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Study of Electric Current Induced by the deflection of Blazar-induced TeV Pairs in a Homogenous IGMF

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The Relativistic electron-positron pairs produced by high energy gamma rays (more than TeV) can produce about GeV cascade gamma rays via Inverse Compton Scattering. The produced $+e/-e$ and the cascade gamma ray had been found to be absent in the gamma ray spectra of several Blazars. This absence is due to the deflection of the motion of the charged particles due to the existence of the intergalactic magnetic field (IGMF). In this paper, the $+e/-e$ pairs production rates for the Blazar 1ES 0229+200 had been used to find the electric currents induced by the deflection of pairs in a homogenous background magnetic field. The calculations were performed for pairs produced starting from distance 50 Mpc away from the source including their cooling via Inverse Compton Scattering while they travel a distance of 1 Mpc. Then the magnetic field induced by the electric current had been evaluated to be compared with the background magnetic field.

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