

ABSTRACT

A REVIEW OF THE CURRENT STATE OF
RESEARCH ON EXTRAGALACTIC SOURCES
THAT EMIT GAMMA RAYS IN THE TEV
RANGE, USING THE CHERENKOV
TECHNIQUE.
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Gamma rays are a form of high-energy electromagnetic radiation that is unaffected by galactic magnetic fields. Although the study and detection of gamma-ray emissions, both from satellites and terrestrial sources, have experienced significant advances throughout history, starting with the installation of the MIT gamma-ray instrument in the 1960s, we will focus on the sensitivity of the Cherenkov atmospheric technique. Extensive air showers result from collisions between photons and protons. The total cross-section of these collisions has measured center-of-mass energies up to 200 GeV. The predominant interactions are electromagnetic, with cross-sections for the production of hadron and muon pairs much smaller than those for electron pairs. In this electromagnetic cascade, photons generate electron-positron pairs, and electrons and positrons generate photons through bremsstrahlung, exponentially increasing as it propagates through the atmosphere, dividing the primary energy among more and more particles. However, as the energy decreases, the ionization energy loss mechanism becomes more important than bremsstrahlung.

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