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Hadron Collider Measurements for IACT Background Modeling

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Ground based gamma ray measurements with IACTs suffer from irreducible backgrounds from a specific type of cosmic-ray induced air showers. These air showers are characterized by a large electromagnetic component which is mostly due to highly energetic neutral pions produced in the primary interaction of cosmic rays with atmospheric nuclei. Current event generators that model these hadronic interactions show significant discrepancies in their predictions, especially for high energetic pion production, which translate into the dominant source of systematic uncertainties for gamma-ray analyses. In this talk, we identify regions of phase space in which current collider experiments, such as LHCf and RHICf, are sensitive to these processes. The corresponding measurements should lead to significant improvement of hadronic interaction modeling in general and reduce the systematic uncertainties for gamma-ray astronomy with IACTs.

Collaboration(s)

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