



Search for Terrestrial Electron Beams (TEBs) in SAMPEX data

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SAMPEX was a low polar orbiting satellite operating from 1992 to 2012. Our goal is to detect Terrestrial Electron Beams (TEBs) with the HILT instrument on SAMPEX. After 1996 this instrument was switched to a mode where electrons in excess of 1 MeV were detectable, with a time resolution of 20 ms. TEBs are secondary electrons generated by Terrestrial Gamma-ray Flashes (TGFs), due to Compton scattering and pair-production. These electrons are gyrating along geomagnetic field lines out to space. The point of interest is where the actual magnetic field line intersects the SAMPEX orbit. If we assume that the background radiation is Poisson distributed, we have found a lot of peaks that is significant above this background rate. To see if these candidates are correlated to lightning activity, we have to trace the geomagnetic field line down to an altitude of about 45 km and see if WWLLN has detected lightning activity in one of the two foot point areas. In the end a null-hypothesis, that is looking for lightning corresponding to SAMPEX positions at arbitrary moments, has to be done to see if our candidates are correlated to lightning activity or not.