Executive Summary

Multiple Particle Detection in a Neutron Monitor

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What is this contribution about?

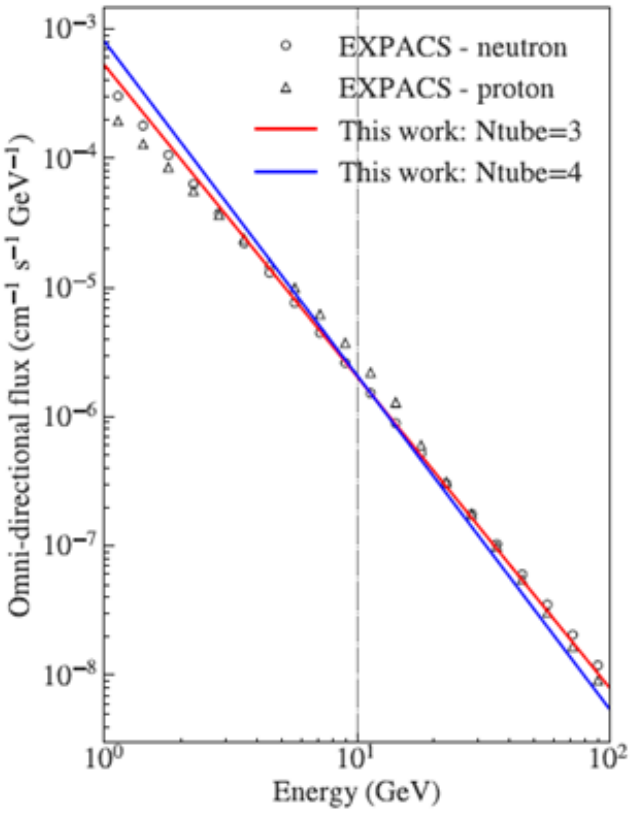
We are developing a ground based method to determine, with high statistical accuracy on a short timescale, the energy spectrum of secondary particles resulting from atmospheric interactions of primary cosmic rays with energy higher than 17 GeV. Eventually this will be used to estimate the primary spectrum.

Why is it relevant / interesting?

Effects of the 22 year magnetic cycle on solar modulation in this energy regime are poorly understood. The expected lifetime of AMS is not sufficiently long to return the required data.

What have we done?

We record the arrival time of each interaction in the 18NM64 at Princess Sirindhorn Neutron Monitor on Doi Inthanon in Thailand (2655 m elevation, 17 GV geomagnetic cutoff) with an absolute accuracy of two microseconds. We then identify patterns in multiple interactions in groups of detectors that are characteristic of the interaction of individual secondary particles. From the size spectrum of these interactions we deduce the spectrum of the incident particles.



What is the result?

We get excellent agreement with calculations of the expected spectrum of secondary particles.