

Seminar na doktorskom studiju Fizika

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Influence of the atmospheric conditions on characterisation of active galactic nuclei observed with Cherenkov telescopes

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Abstract

In a wide range of high-energy sources observed by MAGIC telescopes, active galactic nuclei (AGNs) are of particular interest for study, for such objects are the most luminous detected sources of electromagnetic radiation in the universe. Recent observations with MAGIC telescopes have detected flares from AGNs B2 1811+31 and GB6 J1058+2817 in very-high-energy (VHE) gamma range. Such and similar detections were performed by observing the interaction of the primary gamma-ray with the molecules of the upper atmosphere producing an avalanche of secondary particles, called electromagnetic showers. Different atmospheric conditions, such as clouds, sand and aerosols, can reduce the fraction of Cherenkov photons produced in atmospheric air showers that reach ground-based telescopes, which may affect the measured spectral characteristics of observed sources. The characterisation of two recently detected VHE sources using data from the MAGIC telescopes and other telescopes distributed along the entire electromagnetic spectrum will be discussed, as well as the analysis of atmospheric properties above MAGIC telescopes and their effects on the study of VHE gamma-ray sources.