Contribution ID: **109** Type: **Oral presentation**

Separation of Electron, Proton and Gamma-ray induced Air Showers with Imaging Atmospheric Cherenkov Telescopes

Monday, 26 October 2015 18:13 (15 minutes)

Ground-based gamma-ray astronomy is still tackling a major problem: background. Reconstruction techniques exist to distinguish most of the background of hadrons but an irreducible background of electrons and gamma-like protons still remain. I present here a new technique making use of direct Cherenkov light and air shower development that provides a way to efficiently distinguish between electrons and gamma-rays for the first time. In addition to this, the remaining proton background can also be identified. This analysis increases the sensitivity of Imaging Atmospheric Cherenkov Telescopes and allows an improved measurement of the cosmic electron spectrum. I also discuss further applications of this approach to the studies on diffuse emissions, extended sources and cosmic ray composition.

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Session Classification: Gamma-Ray Astrophysics

Track Classification: Gamma-ray Astrophysics