Contribution ID: **264** Type: **Poster**

Researches on the atmospheric conditions over the LHAASO

The atmosphere is primarily composed of air molecules and aerosols, and also contains water vapor. Changes in these components can affect the intensity of Cherenkov light or fluorescent signals in extensive air showers, thereby influencing the reconstruction of the energy of primary cosmic rays and the determination of the atmospheric depth (denoted as Xmax) at which extensive air showers reach their maximum development. In addition, air molecules scatter as Cherenkov light or fluorescence propagates from its point of origin to the telescope's reflector, while the optical thickness of aerosols and water vapor can attenuate Cherenkov light or fluorescence. Therefore, changes in the atmosphere lead to variations in related transmission coefficients, causing systematic errors in the reconstruction of primary cosmic ray energy and the measurement of Xmax during the maximum development of air showers. Therefore, ground-based fluorescence experiments or atmospheric Cherenkov experiments require continuous monitoring of the atmosphere. In this presentation, we will focus on the the atmospheric status over the Large High Altitude Cosmic Ray Observatory(LHAASO) , including the atmospheric layer height using microwave radiometer data on site, the monthly and diurnal variations of aerosol optical thickness and possible sources of aerosols with the solar photometer (CE318-T) data on site, monthly variations of atmospheric density profiles based on the MISISE-90 atmospheric model , and quarterly and diurnal variations of cloud occurrence rate and cloud base height utilizing lidar ceilometers on site and Fengyun-4 satellite data, CloudSat-CLIPSO satellites data.

Collaboration(s)

Author: Prof. ZHU, Fengrong (Tibet University)

Co-authors: YANG, Huimin; Mrs LIU, Jing (Southwest Jiaotong University); Mrs BAI, Nan (Southwest Jiaotong University); WANG, Zhihao (Southwest Jiaotong University)

Presenter: Prof. ZHU, Fengrong (Tibet University)

Session Classification: PO-1

Track Classification: Cosmic-Ray Indirect