



Unravelling the Complexities of the Earth's Radiation Belts: Findings from the Van Allen Probes mission

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Within the first year of Van Allen Probe operations, team members made a series of highly publicized decisive discoveries concerning the structure and evolution of the Earth's radiation belts, the processes that energize particles there, and the locations where they operate. Nevertheless, much more extensive and less publicized findings from the Van Allen Probes suggest that Earth's radiation belts regions remain a highly complex and puzzling place. Although the relation between magnetic storm and radiation belt enhancements and loss has been emphasized, dynamics during non-storm periods has occasionally been shown to be dramatic. While emphasis has been placed on new findings regarding local non-adiabatic energization mechanisms, adiabatic mechanisms have also been shown to be important. Furthermore, the interplay between, and relative importance of, these and other energization processes remain uncertain. The role of seed populations has been highlighted, with some studies pointing to localized mechanisms and others pointing to the role of substorms in transporting and injecting such populations. Here we review some of the less publicized findings and future objectives of the Van Allen Probes mission to get a broader and in-depth view of present understanding of Earth's inner magnetosphere.