Contribution ID: **291** Type: **Poster**

Improving the description of atmospheric muons in KM3NeT data using the Daemonflux data-driven model

The Cubic Kilometre Neutrino Telescope - KM3NeT - is subject to an intense flux of atmospheric muons, even at the bottom of the Mediterranean Sea. These atmospheric muons are created by the collisions of cosmic rays with nuclei of the upper atmosphere and their subsequent interactions, and as such, serve as probes of cosmic ray physics. The KM3NeT/ARCA and KM3NeT/ORCA detectors are located offshore Portopalo di Capo Passero, Italy, and Toulon, France, respectively, at corresponding depths of 3.5 km and 2.45 km below sea level. They offer the unique ability to detect atmospheric muons at two different locations and depths, as part of the same research infrastructure. The KM3NeT Collaboration has presented results comparing the flux of atmospheric muons in the detector with CORSIKA simulations, and - by showing an underestimation of the muon data by the simulation - is contributing to the global phenomenon known as the Muon Puzzle. A data-driven model Daemonflux has recently appeared on the scene and shows promise of alleviating this discrepancy. In this study, Daemonflux is incorporated into the atmospheric muon simulation used to describe KM3NeT data, and its impact in doing so is estimated. We also evaluate the impact of the optical properties of the seawater on the agreement between the KM3NeT data and the atmospheric muon simulation.

Collaboration(s)

KM3NeT Collaboration

Authors: Dr Ó FEARRAIGH, Brían (INFN University of Genoa); ELLAJOSYULA, Venugopal

Co-authors: ROMANOV, Andrey (LPC-Caen); Dr KULIKOVSKIY, Vladimir (INFN Genova); BADARACCO, Francesca

Presenter: Dr Ó FEARRAIGH, Brían (INFN University of Genoa)

Session Classification: PO-1

Track Classification: Cosmic-Ray Indirect