

CSET In-Situ Data

CSET Science Meeting

14-15 Jun 16

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Overall

- Release of LRT and HRT data (minor complications)
- Data quality is overall very good
- Minor recurring issues
 - Fast response temperature sensor
 - Chilled mirror dewpointers
 - UHSAS/MTP
- Discussion items
 - 2DS
 - Winds
 - UHSAS

Methodology (Copper)

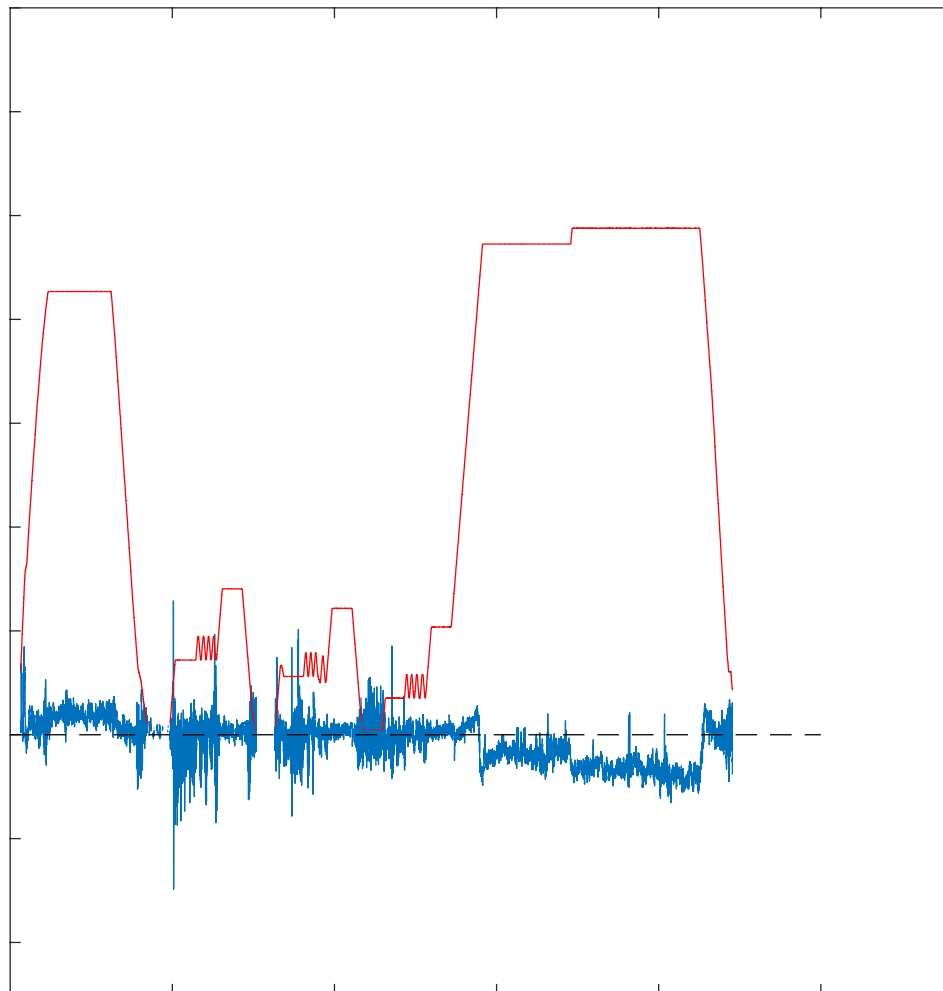
- Calculate a reference angle of attack:

$$\alpha^* = \theta - \frac{w_p}{V}$$

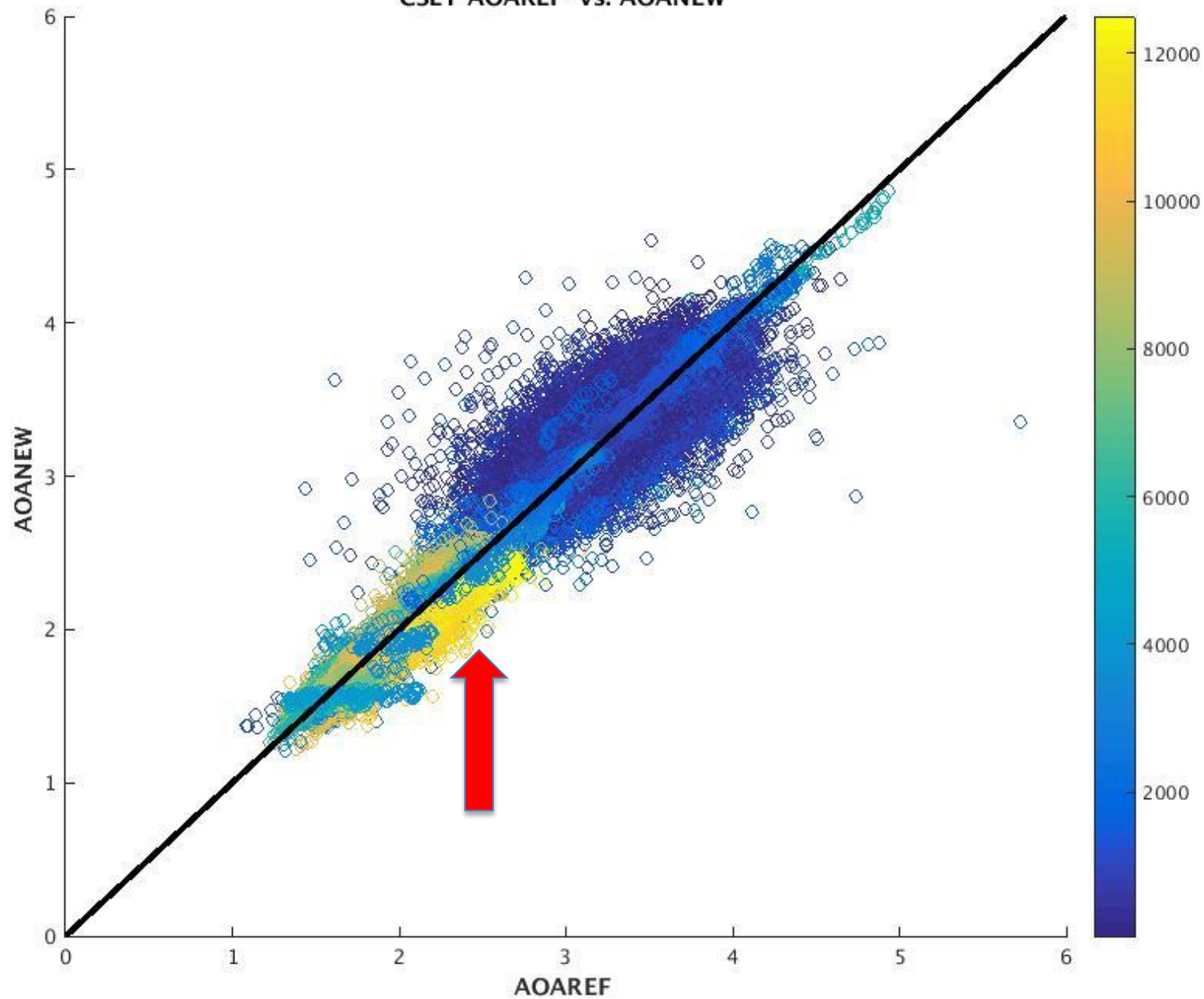
- Determine coefficients to the AOA that best fit the distribution:

$$\alpha = c_0 + \frac{\Delta p_\alpha}{q} (c_1 + c_2 M)$$

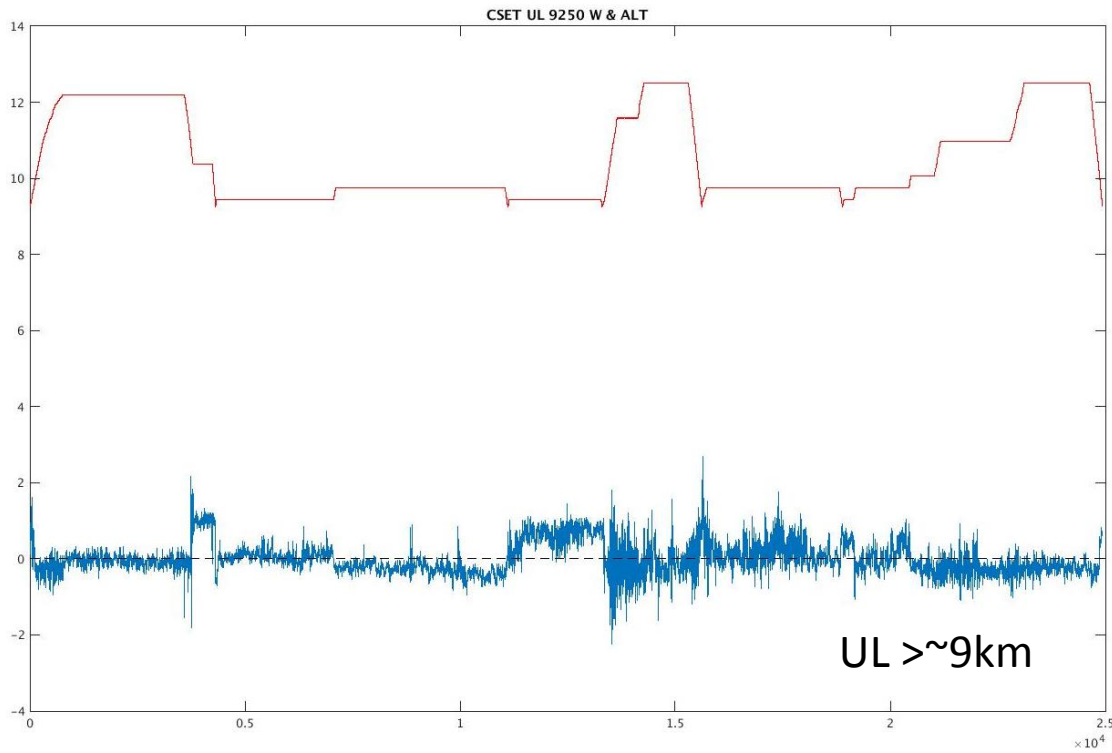
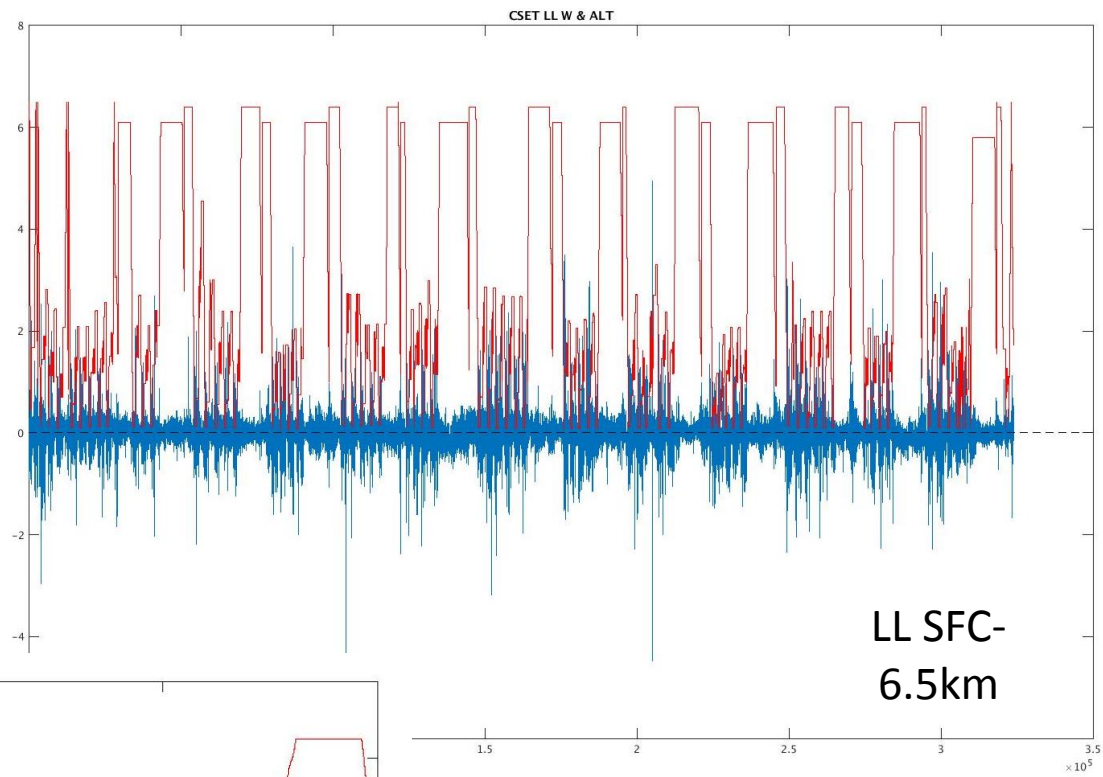
The Issue



CSET AOAREF vs. AOANEW



- CSET Solution
 - Release data with altitude-dependent coefficients
 - Does not entirely fix problem





Aerosols

UHSAS and CN Performance



UHSAS:

0.06-1.0 μm in 99 size bins

Ran well generally, much improved over previous projects.

CN:

0.011-3.0 μm , total count

Full data coverage



Aerosols

UHSAS and CN Performance



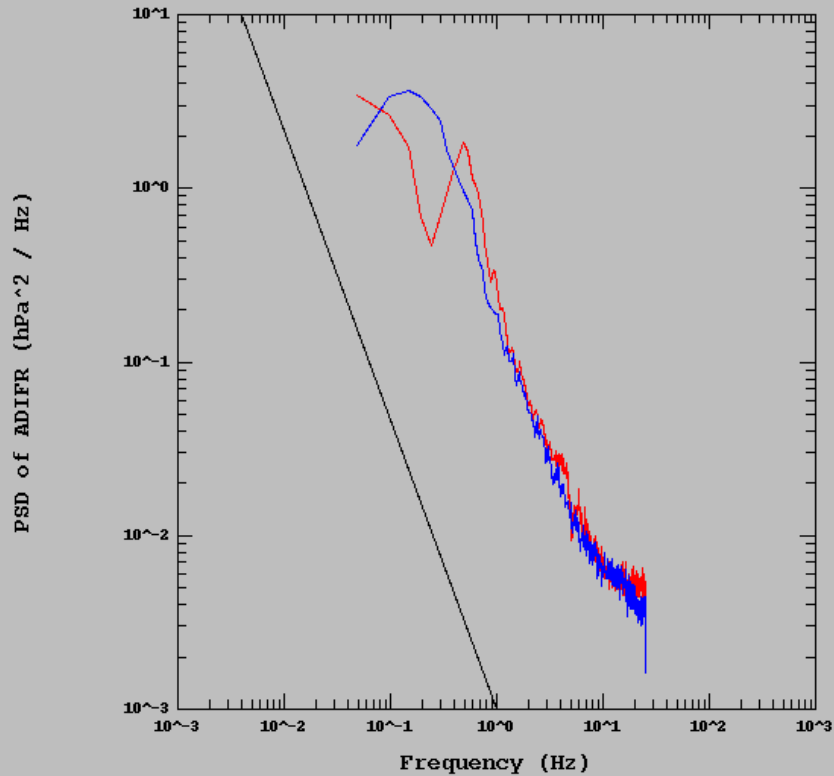
But, some problems:

| UHSAS | CN Counter |
|---|--|
| Overheating in warm air — forced shutdown \approx 10 min. most low-level sequences. | Inlet high and far back from nose — slight particle loss possible. |
| Frequent noise in small-diameter bins — must discard first 8. → 91 size bins, 75 nm effective lower bound. | |

Backup

CSET ADIFR/BDIFR

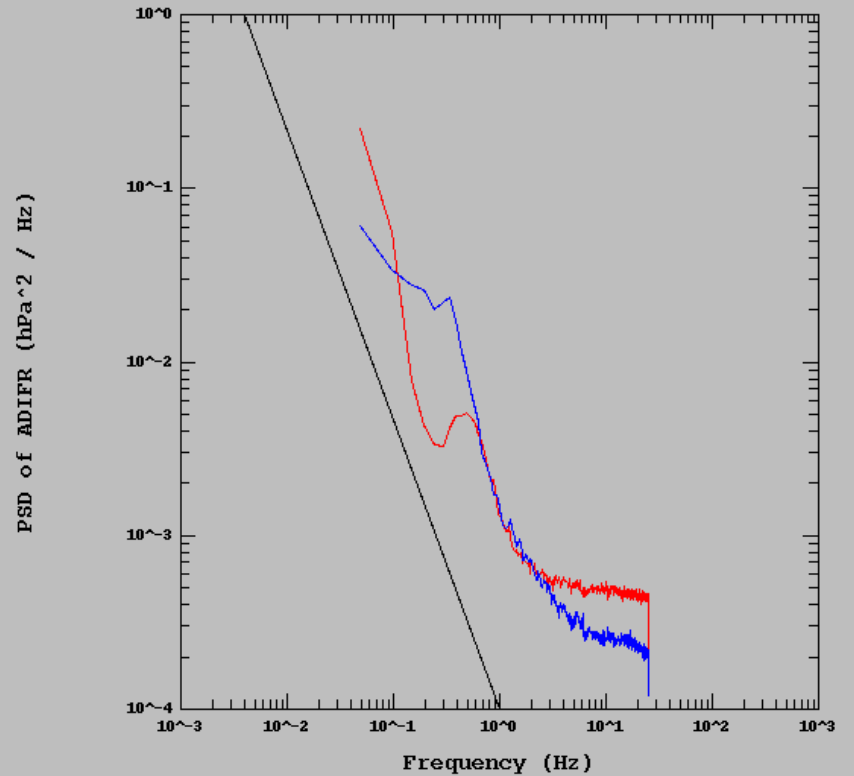
CSET, Flight #rf06
07/17/2015, 16:57:32-17:18:20
This plot contains preliminary data



Total variance = 1.62948
Variance (w/o DC component) = 29.4119
K = 123, M = 512, nPoints = 62400:

Low Alt

CSET, Flight #rf06
07/17/2015, 19:31:00-21:28:20
This plot contains preliminary data

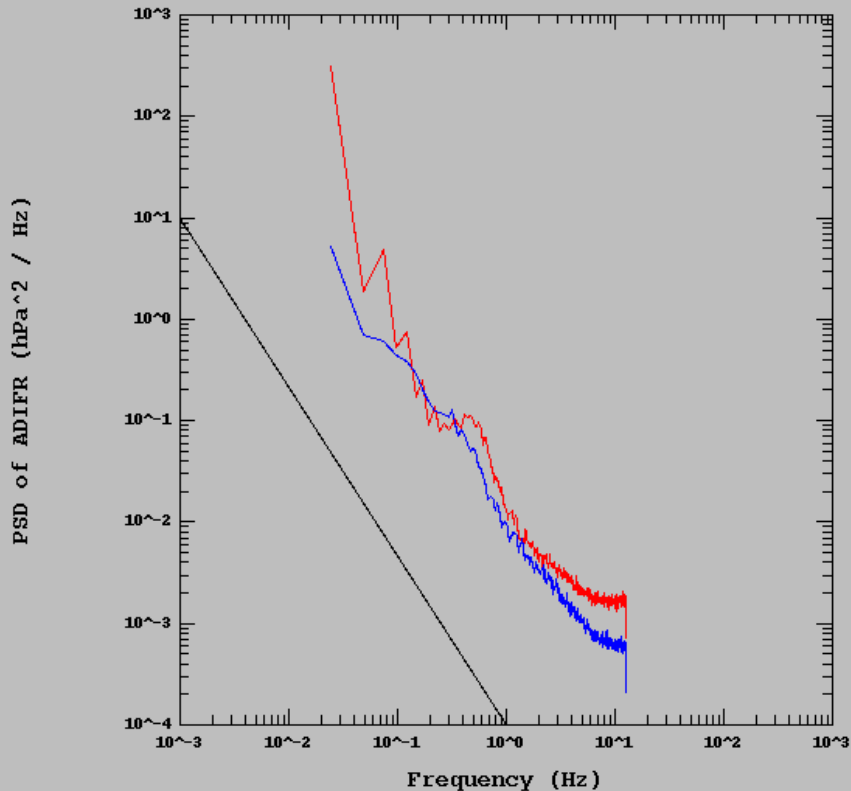


Total variance = 0.0374046
Variance (w/o DC component) = 0.586753
K = 689, M = 512, nPoints = 352000:

High Alt

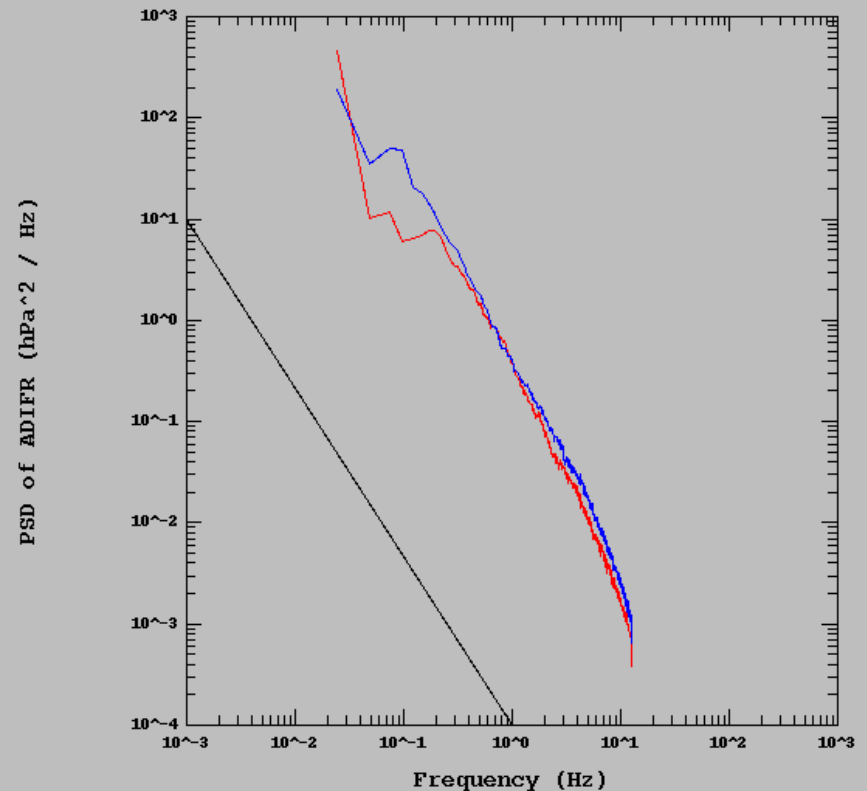
ADIFR/BDIFR

HIPPO-2, Flight #rf02
11/02/2009, 18:37:30-25:58:33



Total variance = 30.9962
Variance (w/o DC component) = 327.995
K = 1294, M = 512, nPoints = 661575::

FRAPPE, Flight #rf04
07/29/2014, 14:57:00-18:48:49



Total variance = 45.2792
Variance (w/o DC component) = 575.587
K = 681, M = 512, nPoints = 347725::

HIPPO-2

March 17, 2009 Changed transducers from Mensors sensors to new Honeywell sensors. Just before

HIPPO II

FRAPPE