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Performance of the MAGIC telescopes under moonlight

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MAGIC is a system of two 17m diameter Imaging Atmospheric Cherenkov Telescopes (IACT) located at the Observatorio del Roque de los Muchachos in the Canary island of La Palma. It observes the gamma-ray sky from ˜50 GeV to more than 50 TeV. The IACT technique works preferentially in very dark condition. The best performance and lowest energy threshold are reached at dark astrophysical sites during moonless nights. However, the MAGIC telescopes have been designed to operate also with brighter Night Sky Background (NSB) light than dark nights. They can observe during twilight and moonlit nights. This allows us to increase the available observation time per year by about 50%. Here, we report about the performance of the MAGIC telescopes during moonlit nights based on observations of the Crab Nebula. Data analysis and Monte Carlo simulations must be adapted to the higher noise level induced by the moonlight. While the energy threshold depends dramatically on the NSB level, we show that other performance characteristics, such as the sensitivity, do not degrade significantly.

Collaboration

MAGIC

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206

Author: COLIN, Pierre (MPI fuer Physik)

Co-authors: GUBERMANN, Daniel (IFAE); STRZYS, Marcel (MPI fuer Physik); BLANCH BIGAS, Oscar (Instituto de Fisica de Altas Energias (IFAE)); ZANIN, Roberta (U)

Presenter: COLIN, Pierre (MPI fuer Physik)

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