

BEHAVIOR OF INDIVIDUAL ELECTROMAGNETIC CASCADE SHOWER WITH THE LPM EFFECT IN GEOMAGNETIC FIELD

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It should be emphasized that the electromagnetic cascade showers with the LPM effect (the LPM showers) are too much affected due to strong in the cross sections for bremsstrahlung and pair production processes so that the individual LPM shower shows too wide variety over its development, as its primary energy increases. On the other hand, the extremely high energy gamma-rays, outside the Earth, say, above 10^{19} eV, if they really exist, produce electrons and photons due to the magnetic bremsstrahlung and magnetic pair production due to the Earth magnetic field before their reaching the atmosphere of the Earth, which makes the LPM effect weaken. We calculate the LPM shower both with and without the Earth magnetic field, and examine the Earth Magnetic field effect over the LPM shower.