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The background from single π^0 events in the IACT observations

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A system of Imaging Air Cherenkov Telescopes (IACTs) can be triggered by hadronic events containing Cherenkov light from at most two electromagnetic subcascades, which are products of the single π^0 decay. The recorded images of those showers have a similar shape to the primary γ -ray events. Therefore, they are hardly reducible background for observations using IACTs.

In this paper, the impact of the single π^0 events on the efficiency of the γ /hadron separation was studied using the Monte Carlo simulations. The fractions of events containing the light from single π^0 in the expected total protonic background depends on the trigger threshold, reflector area and altitude of the observatory. The calculated quality factors are correlated with the contributions of single π^0 events in the proton initiated showers with primary energies below 200 GeV. The occurrence of the single π^0 images is one of the main reasons for the deterioration of the γ /hadron separation efficiency at low energy.

Collaboration

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Primary author: SOBCZYNSKA, Dorota (University of Lodz)**Presenter:** SOBCZYNSKA, Dorota (University of Lodz)**Session Classification:** Poster 2 GA**Track Classification:** GA-IN