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Radiation Belt Loss Derived from Measurements of the Total Radiation Belt Electron Content

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The Total Radiation Belt Electron Content (TRBEC) is a measure of the global number of electrons that occupy the radiation belts. It can be calculated based on electron flux measurements and provides a simple, global assessment of the radiation belts. When expressed in adiabatic coordinates, the TRBEC increases abruptly during storms and then decreases with a repeatable and consistent exponential decay during quiet periods as the particles are scattered into the atmosphere. Based on TRBEC measurements from the entire Van Allen probes mission, we quantify the global loss rate of electrons during non-storm periods and compare our results with atmospheric precipitation models.

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