



Contribution ID: 129

Type: **not specified**

The cosmic-ray electron spectrum measured with the MAGIC telescopes

Monday, 11 September 2023 15:20 (15 minutes)

Cosmic-ray electrons and positrons (CREs) of TeV energies suffer severe energy losses during their propagation limiting their traveling distances to just a few kpc and, therefore, their measurement provides a unique channel to constrain local Galactic cosmic-ray sources. However, at high energies their detection is intrinsically difficult due to their low abundances and steep spectrum. In this context, ground-based imaging atmospheric Cherenkov telescopes (IACTs), such as MAGIC, can profit from their large collection areas to perform studies of CREs at energies where space-borne detectors are less sensitive. In this presentation, we will present two methods - a template fit method and a tight cut method - designed to detect and study CREs with IACTs. We will then apply these methods on data collected by the MAGIC telescopes to measure the energy spectrum of CREs between 300 GeV and 7 TeV. Additionally, we will provide a detailed analysis of the systematic errors that may affect this measurement.

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Session Classification: CCR: Charged Cosmic Ray

Track Classification: Charged Cosmic Rays