

Modification of the gamma-ray spectra from active galaxies by soft radiation of transiting luminous stars

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Gamma-ray emission in active galaxies is expected to originate in a close proximity of the supermassive black hole surrounded by a rich cluster of luminous stars. We consider the effects of luminous stars (early type of red supergiant, separate or in binary systems) crossing accidentally the gamma-ray beam close to the observer's line of sight. We show that soft radiation of massive stars can create enough target for transient absorption of the gamma rays in multi-GeV to TeV energy range. We predict characteristic, time-dependent effects on the gamma-ray spectra due to the encounter with stars. As an example, we consider such effects on the spectra observed from a typical blazar, 1ES 1959+650 (in an active state) and also in the case of a radio galaxy M87 (in a low state). Observation of such transient characteristic features in the gamma-ray spectra of blazars and radio galaxies lays within the sensitivity of the future Cherenkov Telescope Array.

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