

Cosmic-ray muon observation in Brazil

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The present network of cosmic-ray muon detectors has a big gap in directional coverage over the Atlantic and European regions. Owing to this gap, we were not able to analyze 43.6% of storms. This gap also made it impossible to analyze the intensity distribution over an entire range of pitch angle and to precisely determine the appearance time of precursors.

To fill this gap, we started a preliminary measurement using a small muon detector installed in Santa Maria, southern Brazil. In this report, we will evaluate the performance of this new instrument. Hopefully, we will also analyze the data together with the present network data and examine how the precursors are seen in a full range of pitch angle.

By analyzing galactic cosmic-ray intensity recorded by multi-directional muon detector network, we could show that 89% of large magnetic storms with maximum Kp-index greater than 8.0 were associated with precursors seen in the pitch-angle distribution of cosmic-ray intensity in space (Munakata et al., JGR, 105, A12, 27457,2001). The present network, however, has a big gap in directional coverage over the Atlantic and European regions. Owing to this gap, we were not able to analyze 43.6% of storms. This gap also made it impossible to analyze the intensity distribution over an entire range of pitch angle and to precisely determine the appearance time of precursors.

To fill this gap, we started a preliminary measurement using a small muon detector installed in Santa Maria, southern Brazil. In this report, we will evaluate the performance of this new instrument. Hopefully, we will also analyze the data together with the present network data and examine how the precursors are seen in a full range of pitch angle.