Recent Ohio University LORAN-C Atmospheric-Noise Flight-Test Results

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Current Efforts

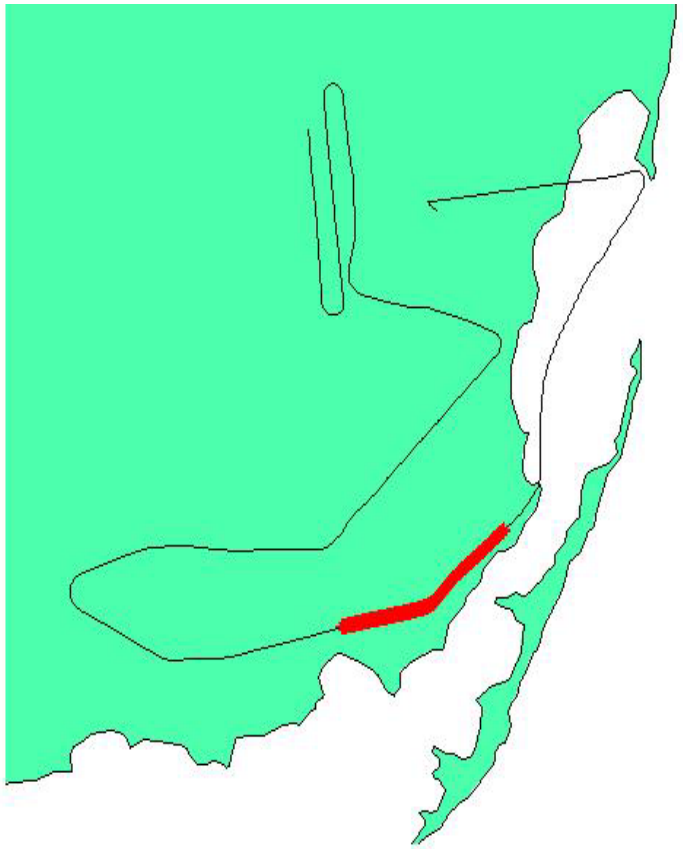
- DC-3 Instrumentation
  - Field Mill
  - Instrumented static dischargers
  - Reelektonika DataGrabbers
- Rubidium Clock
  - Rubidium clock added to increase DataGrabber timing stability
  - GPS and LORAN files now time-synchronized
- Flight Testing
  - TMB July 2006
  - Thunderstorm and p-static noise

DC-3 Instrumentation

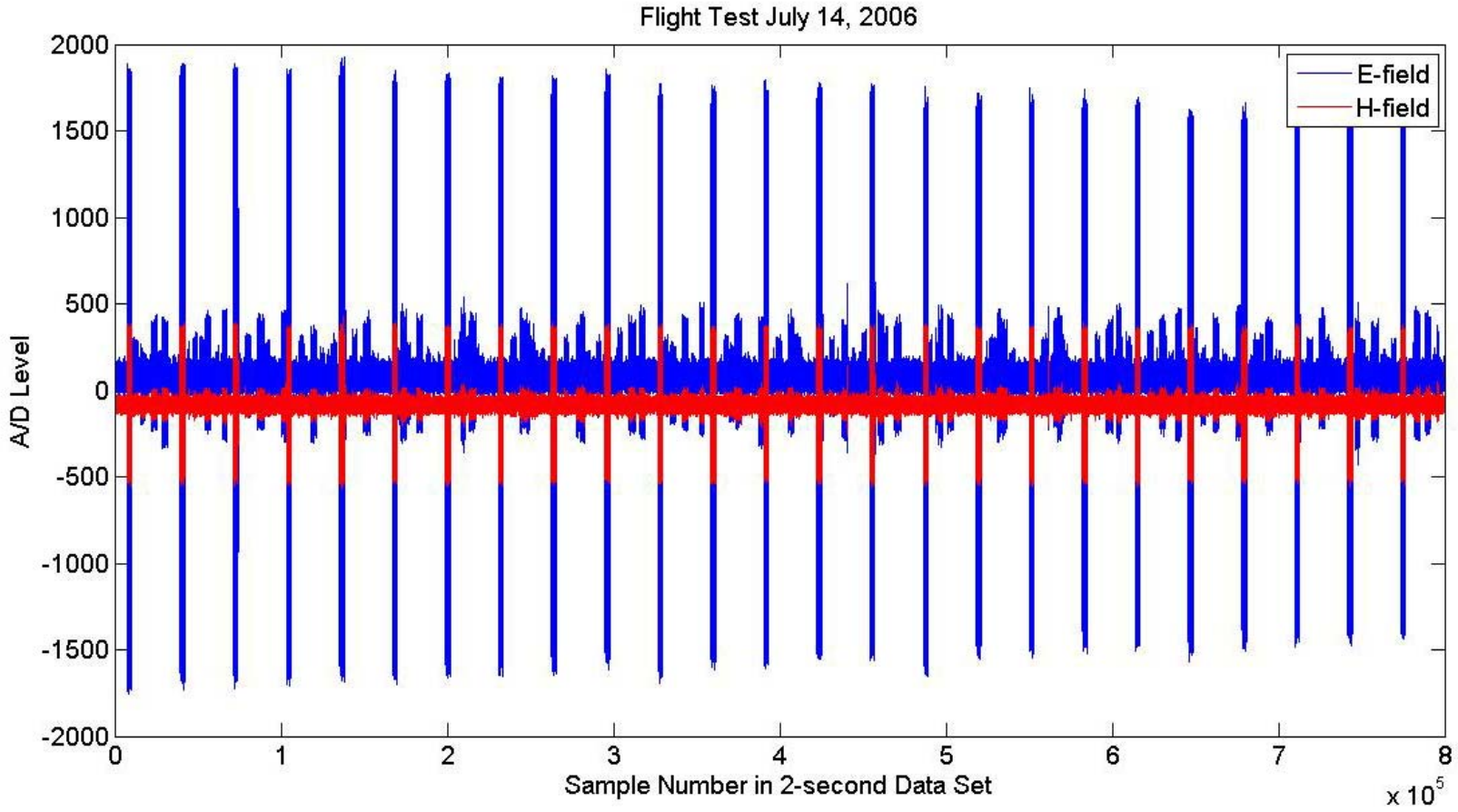
TMB Flight Test July 2006

- Why Tamiami?
  - Frequent, isolated t-storms
  - Comparison to July 2004 King Air data
  - Less cross-rate interference
- Flight test
  - Testing conducted over a two-week period
  - Ground data also collected
  - Stanford collected data during several flights

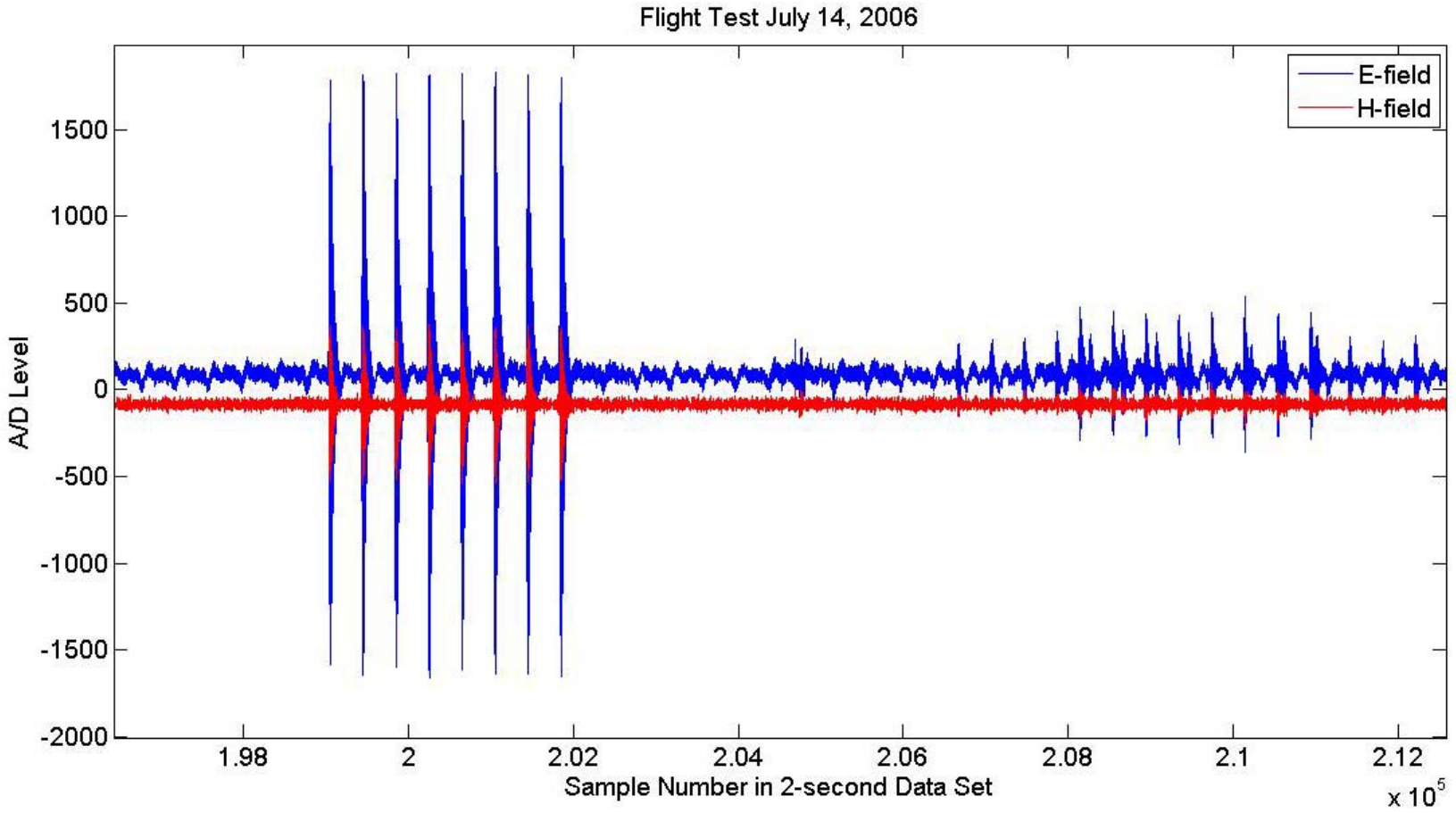
July 14, 2006 – Clear (1 of 6)



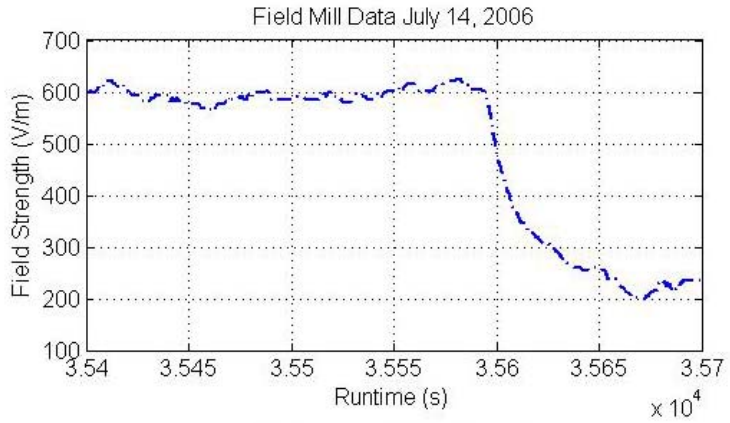
July 14, 2006 – Clear (2 of 6)

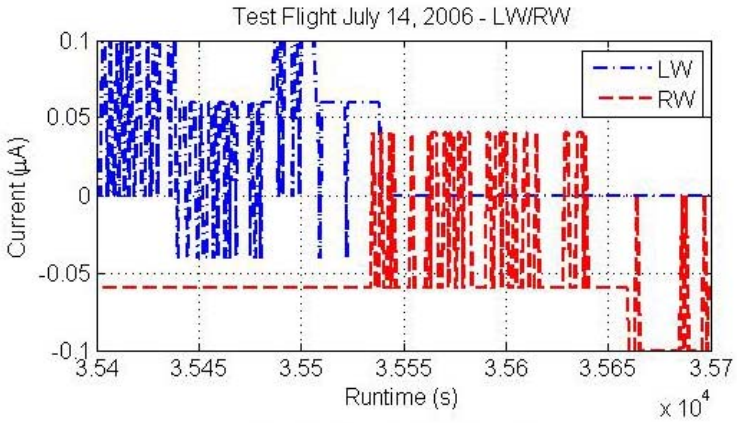


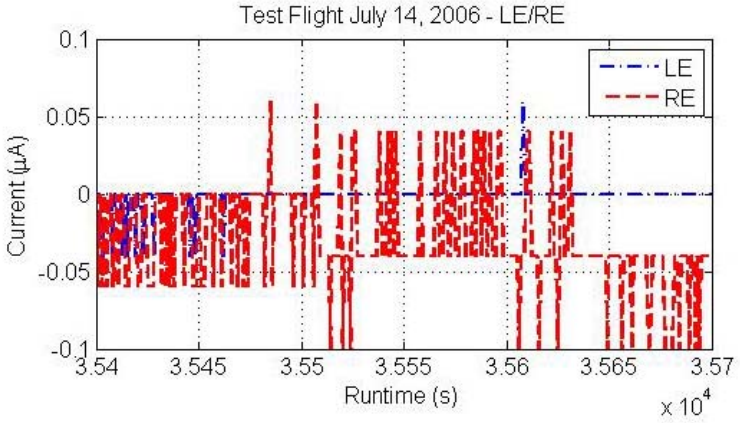
July 14, 2006 – Clear (3 of 6)

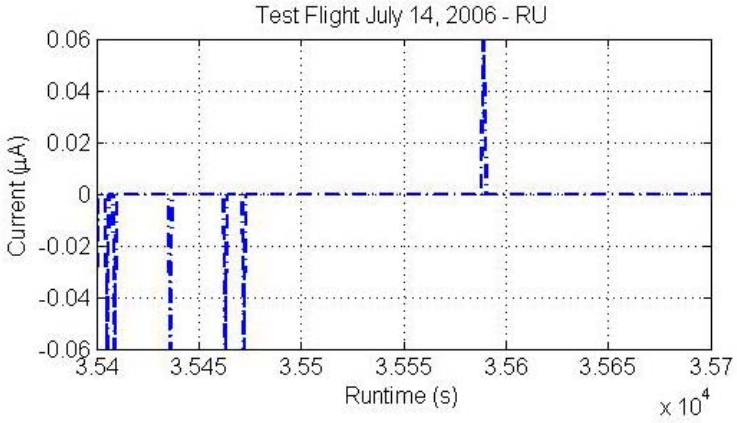


July 14, 2006 – Clear (4 of 6)

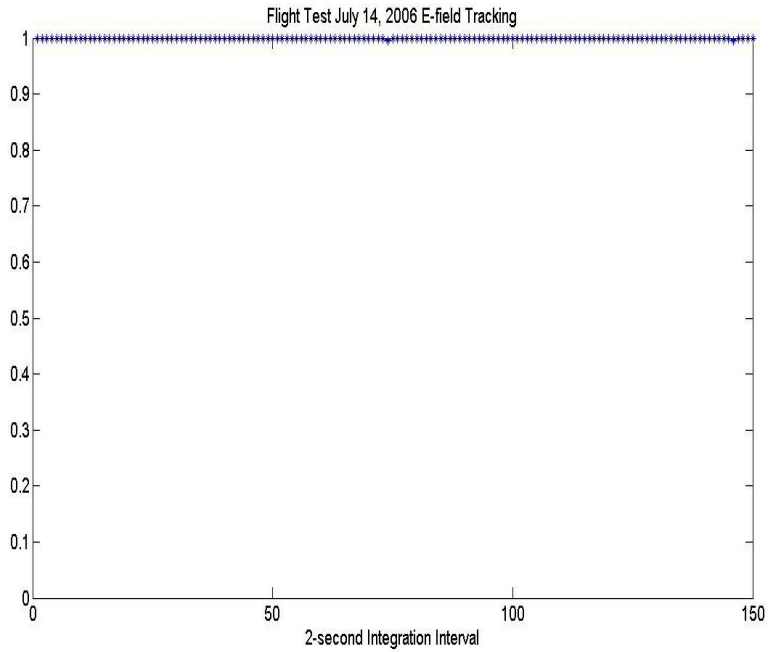


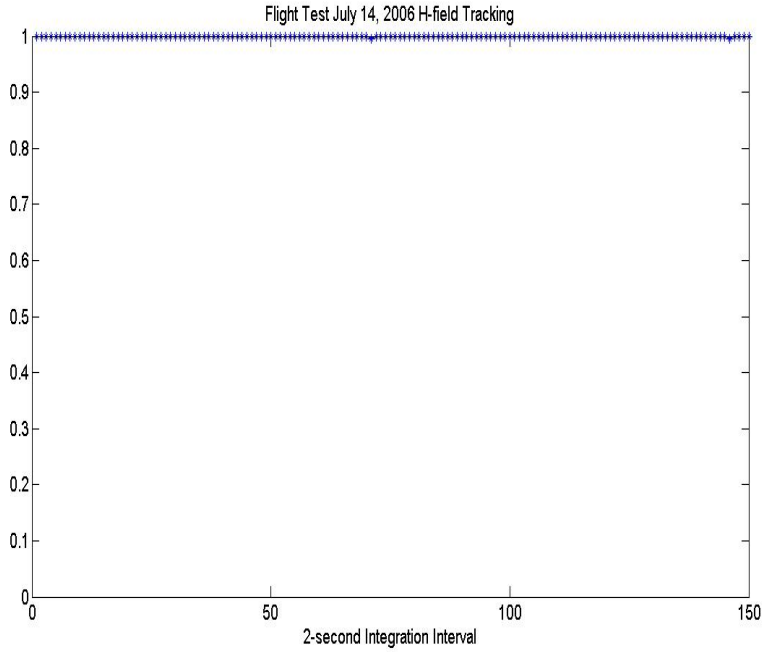




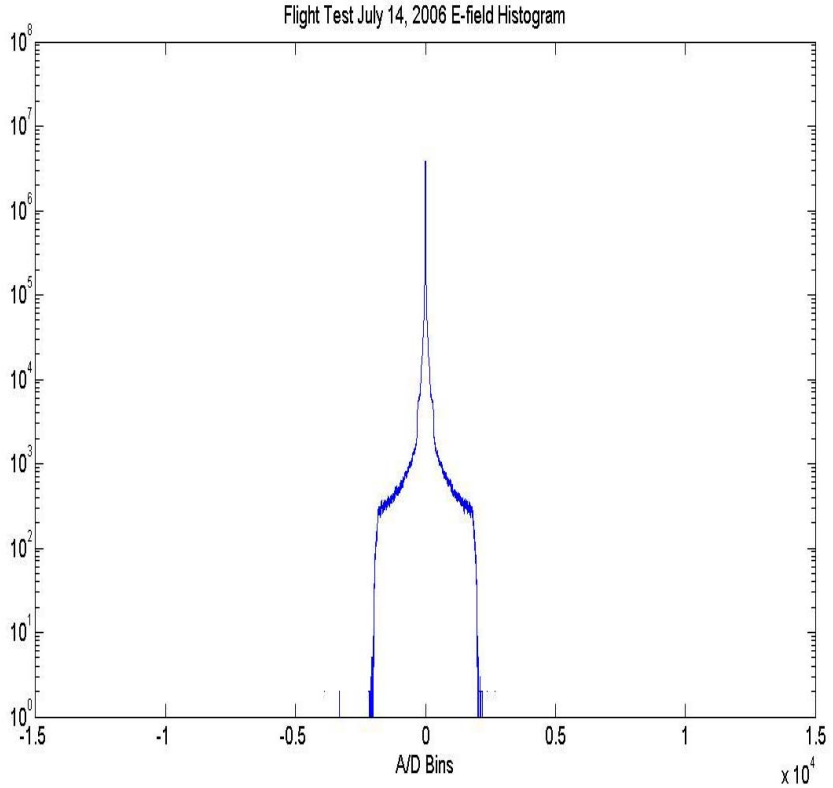


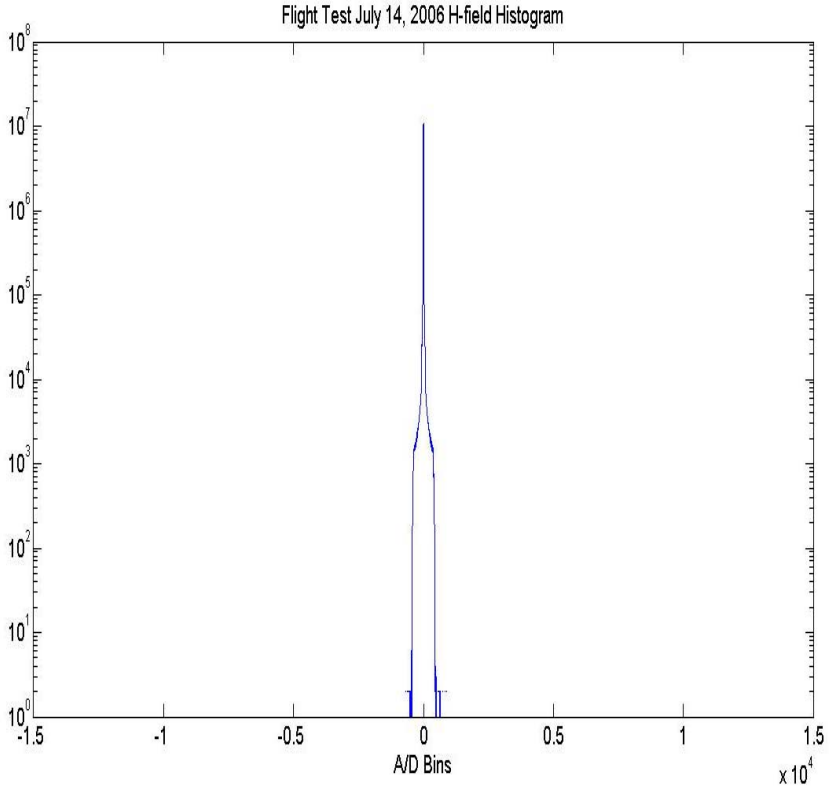
July 14, 2006 – Clear (5 of 6)



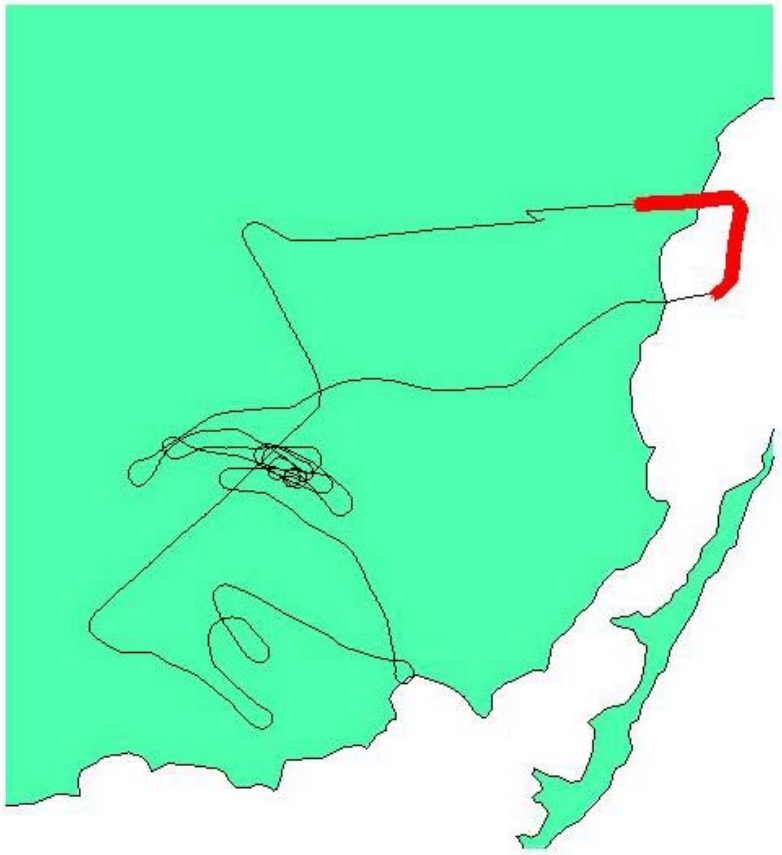


July 14, 2006 – Clear (6 of 6)

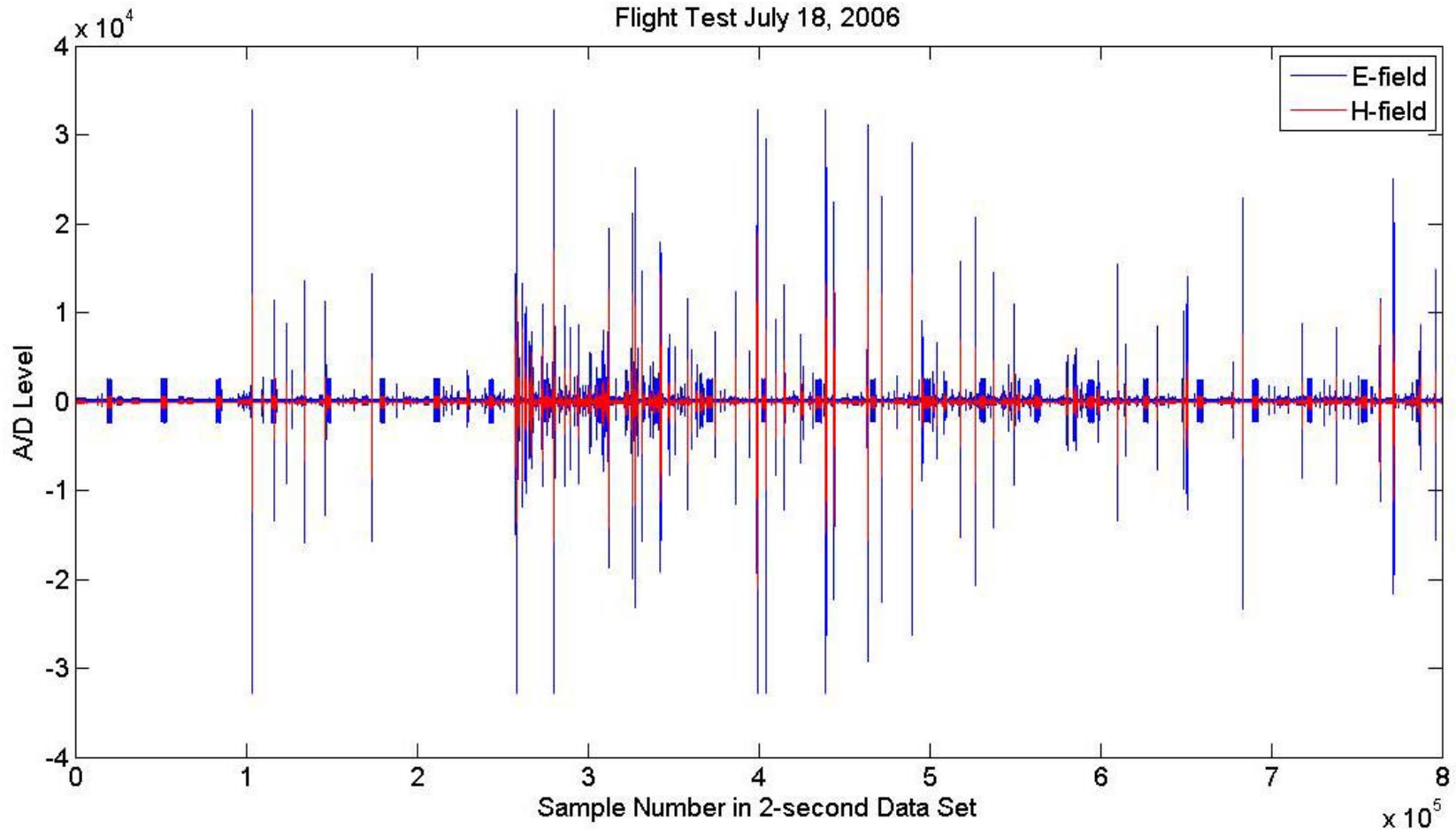




July 18, 2006 – Lightning (1 of 6)



July 18, 2006 – Lightning (2 of 6)



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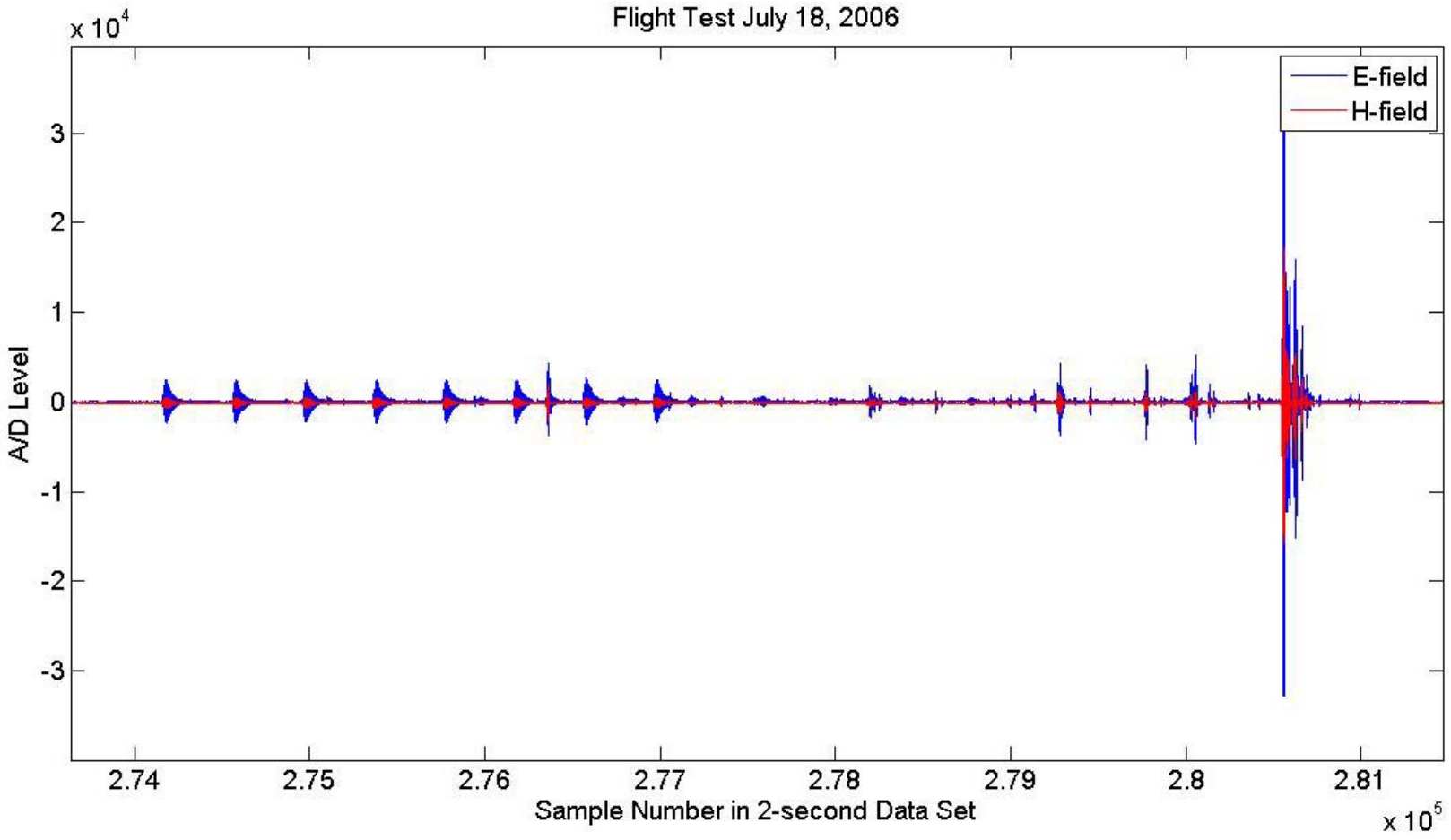
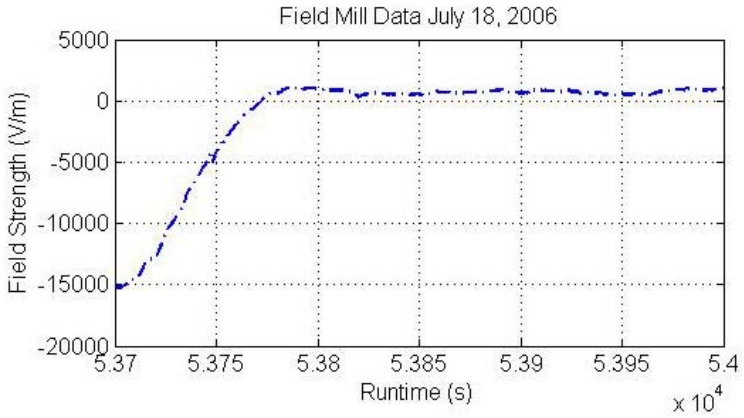
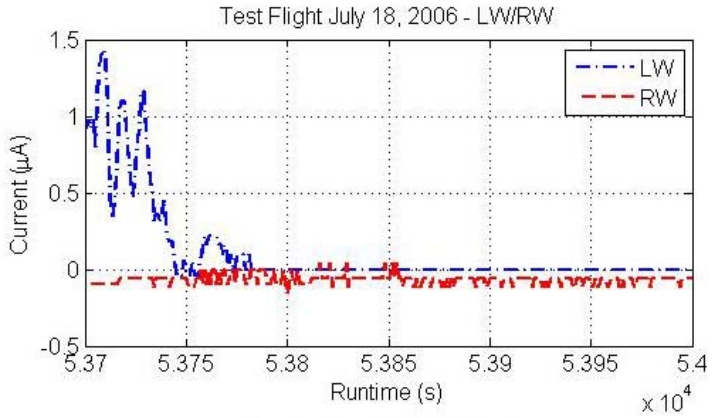
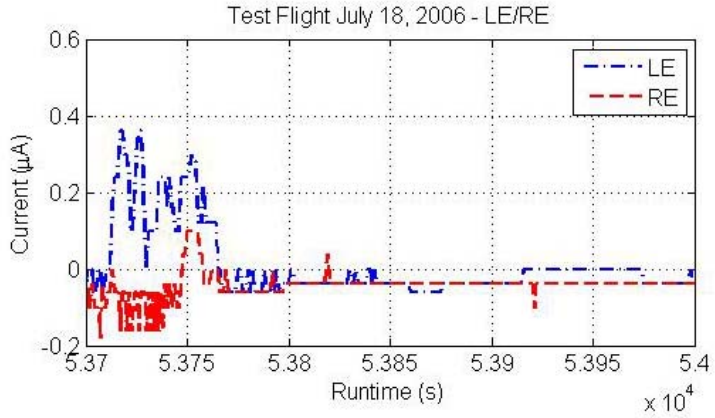
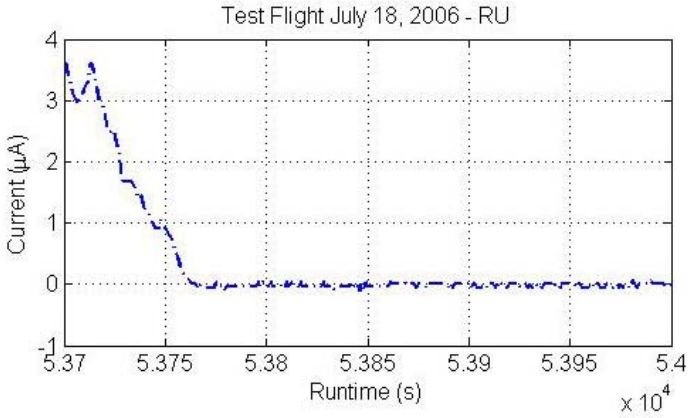


July 18, 2006 – Lightning (4 of 6)

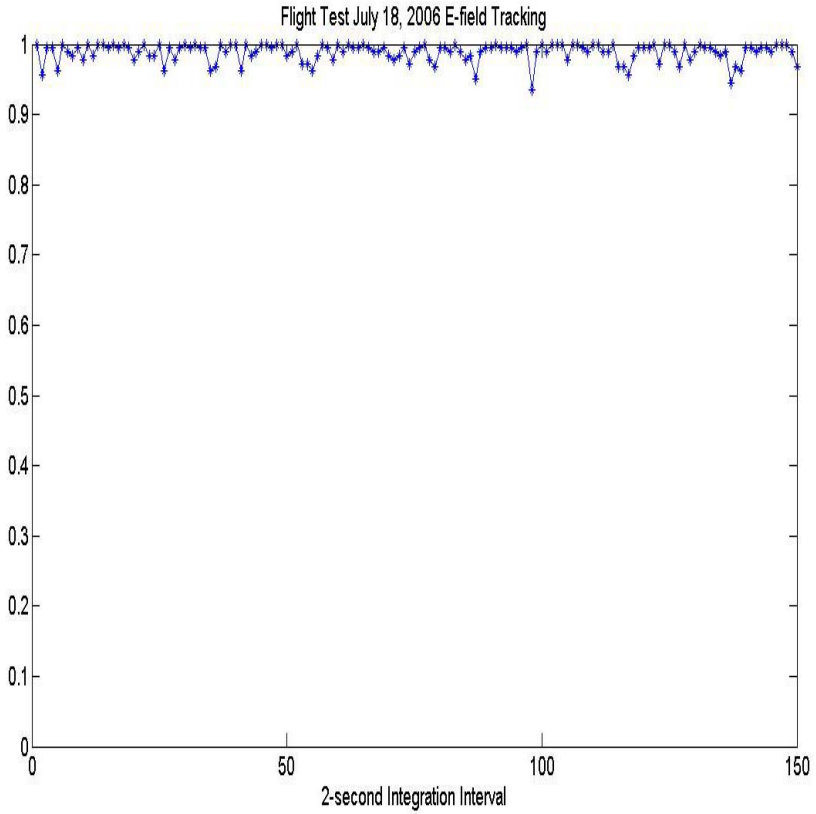


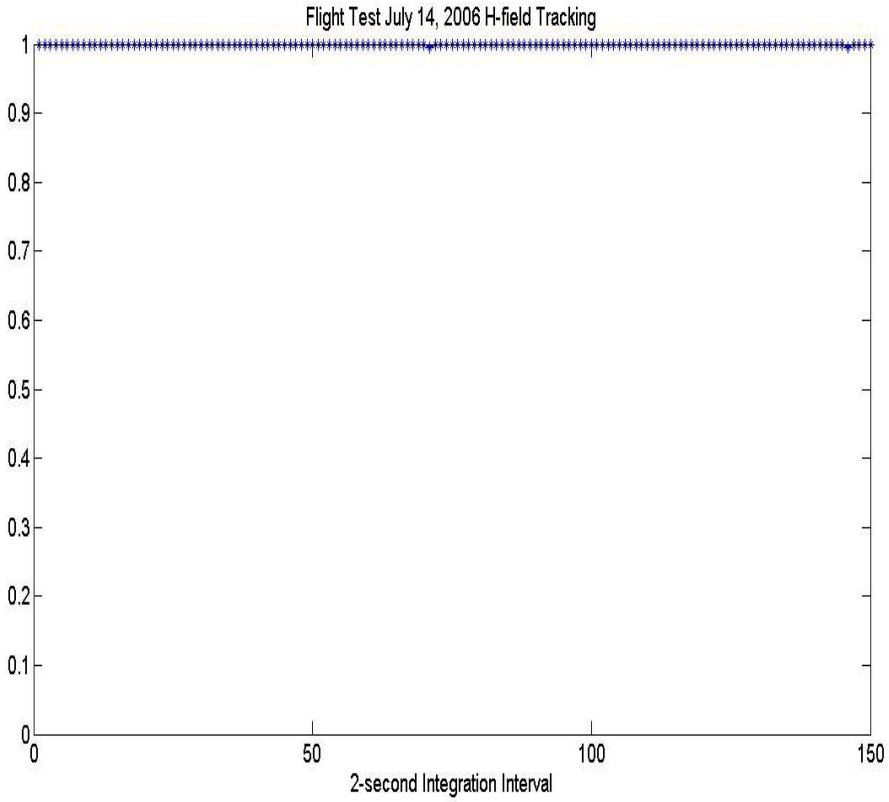






July 18, 2006 – Lightning (5 of 6)





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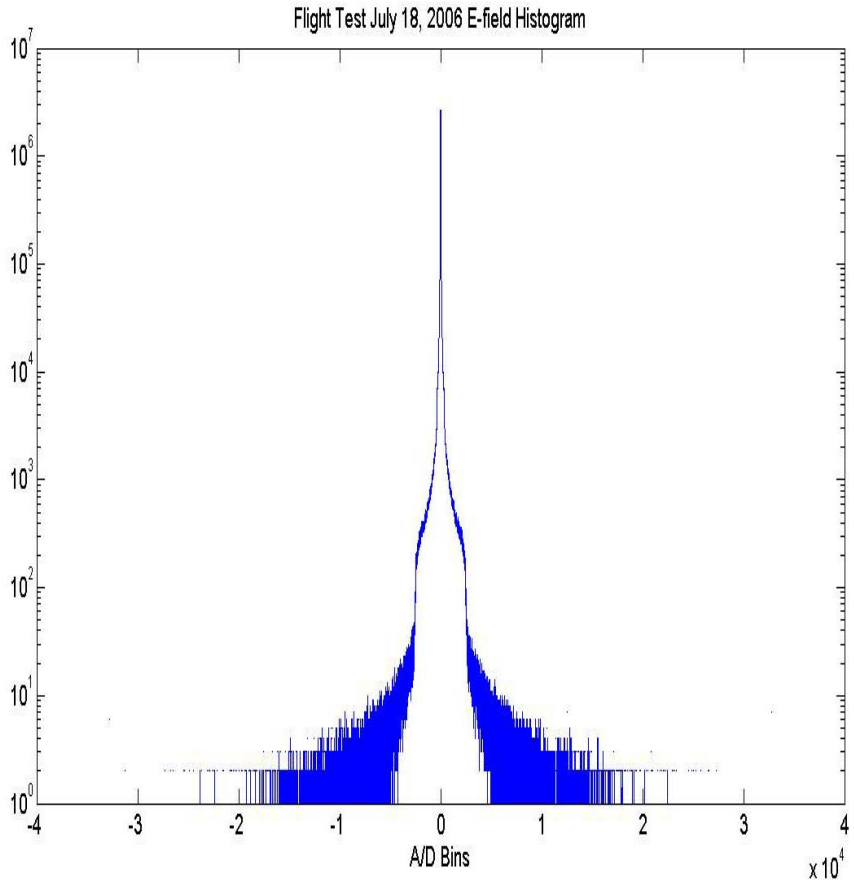
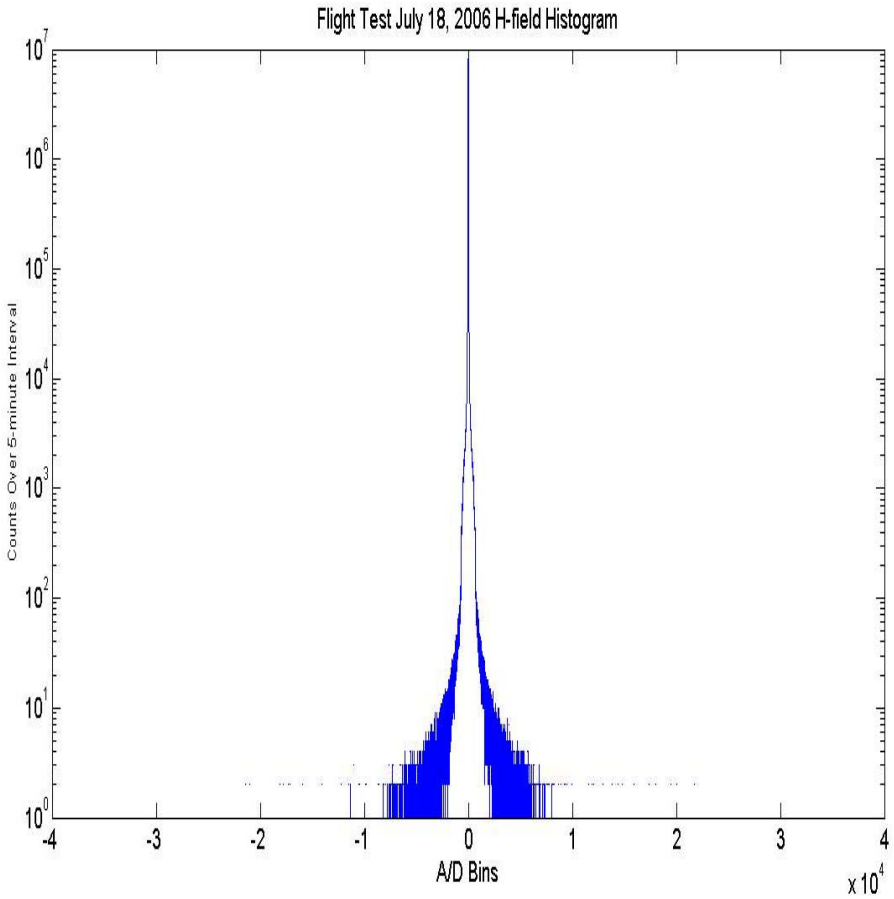
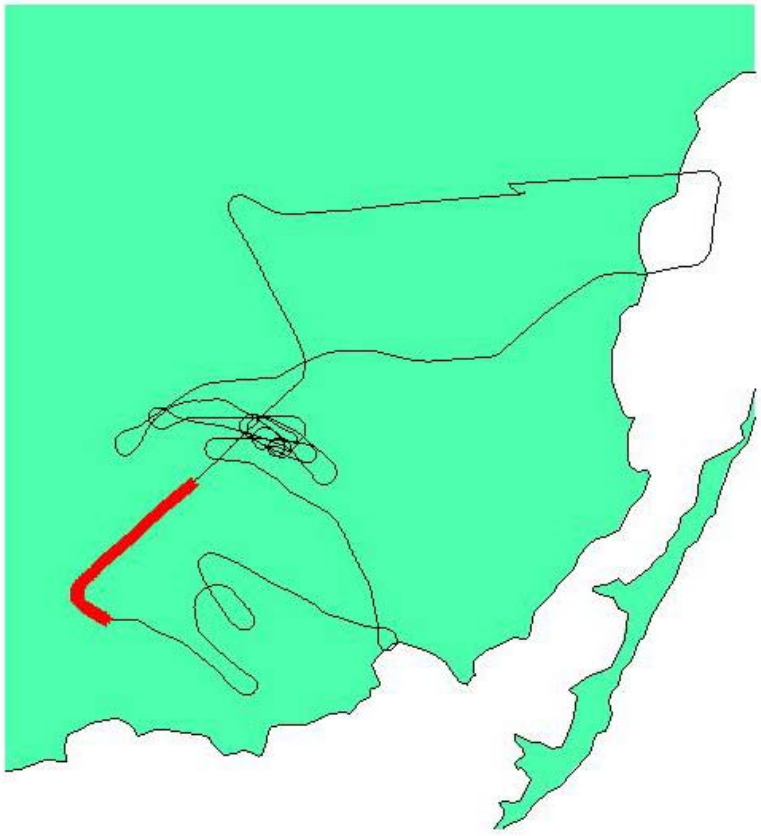
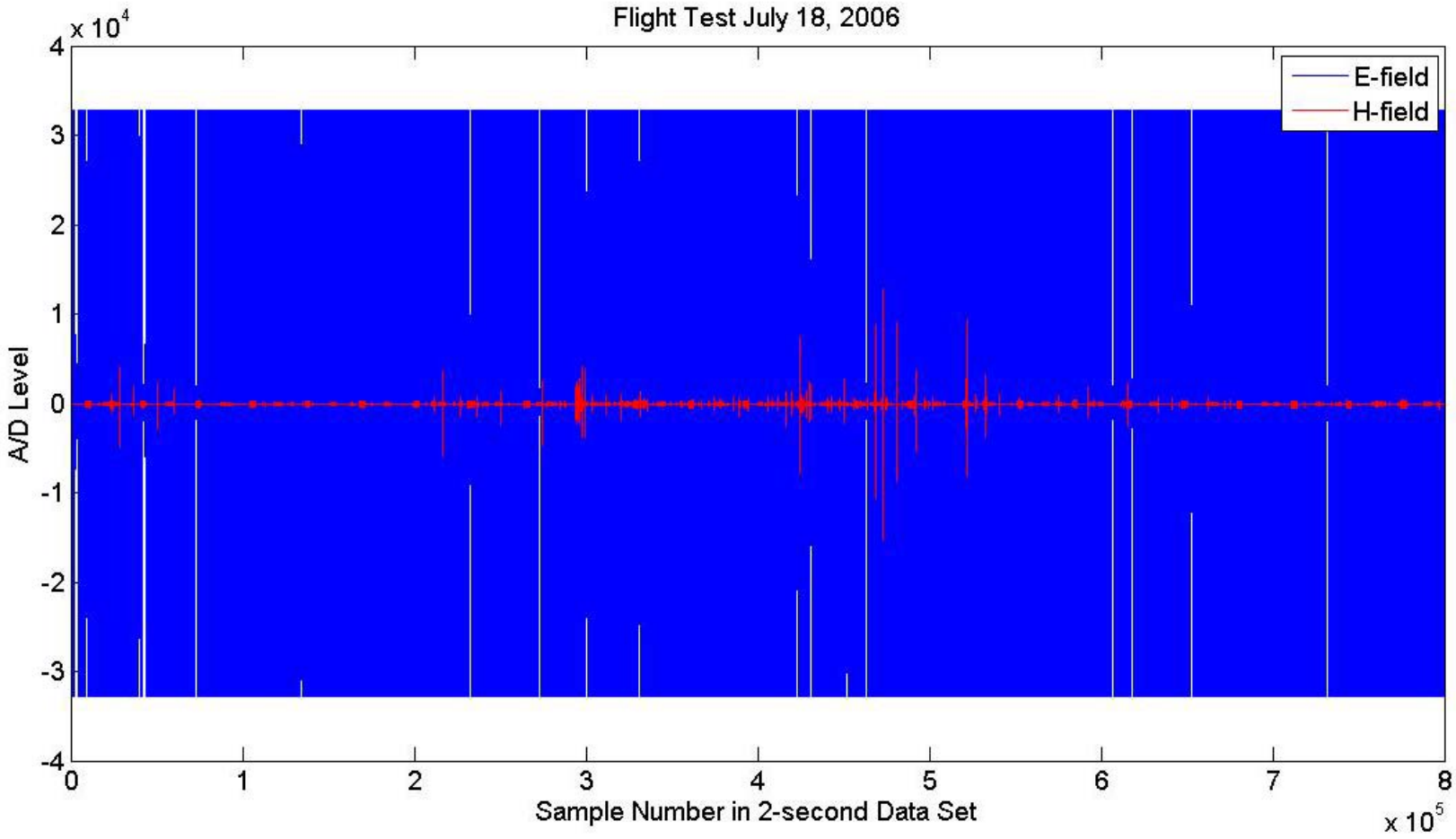




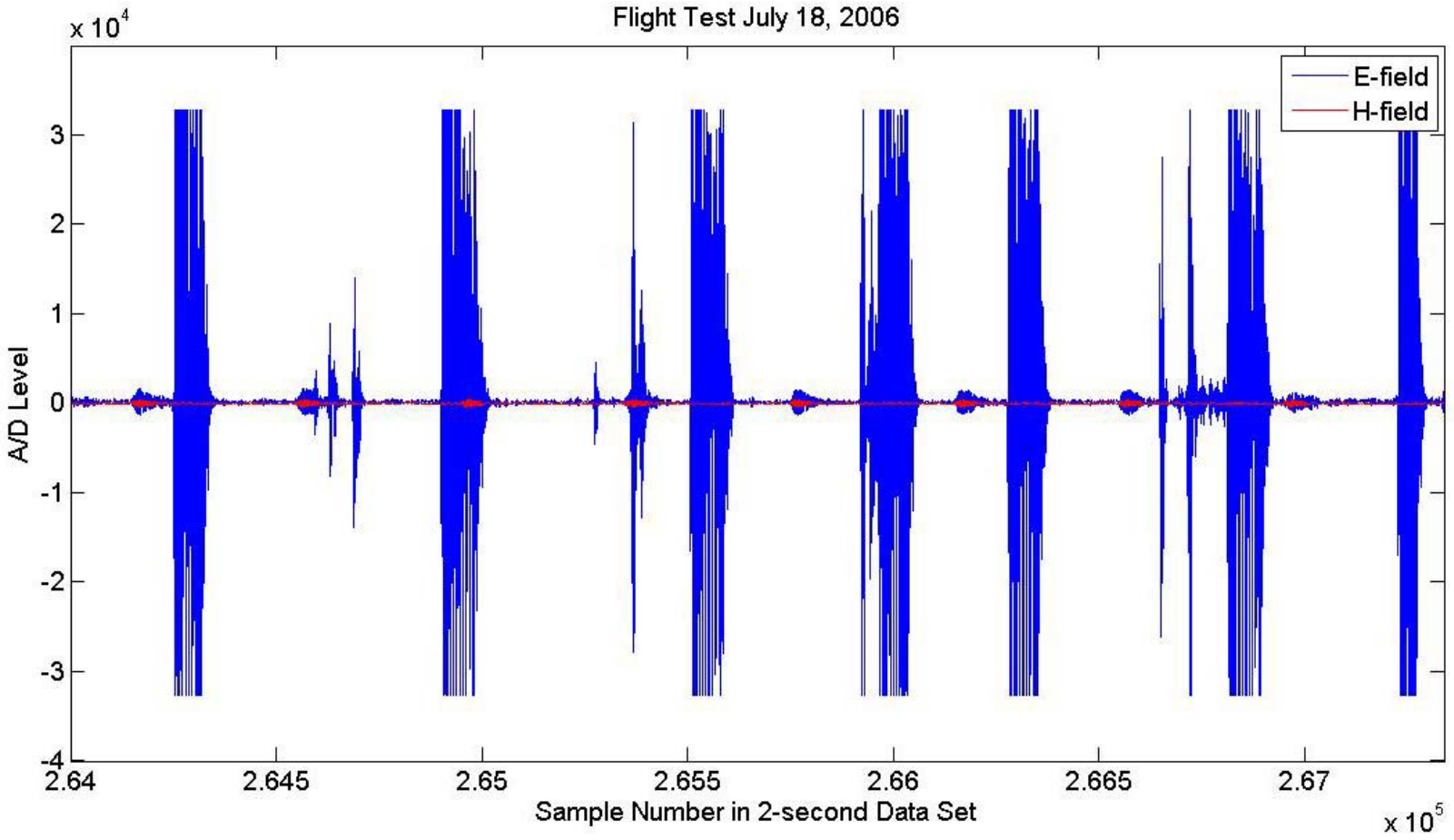
July 18, 2006 – P-Static (1 of 6)



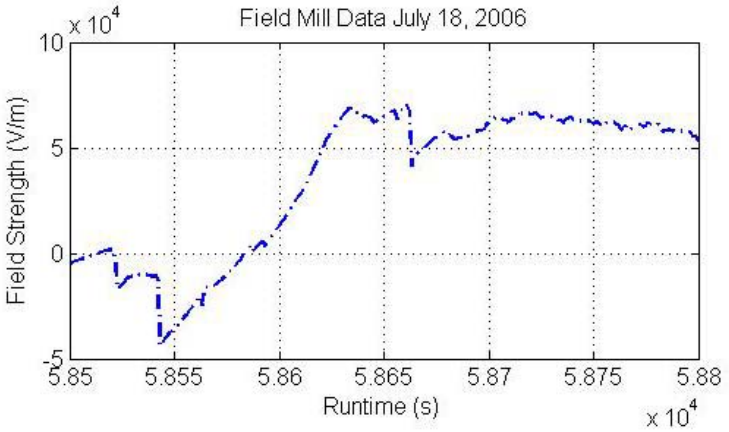
July 18, 2006 – P-Static (2 of 6)

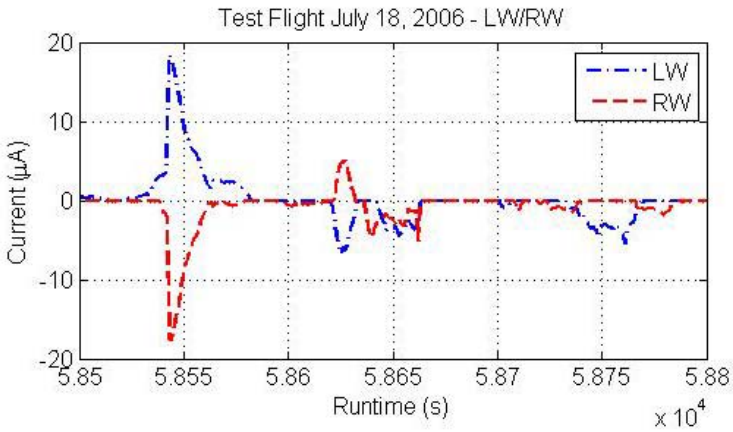


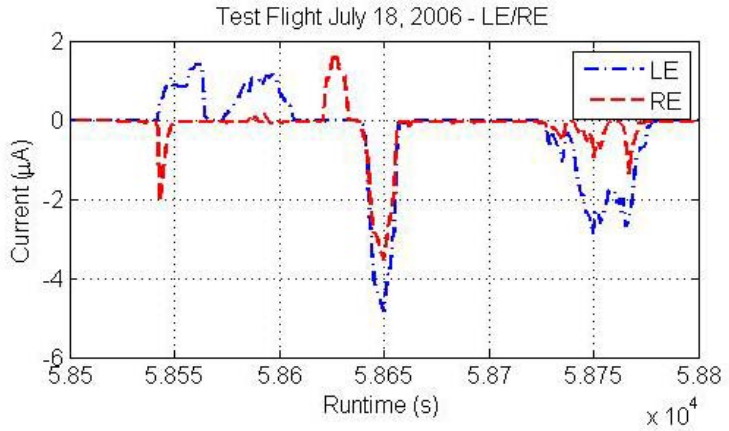
July 18, 2006 – P-Static (3 of 6)

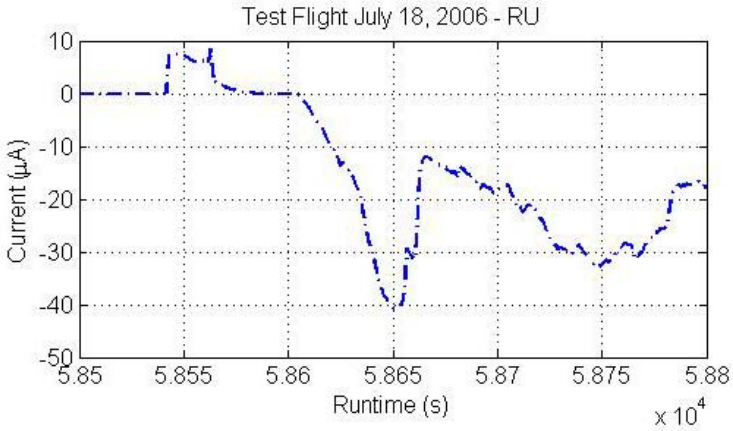


July 18, 2006 – P-Static (4 of 6)









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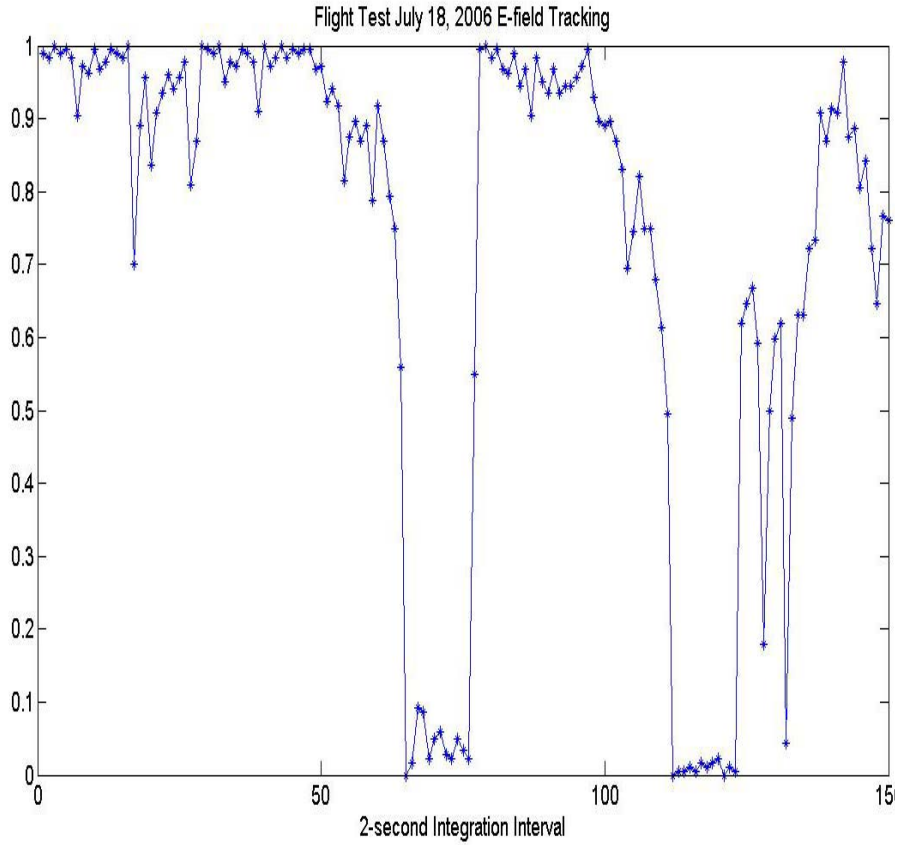

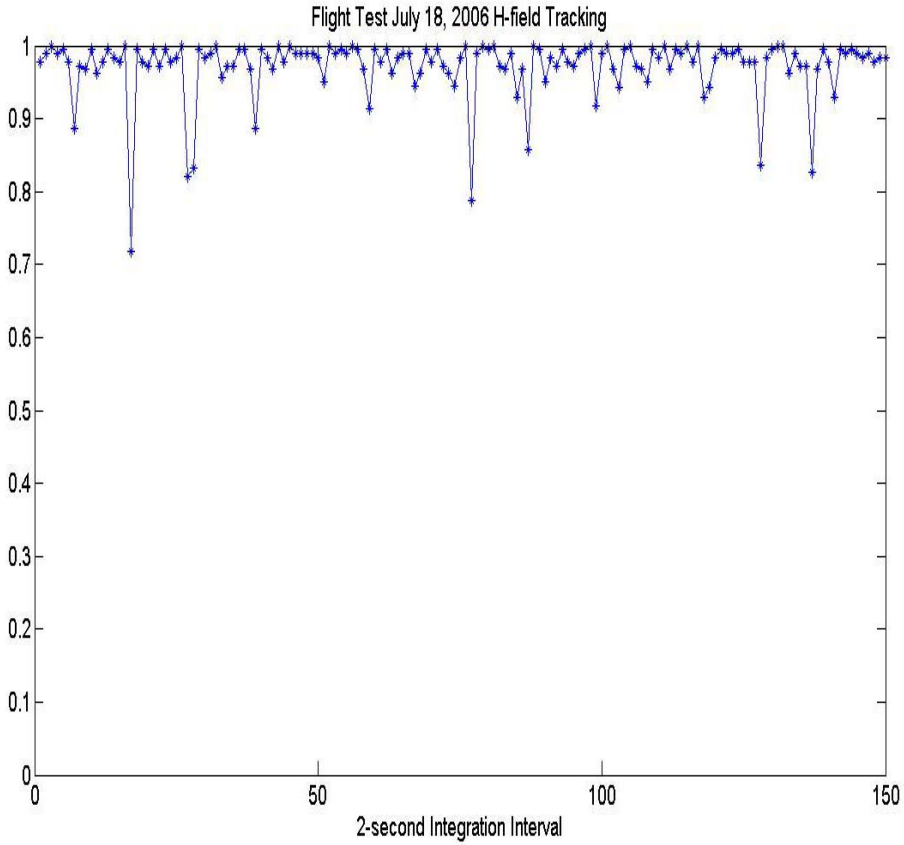

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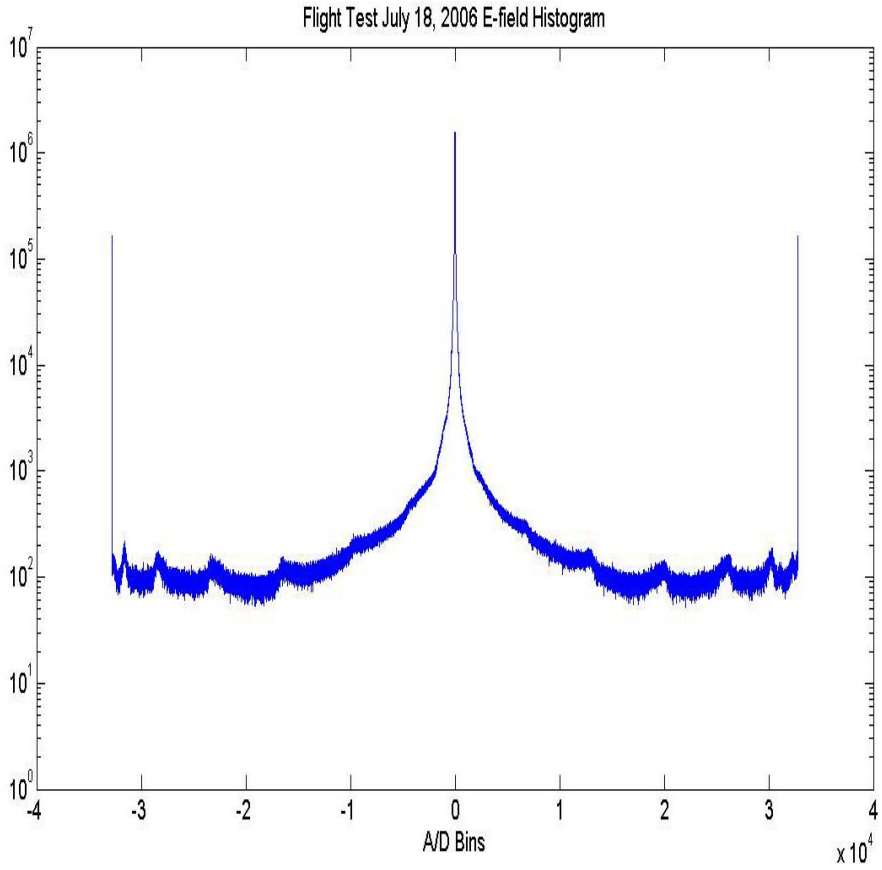

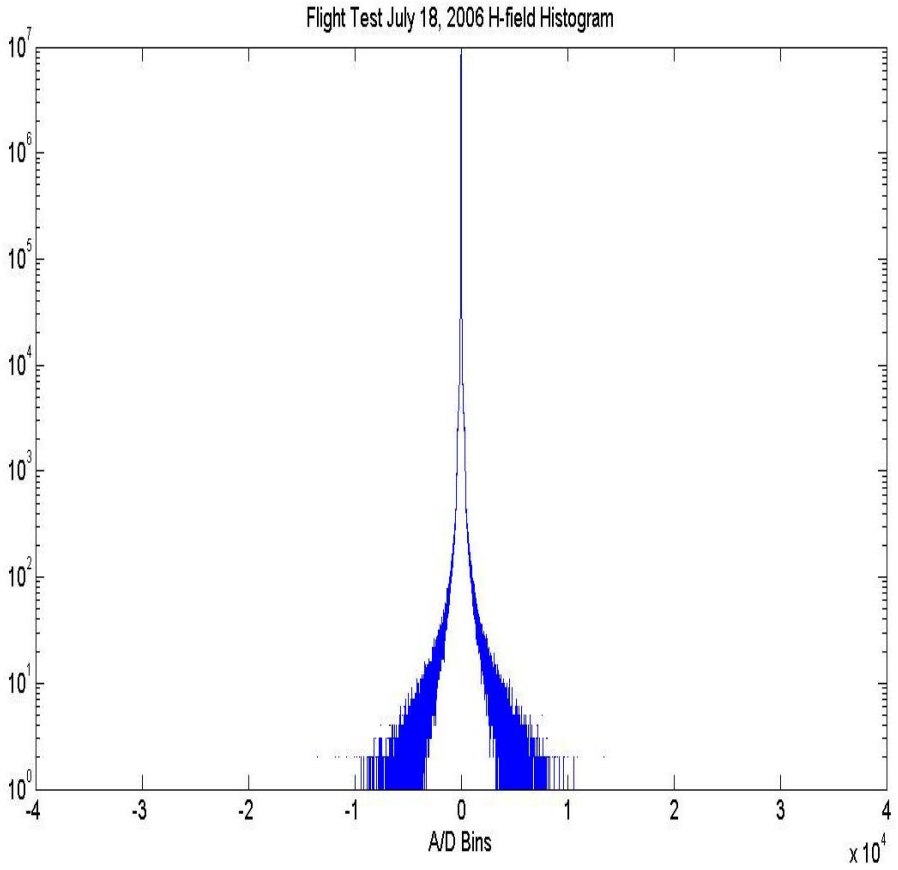

Conclusions (1 of 3)

- July 14 flight test provides baseline clear data
  - Tracking performance for both e-field and h-field antennas are almost identical
  - Differences in the e-field and h-field histograms can be attributed to the higher gain of the e-field antenna

Conclusions (2 of 3)

- Moderate-to-severe lightning was in the area for the July 18 flight
  - Effects are generally similar for both e-field and h-field antennas
  - Although tracking was not severely impacted, the h-field antenna clearly performs better than e-field antenna

Conclusions (3 of 3)

- Significant p-static conditions were encountered during the July 18 flight
  - Results showed that the h-field antenna is not significantly affected by aircraft charging
  - E-field tracking loss correlates well with periods of significant discharge activity
  - H-field tracking deficiencies are loosely correlated with severe aircraft discharges but tracking recovers quickly

QUESTIONS

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