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Constraints on Extragalactic Background Light using very high energy gamma rays

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Very high energy (VHE, E > 30 GeV) gamma-rays are absorbed via interaction with low-energy photons from the extragalactic background light (EBL) if the involved photon energies are above the threshold for electron-positron pair creation. The VHE gamma-ray absorption, which is energy dependent and increases strongly with redshift, distorts the VHE energy spectra observed from distant objects. The observed energy spectra of the AGNs carry, therefore, an imprint of the EBL. The detection of hard VHE gamma-ray spectra of distant sources (z = 0.11 - 0.54) by H.E.S.S. and MAGIC enabled to set strong upper limits on the EBL density, using certain basic assumptions about blazar physics. These assumptions are, however, under discussion.
In this talk, we give an overview of the EBL constraints, their limitations and perspectives for the joint efforts of the Fermi Gamma-Ray Space telescope, current imaging atmospheric Cherenkov telescopes and future projects like the Cherenkov Telescope Array (CTA).

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