

The energy spectrum of ultra-high energy cosmic rays measured at the Pierre Auger Observatory and the Telescope Array

Monday, October 3, 2022 2:10 PM (20 minutes)

In the study of cosmic rays, the measurement of the energy spectrum of the primaries is one of the main issues and provides fundamental information on the most energetic phenomena in the Universe. At ultra-high energies, beyond 10^{18} eV, the cosmic rays are studied by the two largest observatories built so far, the Pierre Auger Observatory and the Telescope Array. Both observatories are based on a hybrid design and reported a measurement of the energy spectrum using the high duty cycle of the surface detector and the calorimetric estimation of the energy scale provided by the fluorescence detector.

The differences among the reported spectra are scrutinized by a working group made by members of the Auger and Telescope Array Collaborations. The two measurements have been found well in agreement below 10^{19} eV while, at higher energies, they show an energy-dependent difference that is beyond the systematic uncertainties associated to the energy scale.

In this contribution we review the status and perspectives of the working group activities including new studies aiming at addressing the impact on the flux measurement at the highest energies of potential biases in the estimation of the shower size.

Primary author: Dr VERZI, Valerio (INFN, Roma Tor Vergata)

Presenter: Dr VERZI, Valerio (INFN, Roma Tor Vergata)