

RECENT RESULTS ON EFFECTS OF LIGHTNING DISCHARGES ON THE IONOSPHERE AND THE RADIATION BELTS

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Abstract

Lightning discharges release tremendous amount of energy (up to 10^9 Joules) and occur much more frequently than is commonly realized (2000 thunderstorms active at any time with 40-100 flashes per second globally). While the significance of the physical effects of these discharges on the ionosphere and the radiation belt has long been debated, phenomena such as Lightning-induced Electron Precipitation (LEP), Transient Luminous Events (TLEs) and Terrestrial Gamma Ray Flashes (TGFs) continue to attract attention. In this paper, we review advances in our understanding of these phenomena realized during the last triennium and also discuss opportunities for even more significant advances presented by several upcoming international space missions to be realized in the next triennium.