Executive Summary

Update on the Combined Analysis of Muon Measurements from Nine Air Shower Experiments

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<u>What is this contribution about?</u>

- The combined meta-analysis of measurements of atmospheric muons in EAS from a few PeV to tens of EeV by nine experiments

<u>What has been done?</u>

- Cross-calibration of the energy scales of experiments and subtraction of the mass-dependence of the muons measurements
- Fit to the data with a systematic statistical analysis and comparison with current hadronic interaction model predictions

<u>Results:</u>

- Muon excess w.r.t. all model predictions is observed in data, increasing with EAS energy
- The slope of the fit to this excess is significant at $\sim 8\sigma$ (EPOS-LHC) and $\sim 10\sigma$ (QGSJet-II.04)
- When removing individual experiments from the fit, slope significant with about $\gtrsim 3\sigma$ (EPOS-LHC) and $\gtrsim 5\sigma$ (QGSJet-II.04)