



Contribution ID: 80

Type: **Poster**

Investigating the Correlation Between Muon Flux Variations and Atmospheric Conditions

Saturday 20 April 2024 17:45 (5 minutes)

Motivated by the potential insights into Earth's weather, we investigated the correlation between muon flux and meteorological parameters, including atmospheric pressure at sea level, temperature, and humidity. Utilizing muon detectors comprised of plastic scintillators and photomultiplier tubes, we monitored the muon flux over February and March 2024. We performed a detailed analysis of the unevenly spaced dataset to discern patterns and correlations between muon flux variations and the specified atmospheric conditions. Preliminary results demonstrate a notable negative correlation between muon flux and atmospheric pressure (average correlation coefficient: -0.15), suggesting increased muon absorption at higher pressures. A similar analysis revealed a positive correlation between decreasing temperatures and muon flux reductions (average correlation coefficient: 0.20), while humidity exhibited a minimal correlation (average correlation coefficient: 0.10). Intriguingly, during specific time intervals, such as between January 30 and February 4, 2024, we observed heightened correlations, with pressure and temperature correlation coefficients reaching -0.66 and 0.69 , respectively. These observations suggest a substantial influence of atmospheric conditions on muon flux levels. In conclusion, the study elucidates a significant relationship between muon flux variations and atmospheric parameters, particularly pressure and temperature. These findings not only enhance our understanding of particle interactions with Earth's atmosphere but also highlight the potential of muon flux monitoring as a tool for atmospheric and particle physics research, paving the way for future studies in this promising interdisciplinary field.

Author: HAO, Jiayi (SJTU)

Presenter: HAO, Jiayi (SJTU)

Session Classification: Poster (For two days)