Observing Altimetry System Error (ASE)
B737 Fleet

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FAA ANG-E61

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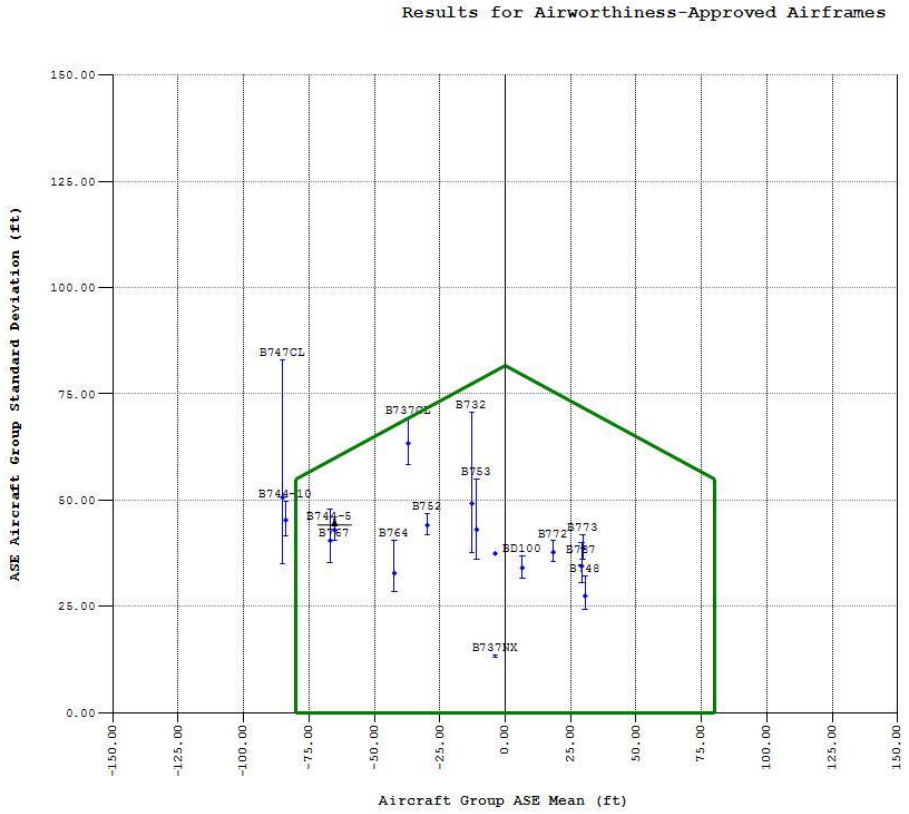
Federal Aviation
Administration

Overview

- B737s are split in two separate groups based on their expected ASE performance characteristics
  - B737CL and B737NG
- Large Altimetry System Error (ASE) was identified in several B737 airframes
- Initial analysis examined the performance differences between these two groups
- The identified cause and corrective actions are provided for discussion

ASE Group Performance Requirement



Aircraft Groups Monitore	
B732	26
B737CL	288
B737NX	1781
B744-10	309
B744-5	86
B747CL	16
B748	70
B752	651
B753	38
B764	37
B767	504
B772	416
B773	351
B787	95
BD100	341

Note: ASE variance estimate reduced by assumed measurement variance of (45.4 ft²)
Date of Chart: Friday, February 13, 2015

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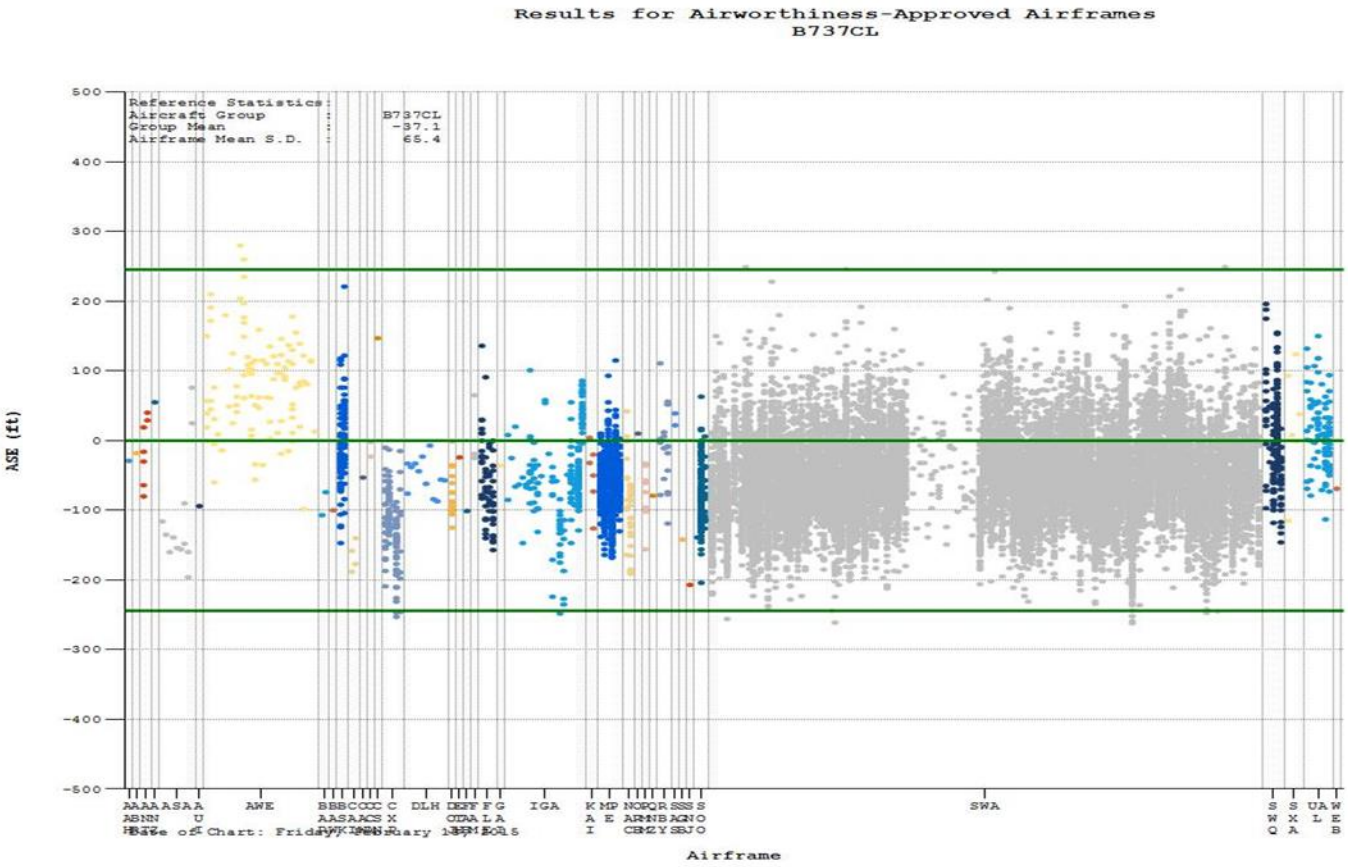
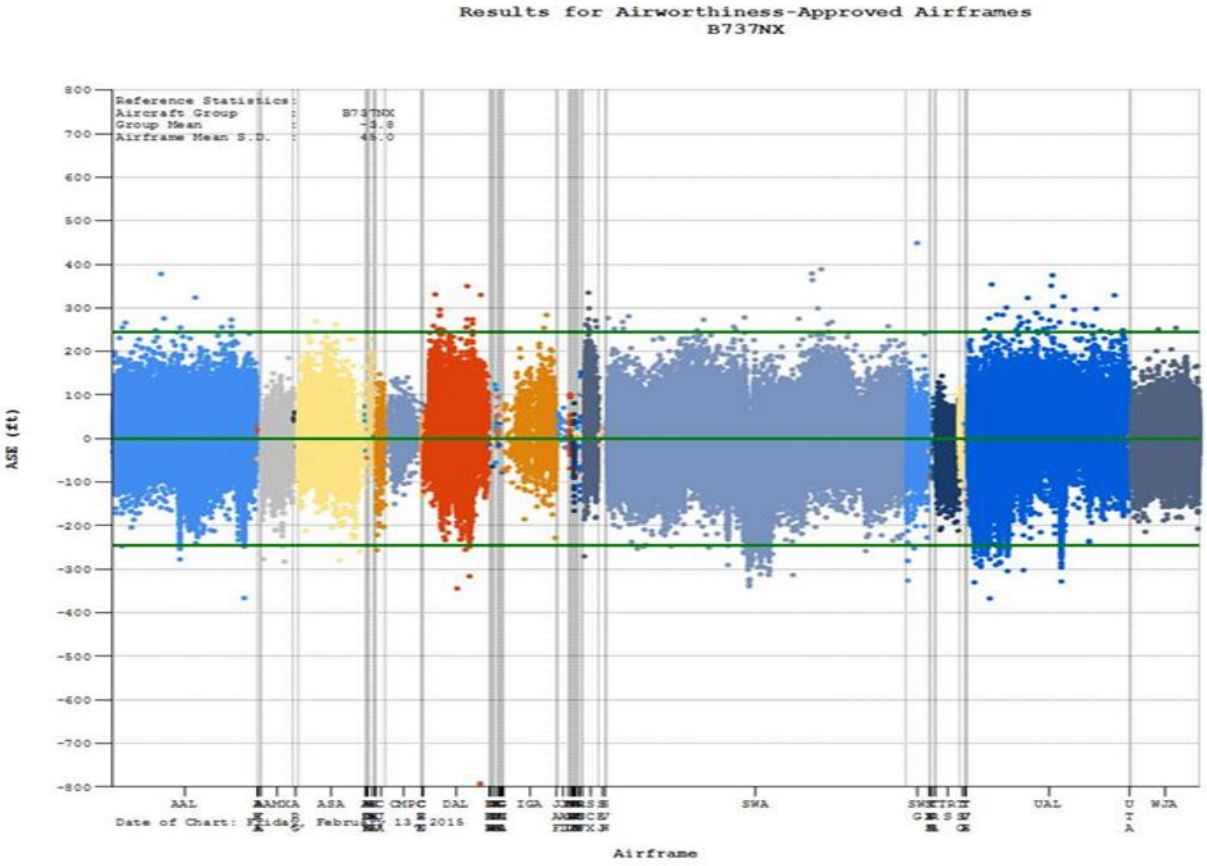
ASE Observations B737 Classic



ASE Observations B737 NextGen



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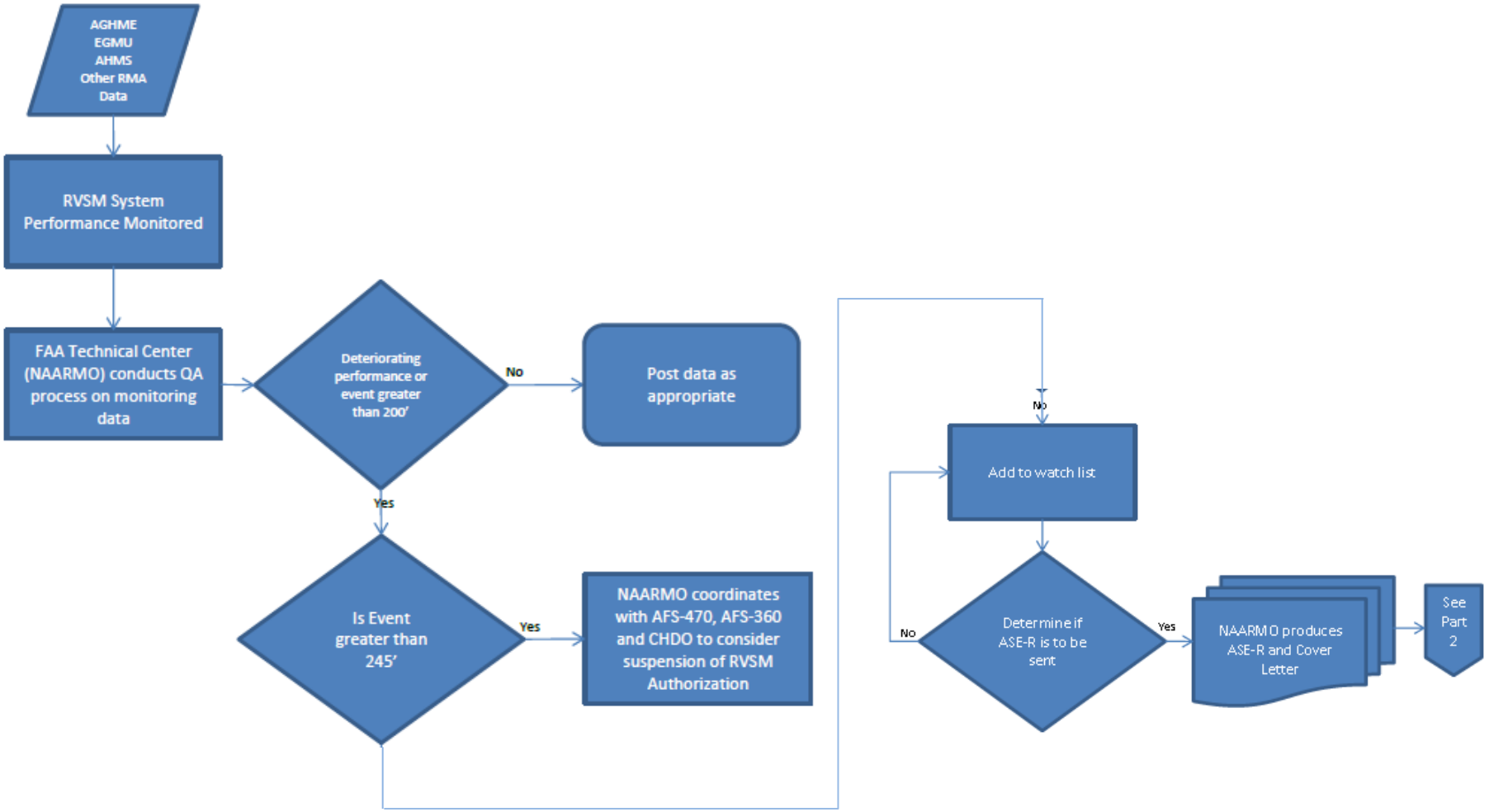
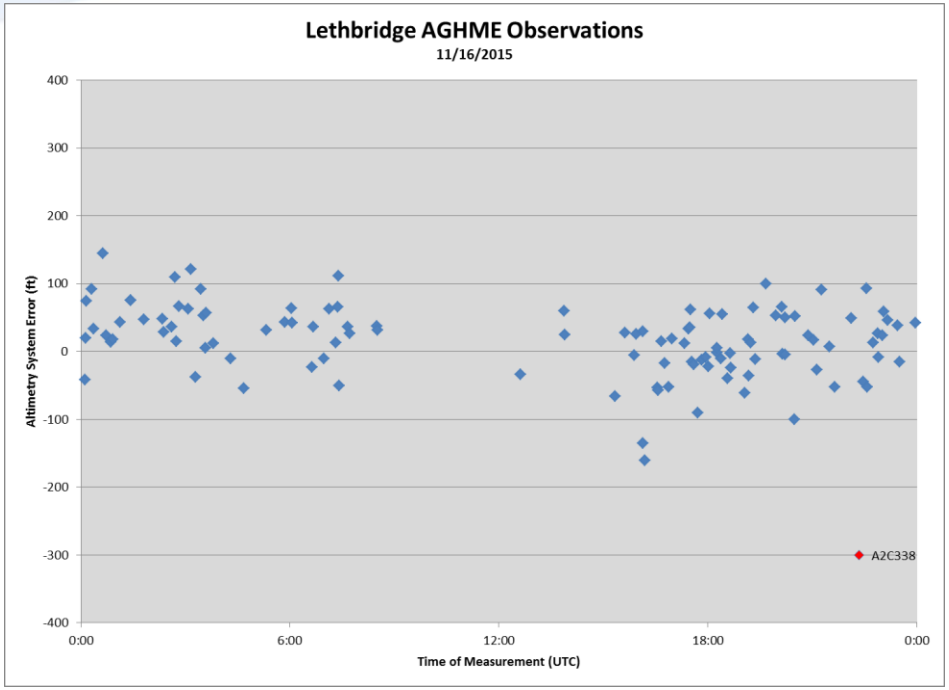
ASE Evaluation Process



Issue for Discussion

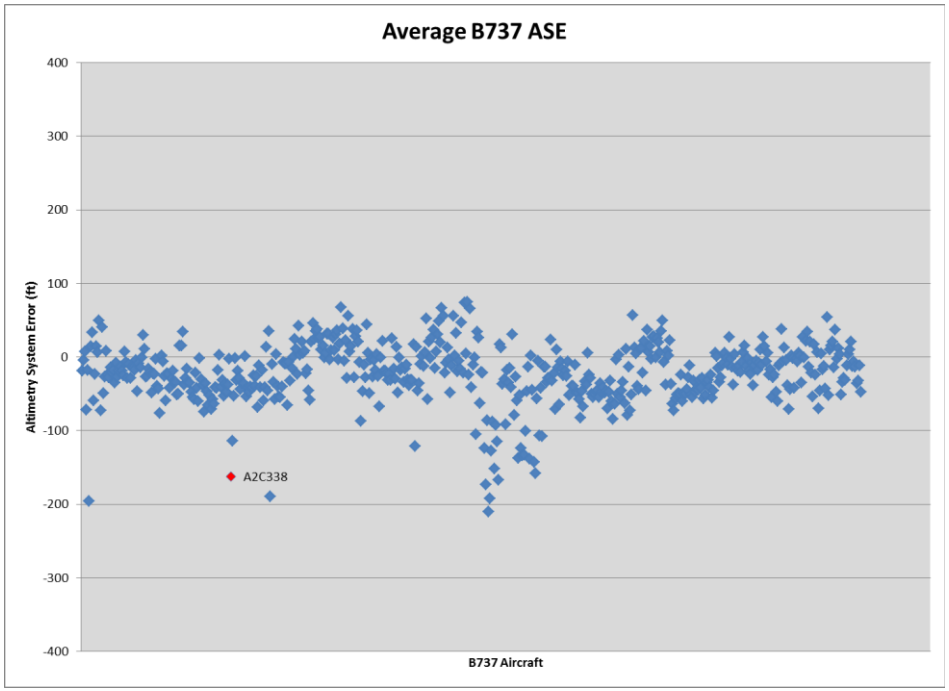
- Several B737 aircraft have been identified in Altimetry System Error Reports (ASE-Rs)
- Job-Aid ASE-R flow chart decision blocks are evaluated by an experienced team aware of ASE measurement challenges and error distribution
- Individual ASE measures greater than 245ft do not always automatically trigger an ASE-R
  - ASE must be taken in context of an ensemble of measurements from a particular AGHME or aircraft
  - Extreme ASE measures trigger an automatic report

ASE-R Example Charts



Measurements of ASE on all other aircraft where a large ASE was observed on the subject aircraft

Average ASE of all other aircraft in the subject aircraft's monitoring group



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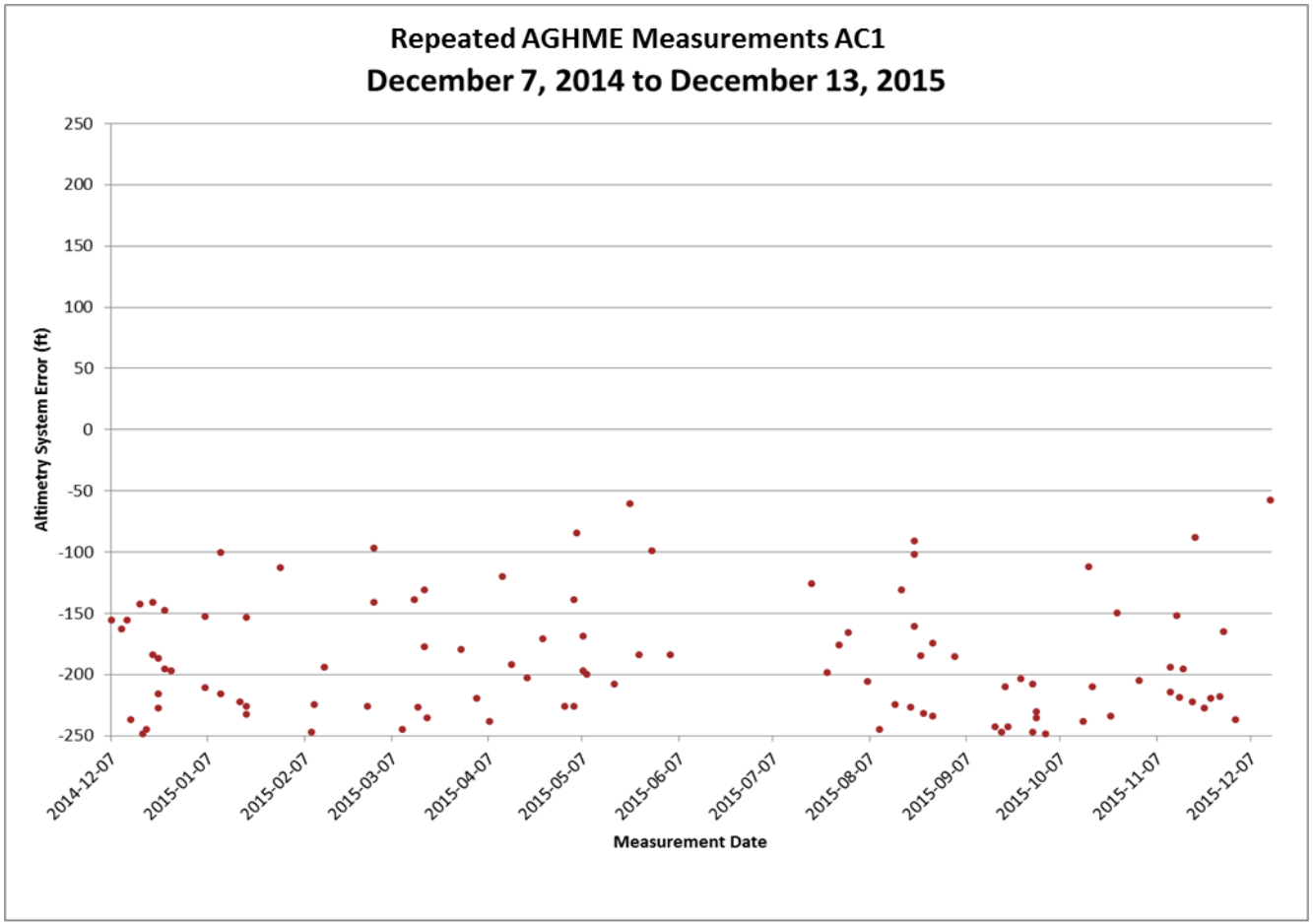
ASE Measurement
737-7H4 First Flight 6/25/1999

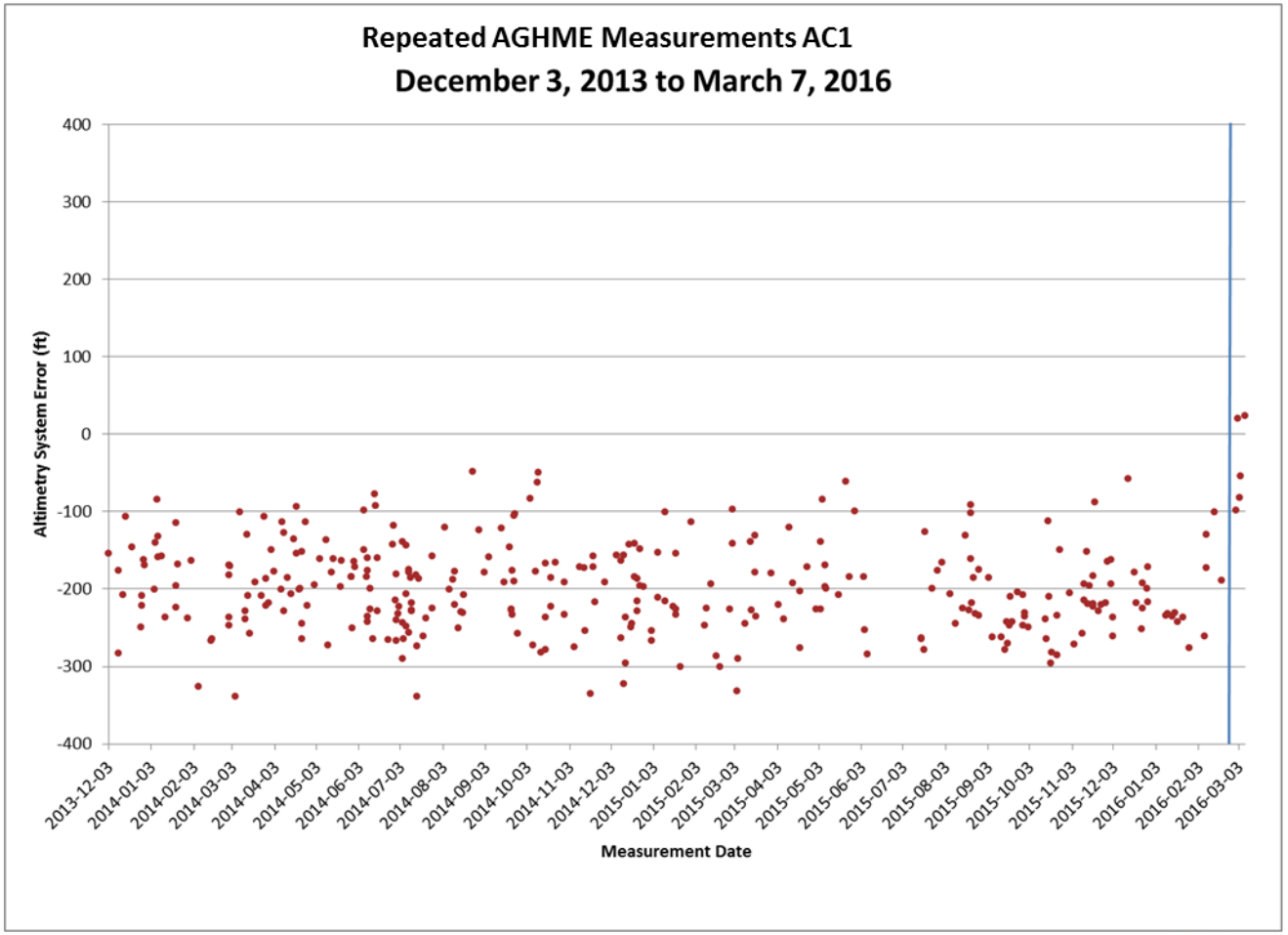


ASE-R Issued

Resolution Aircraft 1

- Operator performed Boeing AMM task 34-21-00 to test the Air Data Modules on both primary systems. Test confirmed that both Air Data modules for the static source systems were defective and replaced. RVSM critical area was inspected with no findings. Work Completed 22 Feb, 2016

ASE Measurement Aircraft 1 Resolved



ASE-R Closed

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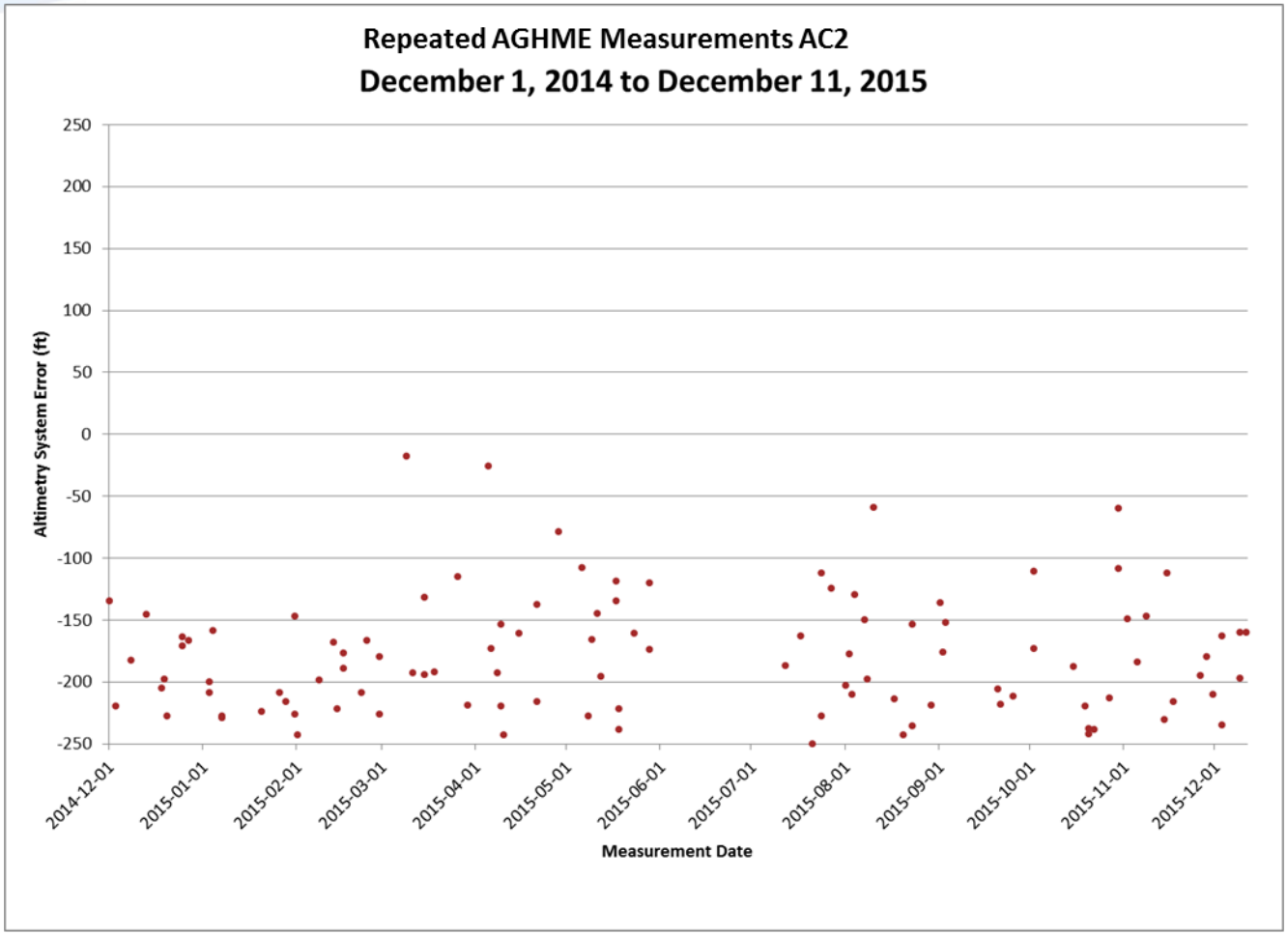
Example ASE Measurement

737-7H4 First Flight 6/25/1999

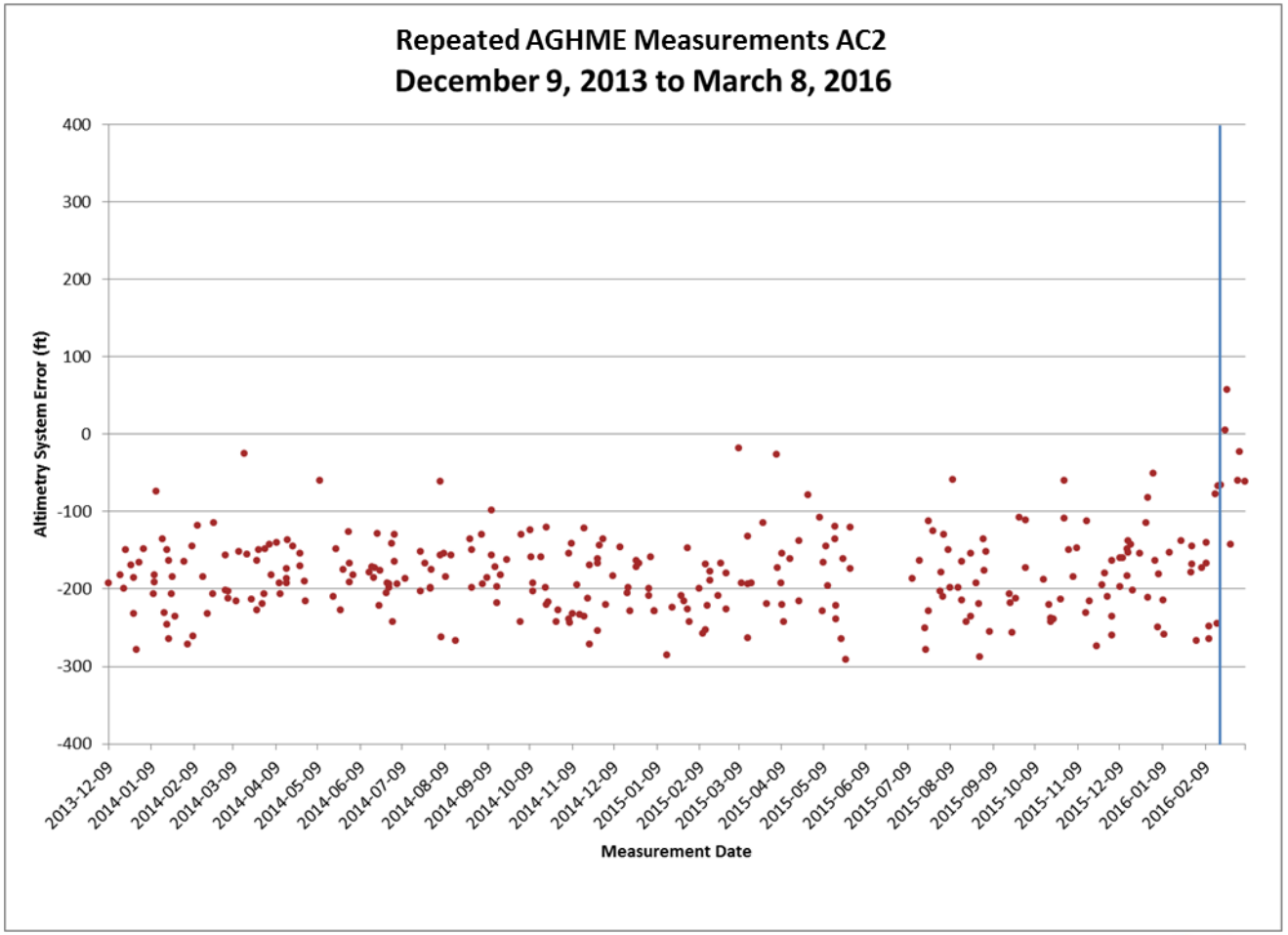


ASE-R Issued

Resolution AC2

- Operator performed Boeing AMM task 34-21-00 to test the Air Data Modules on both primary systems . Test confirmed that both Air Data modules for the static source systems were defective and replaced. RVSM critical area was inspected with no findings. Work Completed 22 Feb, 2016

ASE Measurement Aircraft 2 Resolved



ASE-R Closed

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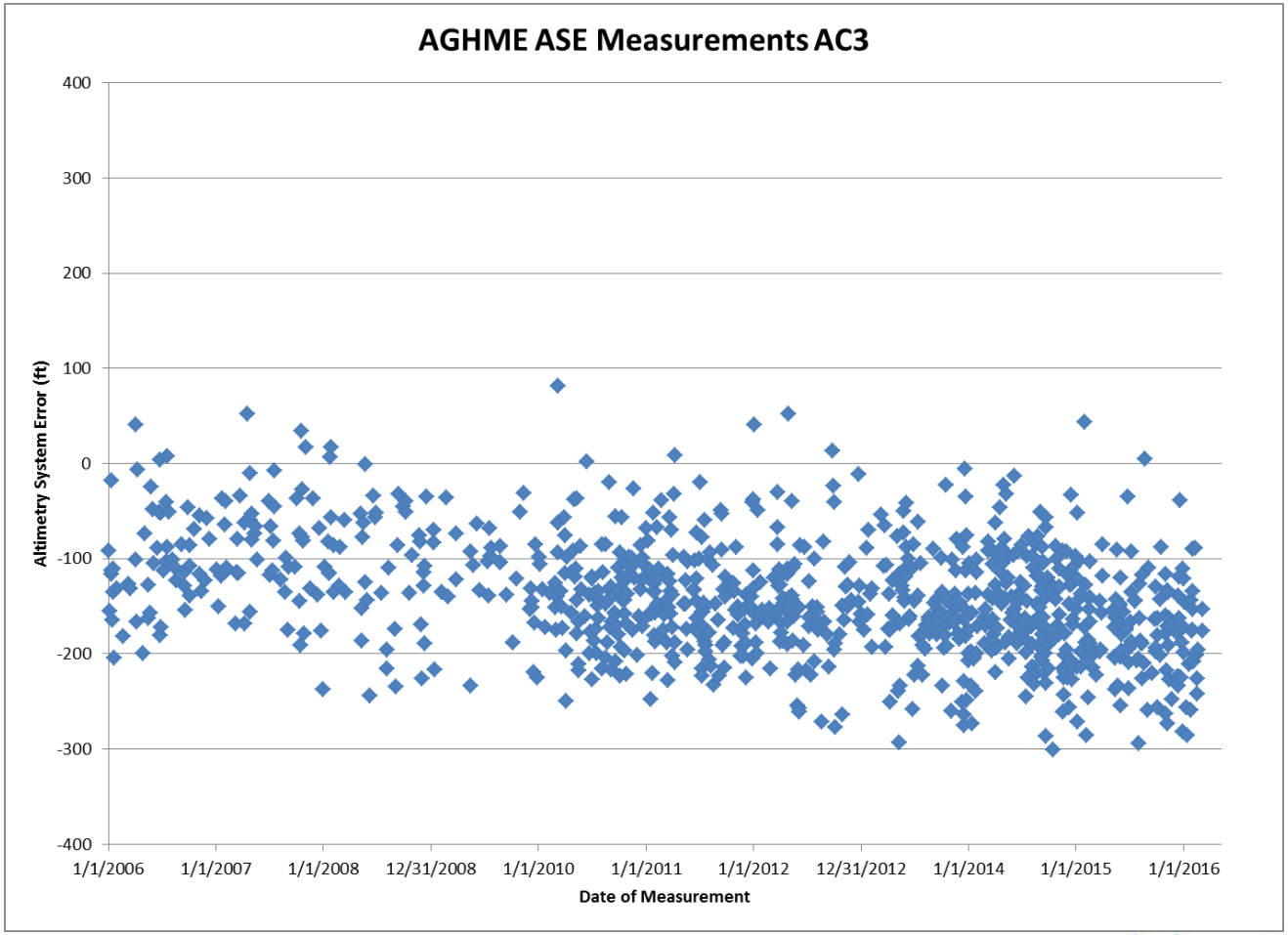
B737 Long-Term Trend AC3



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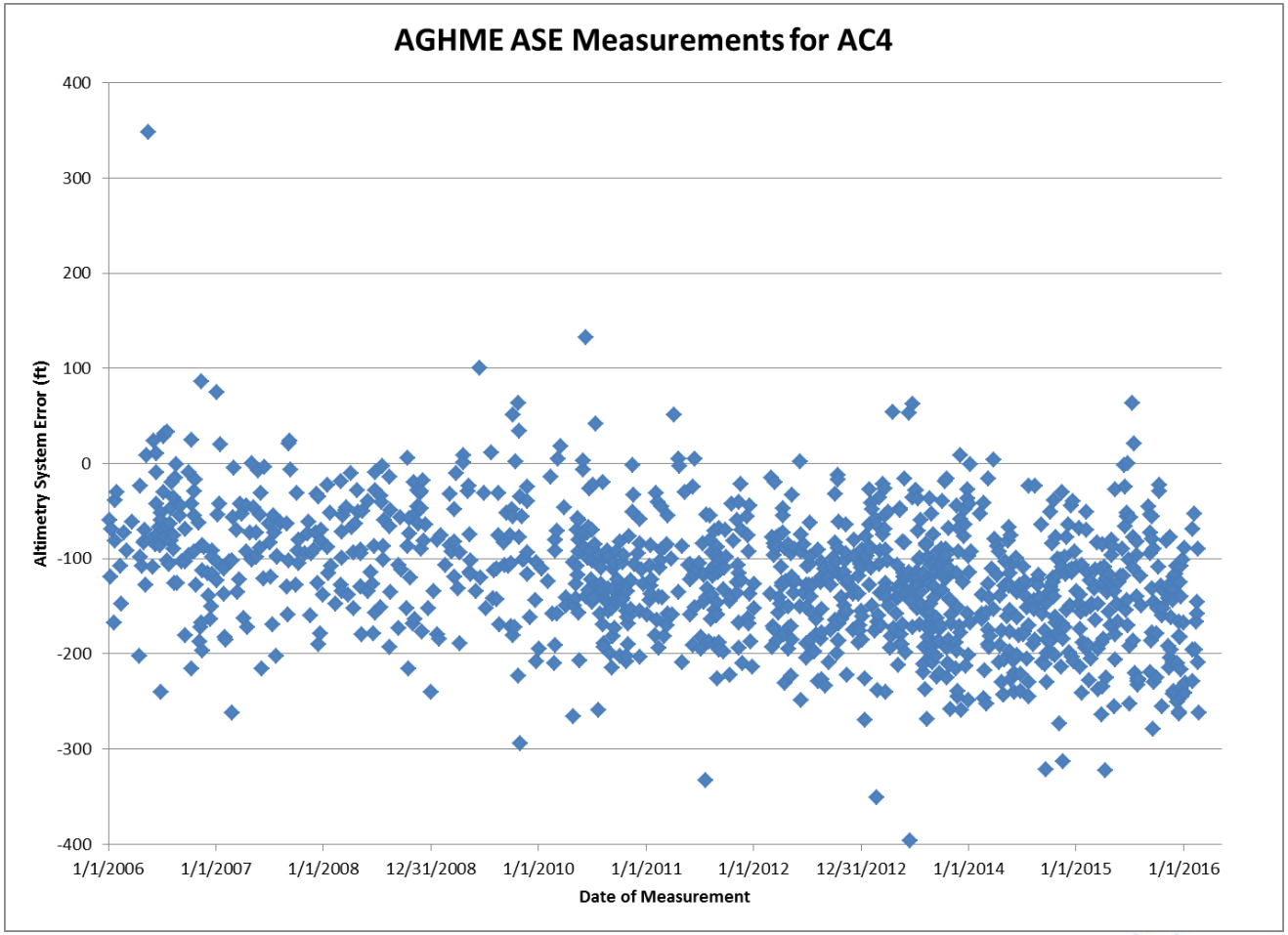
B737 Long-Term Trend AC4



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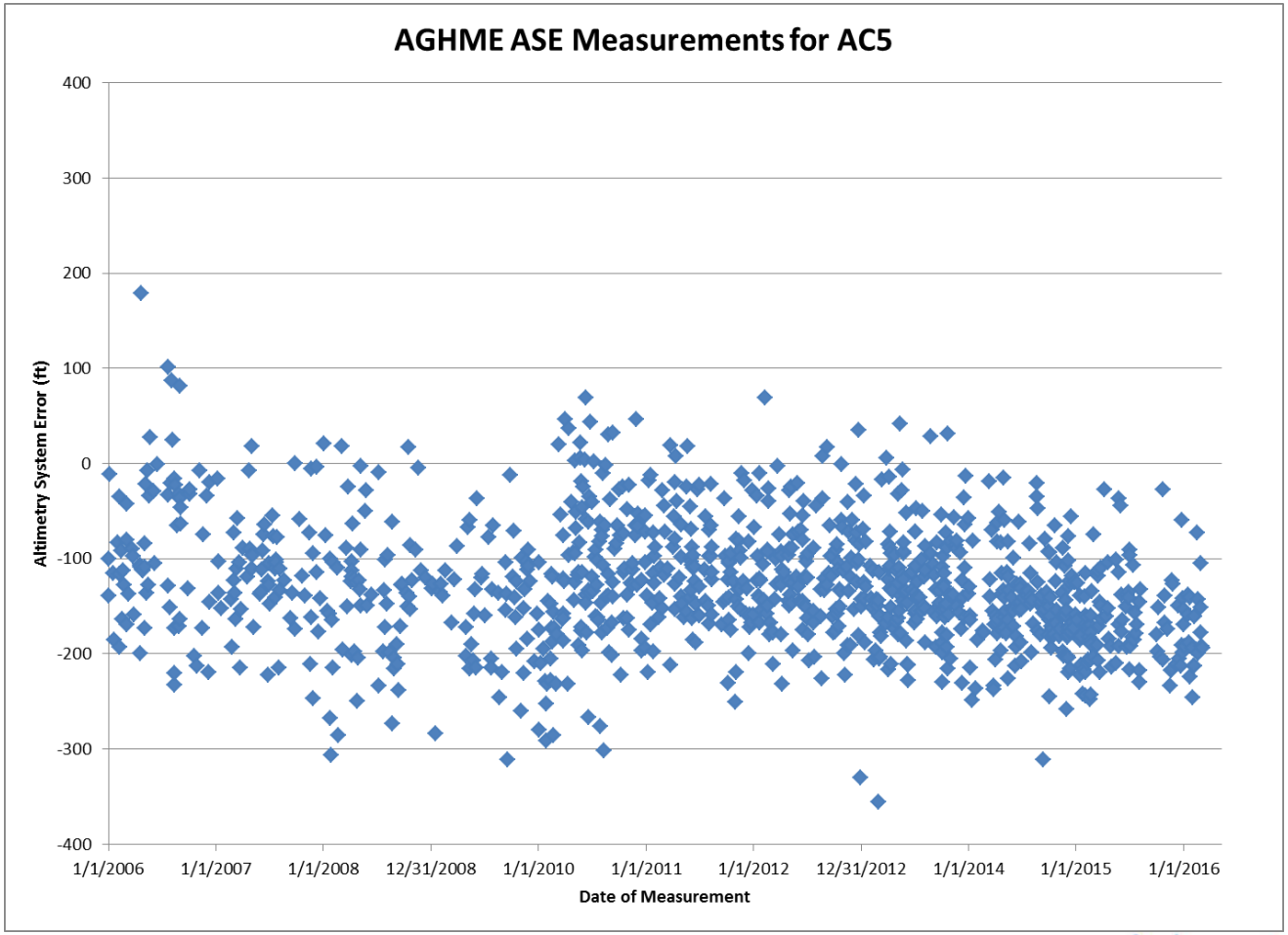
B737 Long-Term Trend AC5



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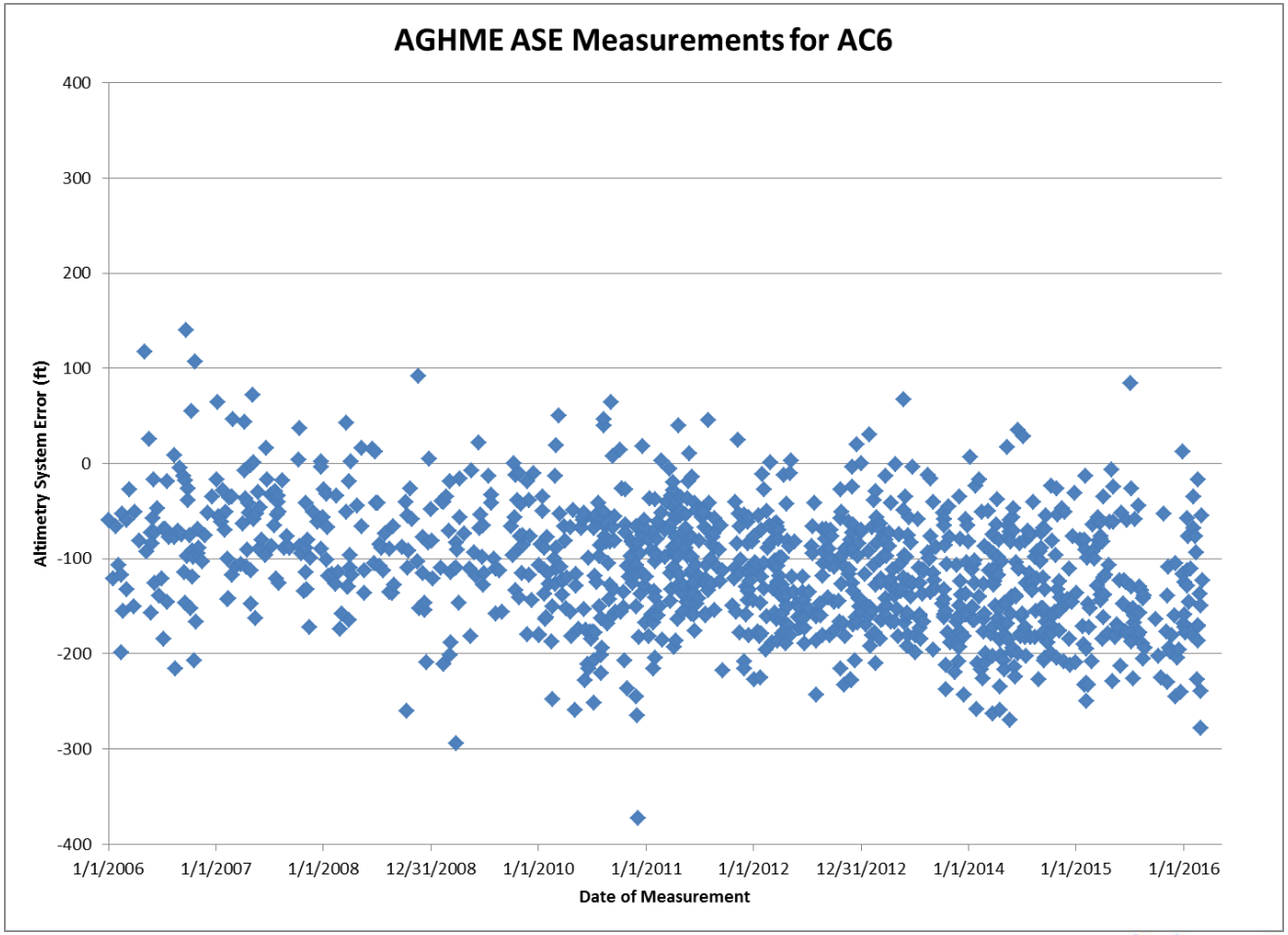
B737 Long-Term Trend AC6



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Summary

- Large ASE reported for AC1 and AC2 has been addressed by replacement of static Air Data Modules which were found to be out of tolerance
  - Error developed over 10 years of aircraft service
- Similar long-term trend was identified in additional B737 aircraft
- Maintenance did not detect the failing ADMs