (Bariloche). The operation of a detector in the Antarctica is also being considered.

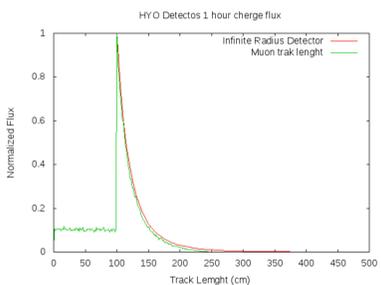
In order to monitor the flow of secondary cosmic rays, a dedicated web monitor has been developed. The monitor automatically calibrates the flow of charge deposited in the detectors every hour, correcting for the long term loss of sensitivity as well as for pressure. The cosmic ray flux, measured by the detectors in bands dominated by different types of particles, is shown hourly.

Calibration

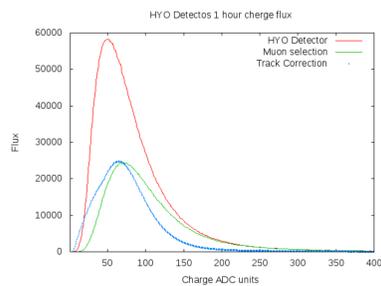
Using the approximation for infinite detector we relate charge histogram of muonic contribution $F(q)$ with VEM distribution:

$$F(q) + q F'(q)/5 \approx V^{EM}(q)$$

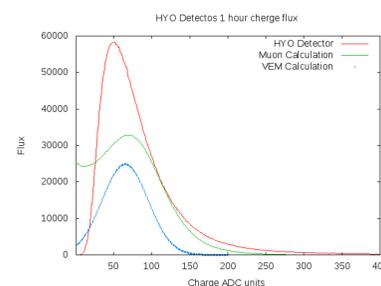
For our detector muon track distribution agree with this approximation.



One hour track length distributions (grey) of muons going through HYO detector with height ($H = 100$ cm $R = 120$ cm) and infinite surface model.

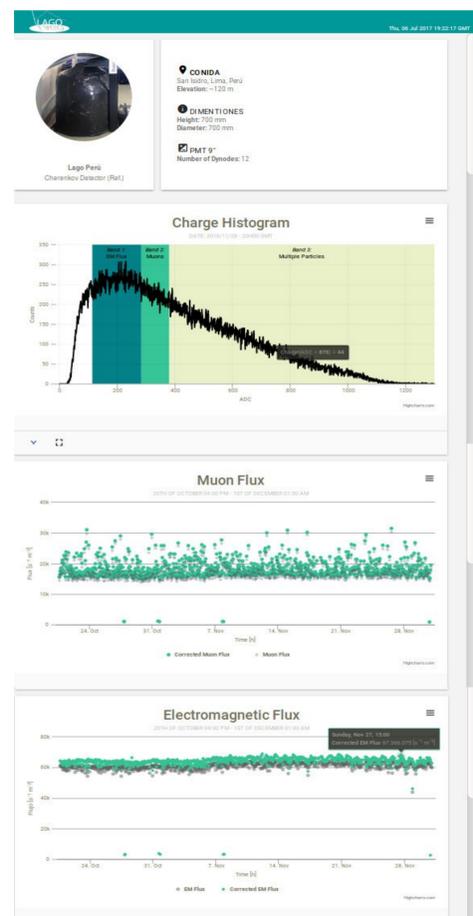


One Hour charge histogram HYO detector (Red), muon selection from first (green) and muontrack correction (blue).



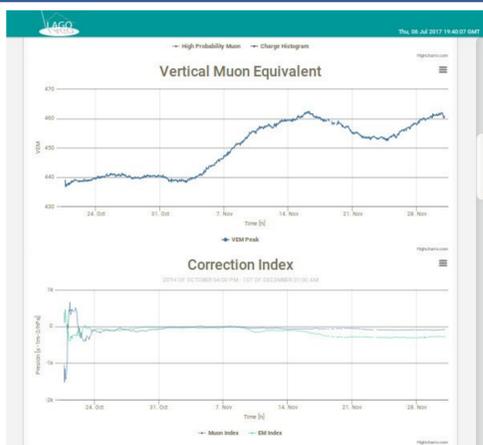
One Hour charge histogram HYO detector (Red), compared to total muon calculation (green) and VEM contribution calculation (blue).

Web Monitor (Public)



Print screen of the web monitor developed for the detectors in the LAGO project, top-down: detector characteristics, particle flow divided into bands, total flow in the muon band hourly, total flux in the electromagnetic band hourly.

Web Monitor (Private)



Print screen of the private information of the web monitor, top-down: VEM value hourly, pressure correction index hourly.

Conclusions

The analysis and results of the two detectors in Peru and show that we have a viable method for the rapid calibration of the data of the LAGO network detectors. In addition, the method must be validated, for this more detectors must be analyzed and independent measures of VEM of histograms must be obtained

Acknowledgments

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