



Inner Belt & Slot Region Electron Losses due to Lightning-generated Whistlers and VLF Transmitter Signals

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The relative roles of different types of whistler-mode waves in the loss of energetic electrons from the inner belt & slot regions have been the source of debate for some time, with naturally generated plasmaspheric hiss, lightning-generated whistlers, and VLF transmitter signals all believed to be contributing in different but possibly overlapping regions. The development of our understanding of the loss dynamics of these highly stable radiation belt regions has been limited by both the availability of quantitative models and (especially earlier) quantitative data on the different types of waves. Arguably one of the most important and comprehensive studies have been put forth by Abel & Thorne [1998], but the conclusions of this study is also subject to many assumptions about the nature, extent, and variability of the driving waves. Quantitative determination of the loss dynamics of the inner belt & slot regions is arguably more important/difficult than that of the outer belt where the electron lifetimes are naturally low, and where the loss and acceleration processes have to be considered together. In this paper, we provide a brief summary of the development of our understanding over the last two decades, and discuss recent measurements (ground- and satellite-based) and modeling work.