Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Observed Local and Conjugate Ionospheric Disturbances from Rare High Peak Current Oceanic Lightning Events[1] NICHOLAS GROSS, MARK GOLKOWSKI, LEVON BARSIKYAN, University of Colorado Denver, ROBERT MOORE, University of Florida — Using VLF remote sensing, we present a rare event in which three distinct and geographically separated ionospheric disturbances, all caused by a single, large (388 kA), positive polarity cloud to ground oceanic lightning discharge. The disturbances include a so-called Early/Fast event caused by a quasi-electrostatic field, along with both a northern and southern hemisphere lightning-induced electron precipitation (LEP) event. The LEP mechanism is driven by cyclotron resonant interactions between the lightning induced whistler waves and radiation belt electrons. Using data from the new GLD360 lightning detection network, we model the electron precipitation characteristics for both hemispheres. Modeling is performed by using the spectral content of the lightning strike to determine the magnetospheric whistler induced particle precipitation, then an atmospheric backscattering model is implemented to account for the geographic dependence of the equatorial loss cone angle. Our findings indicate that future works involving VLF remote sensing need to take into account these multifaceted processes and their unique signatures.

[1]This work is supported by DARPA grant HR0011-10-1-0061 with subaward UF-EIES-1005017-UCD to CU Denver

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Date submitted: 12 Jul 2013 Electronic form version 1.4