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Extragalactic Background Light, Hubble constant and Intergalactic Magnetic Fields with Imaging Atmospheric Cherenkov Telescopes: status and perspectives

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Imaging Atmospheric Cherenkov Telescopes measure cosmic gamma radiation at very-high-energies (VHE) between 20 GeV and about 100 TeV. While most of the observations are devoted to study astrophysical processes in the sources of the gamma-ray emission (Supernova remnants, pulsar wind nebulae, gamma-ray binaries, active galactic nuclei, gamma ray bursts etc), distant gamma rays can also be used to test cosmological models. In particular, the cosmic background low-energy photon field (called Extragalactic Background Light, EBL) is causing energy dependent absorption feature in the observed spectra of VHE gamma-ray sources. Alternatively, if the density of the EBL is known, the absorption feature can be used to determine the Hubble constant H_0 . Moreover, measured temporal and spatial emission recorded from distant blazars is sensitive to intergalactic magnetic fields in the voids. In this presentation I explain the technique used, the results obtained so far and give an outlook to the future prospects.

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