Contribution ID: **91** Type: **Talk**

Probing hadronic interaction models with IceTop and IceCube

Thursday 4 August 2022 16:00 (20 minutes)

Cosmic rays that enter the Earth's atmosphere interact with air nuclei, initiating a cascade - an air shower. The secondary particles that reach the ground can be measured with large detector arrays. Understanding the air-shower development is crucial for the interpretation of cosmic-ray observables and strongly depends on our knowledge of high-energy hadron production. During the air-shower development, hadronic cascades decay into muons in a broad range of energies. The IceCube Neutrino Observatory together with its surface array, IceTop, provide unique possibilities to detect these muons. The in-ice array of optical modules can detect air-shower muons in the TeV energy range. IceTop, an array of ice-Cherenkov tanks, measures the dominant electromagnetic component as well as GeV muons. These measurements allow us to probe hadronic multiparticle production at different stages of the air-shower development. In this contribution we will focus on the density of low-energy muons obtained with IceTop, as well as on the high-energy muon multiplicity from the in-ice data. We will show these studies for different hadronic interaction models and discuss resulting differences.

Preferred track

Cosmic Rays and Astrophysics

Subfield

HEP experiment

Attending in-person?

Yes

On behalf of collaboration?

IceCube

Primary authors: Dr LESZCZYŃSKA, Agnieszka (KIT, Karlsruhe); SOLDIN, Dennis (University of Wuppertal); SOLDIN, Dennis; VERPOEST, Stef; VERPOEST, Stef; VERPOEST, Stef (Ghent University)

Presenter: Dr LESZCZYŃSKA, Agnieszka (KIT, Karlsruhe)

Session Classification: Cosmic-ray and astrophysics 1

Track Classification: Cosmic ray and astrophysics