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Effects of emission by electron-positron pairs from gamma-ray absorption in the BLR of gamma-ray blazars on the broadband SED

Blazars are a class of active galactic nuclei. These objects are bright sources of radiation throughout the entire electromagnetic spectrum. The spectral energy distributions (SEDs) of some blazars have a distinct dip feature occurring in the gamma-ray energy band of 10 - 200 GeV. We have investigated this feature in the known bright blazar 3C 279 by analysing its spectrum in earlier work. Results from this analysis suggest that the optical-ultraviolet emission lines of the broad-line region (BLR) of 3C 279 contribute to the absorption of gamma rays in the observed dip energy range. We have also calculated the synchrotron self-Compton (SSC) emission from secondary electron-positron pairs from absorbed gamma rays. We find that if the magnetic field inside the jet is sufficiently high, SSC emission from the pairs has the effect of filling the SED dip. Subsequently, we derive an upper limit on the jet magnetic field.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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