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Poster
Electron microbursts are rapid, fluctuating precipitation of energetic electrons with timescales of about 100 ms. The energy of precipitating electrons ranges from tens of keV to several MeV. Collisions between these energetic electrons and the neutral atmosphere create Bremsstrahlung X-rays, which can subsequently be observed by balloons at lower altitudes. In this study, we utilize observations from the Balloon Array for Radiation Belt Relativistic Electron Losses (BARREL), where microbursts are observed with bursty and smooth components. The bursty components exhibit much higher count rates and shorter durations than the smooth components. Using test particle simulations, we show that the bursty components are directly driven by resonant interactions with discrete chorus wave elements, while the smooth components are prolonged precipitation due to atmospheric backscattering. We further demonstrate that observations by BARREL can be used as a low-altitude proxy to quantify the atmospheric backscattering ratio. Our results provide insights into the interpretation of microburst observations and are crucial for quantifying radiation belt dynamics using low-altitude observations.

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