Classification of Terrestrial Electron Beams using Mirrored Pulses

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Terrestrial Electron Beams (TEBs) are the charged particle form of Terrestrial Gamma-ray Flashes (TGFs). GBM events are classified as TEBs on the weight of evidence: lightning activity (nadir versus magnetic footprints), 511 keV lines, and duration. Another criteria for TEBs is the presence of a mirror pulse. We present eight potential TEBs from Fermi GBM data with ~1 ms duration where such data is inconclusive. These eight events are selected such that Fermi was located close to the weaker magnetic footprint. This criteria implies that if the event is a TEB there should be a long delay between initial and mirror pulse. We model the expected delay of a mirrored pulse in order to better detect the mirrored pulses. If the pulse is present, it is then classified as a TEB.