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# Calibration Testing

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# Idea

- ; We have two ~independent means of calibration, which can be compared for consistency.
- ; `Official' calibration:
  - » Measure H, C during dedicated calibration run (hours). Eg. Done Feb 14-15.
  - » Fit measured H data to model, derive H, C, Cb for that time.
  - » **Dynamic**: Rescale H, C over time using alpha measured from calibration lines; update Cb.

# Idea (cont'd)

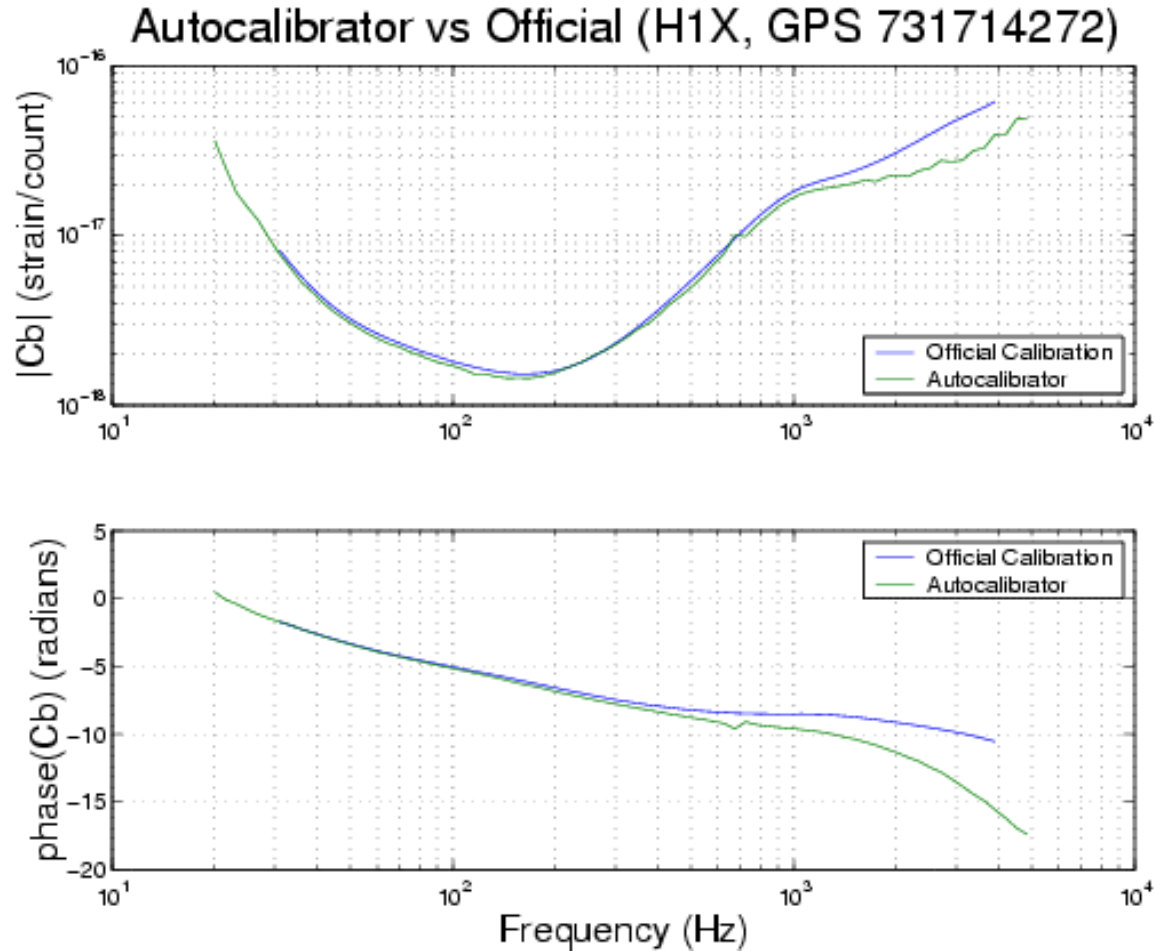
## ; AutoCalibrator:

- » Inject swept sine into ETMX/Y and measure transfer function to AS\_Q (minutes).
- » Empirical (no use of model) - independent of `official' calibrations up to treatment of actuation function  $A(f)$ .
- » Gives static snapshot of Cb.

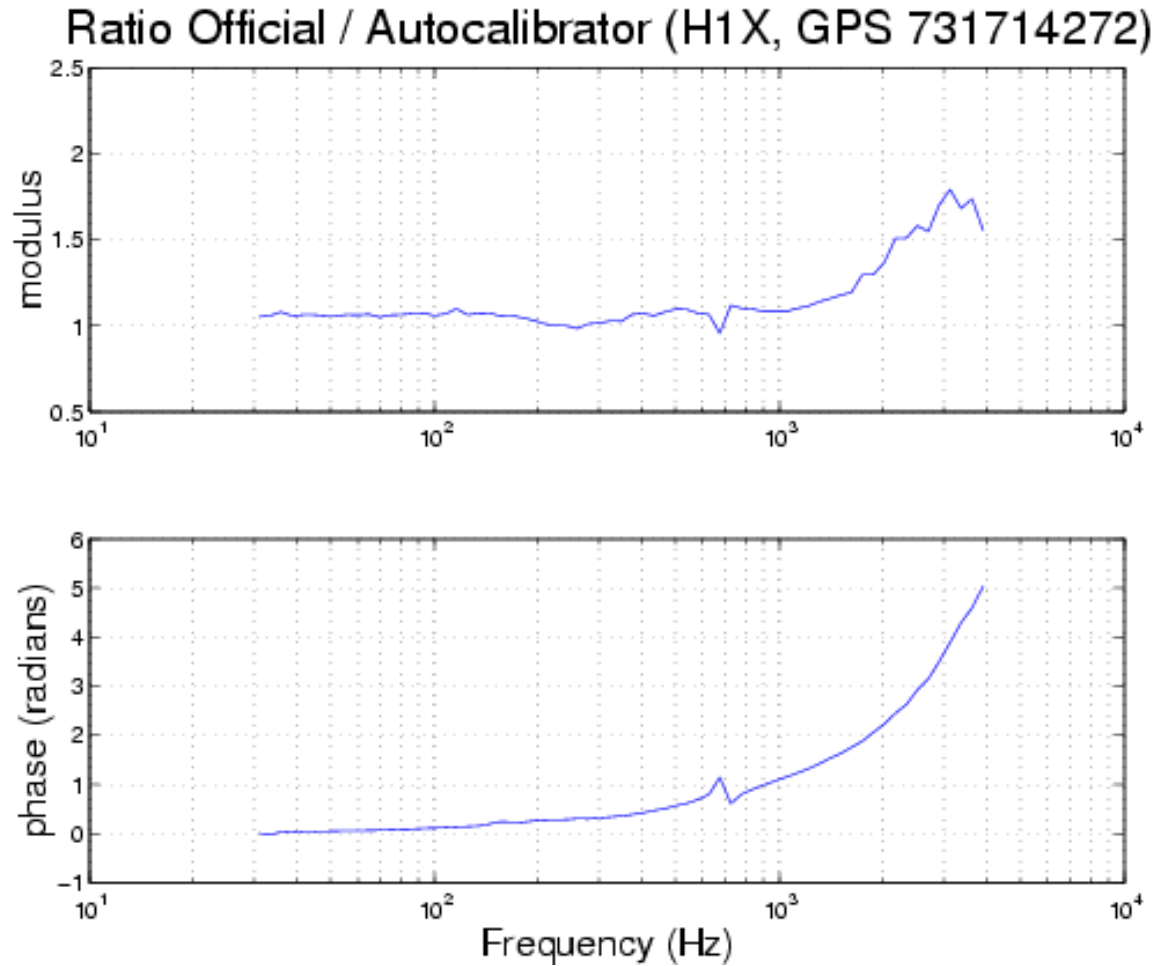
## ; Proposal: Use frequent AutoCalibrator sweeps as check on Official calibration.

This talk: show examples for S2

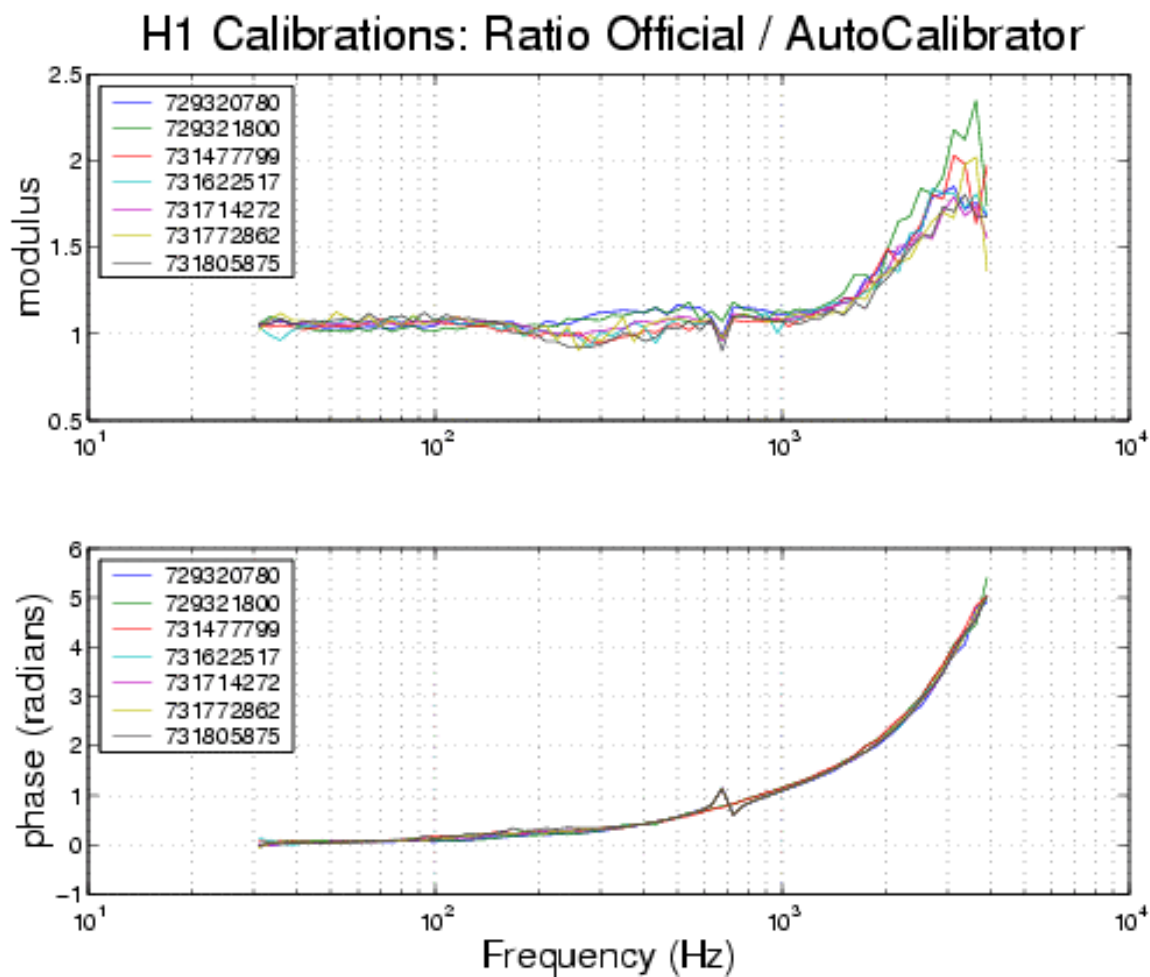
# Example: H1



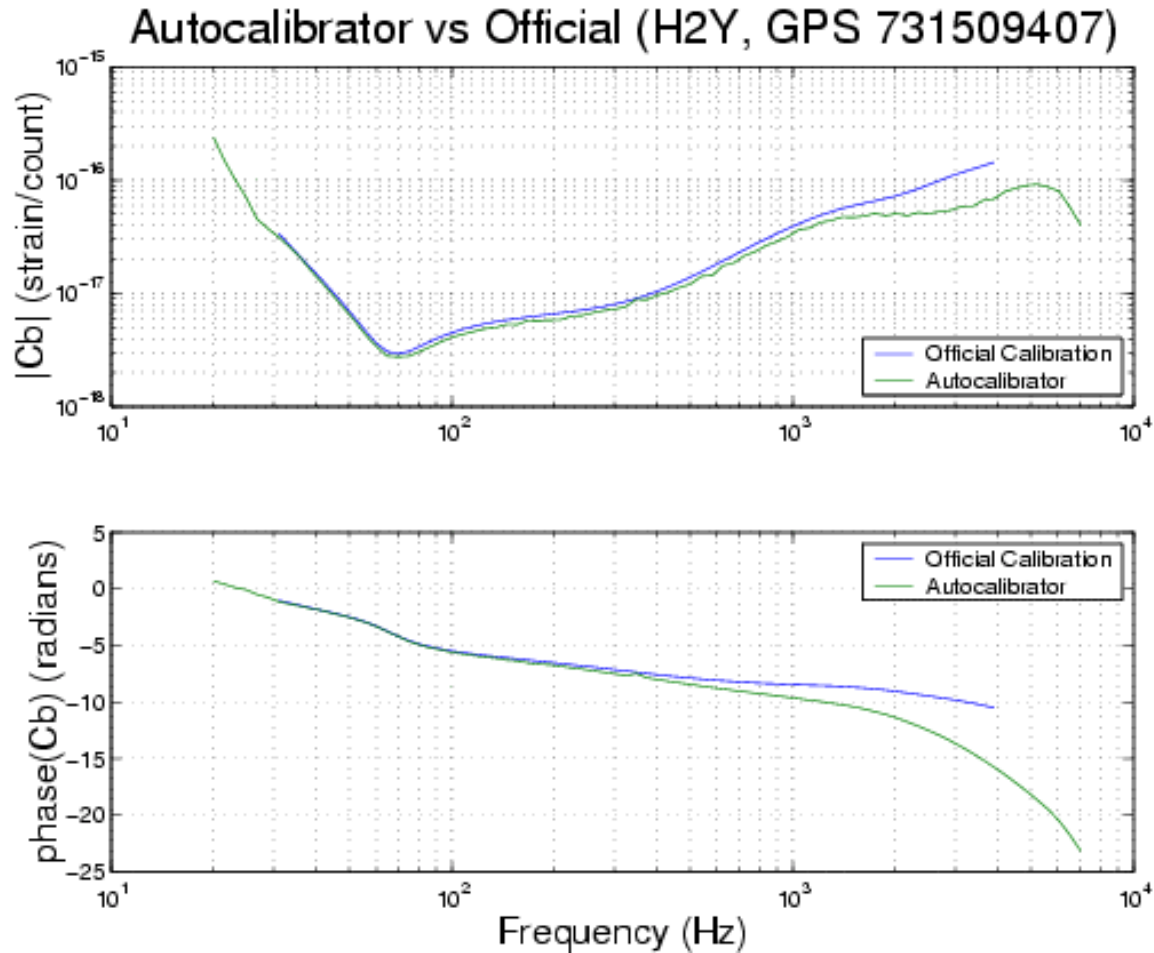
# Ratio: H1 Official/AutoCal



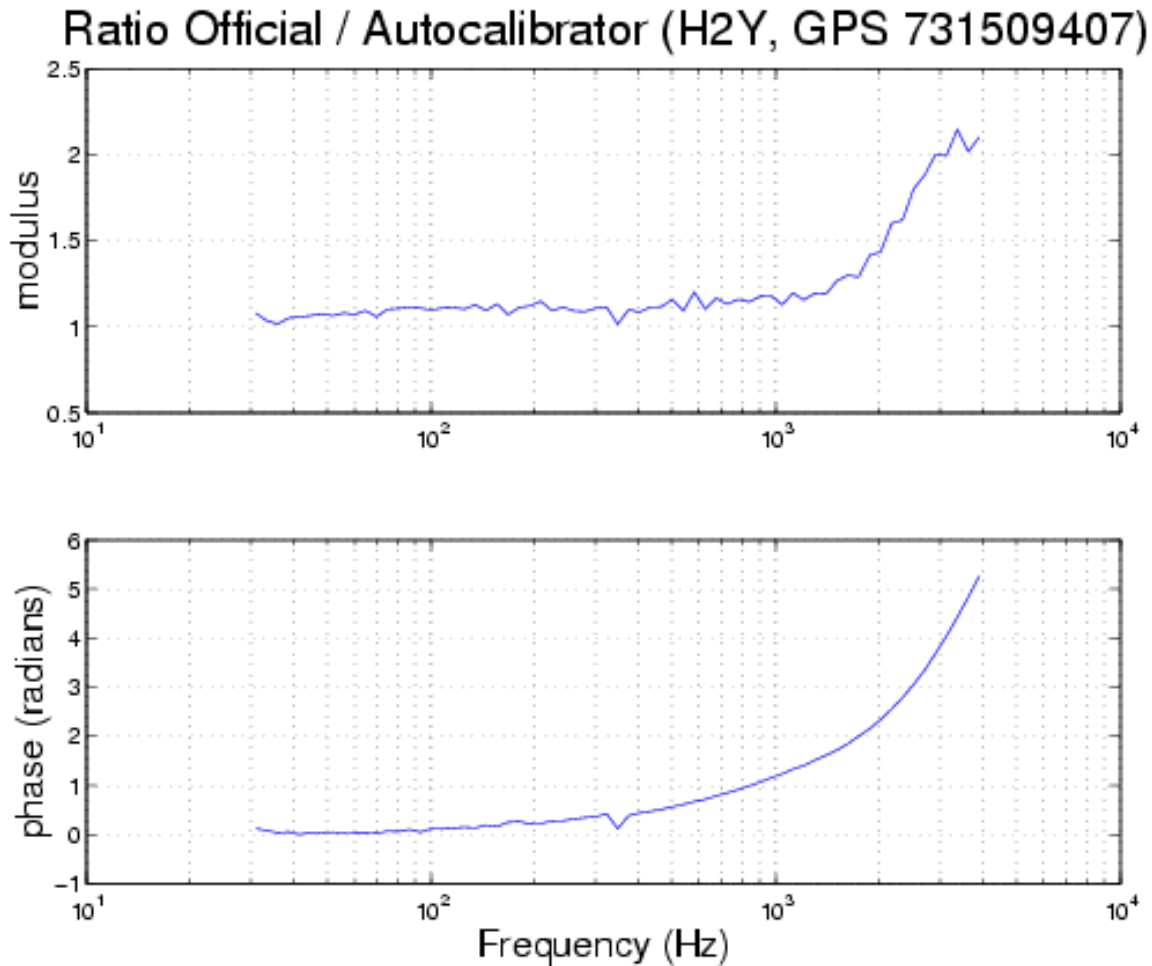
# More H1 Sweeps



# Example: H2

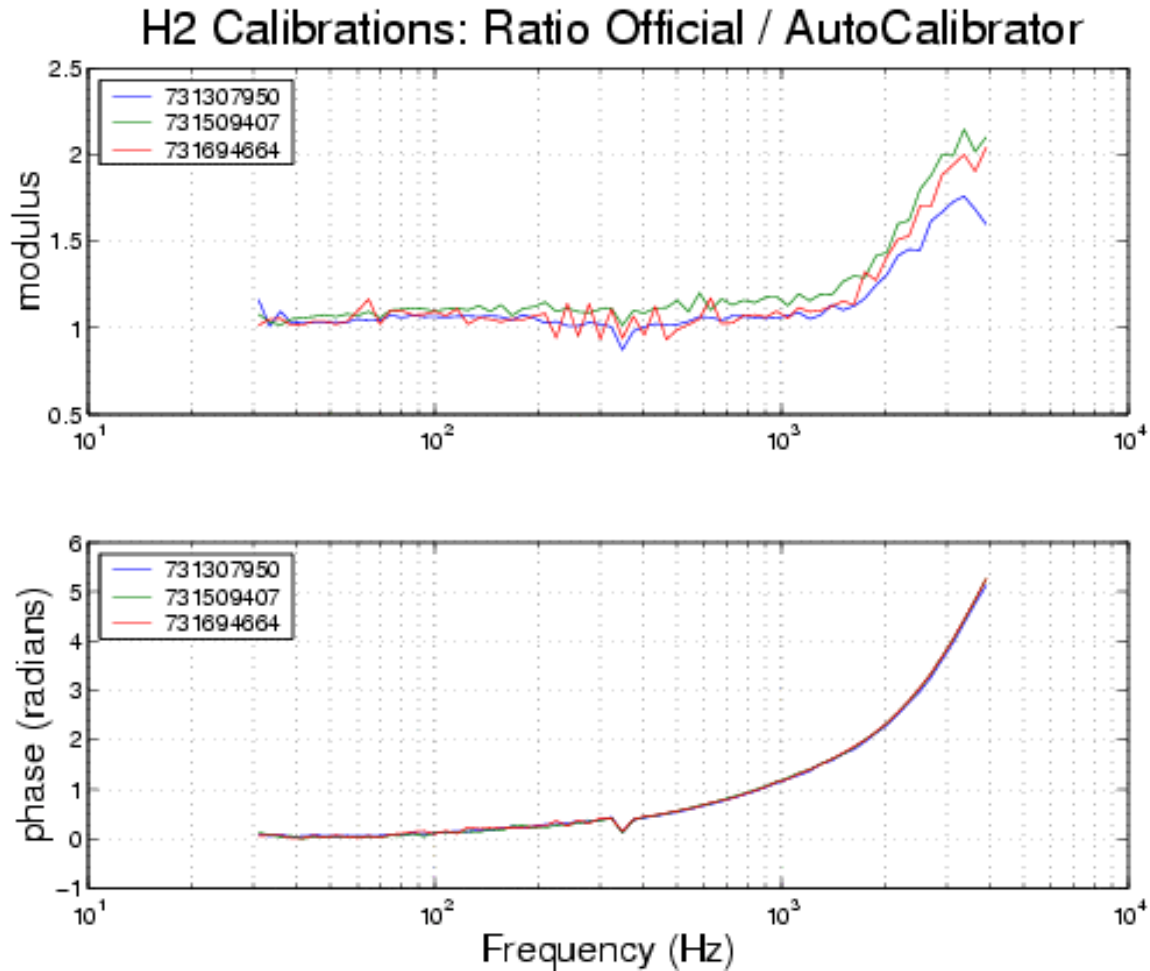


# Ratio: H2 Official/AutoCal

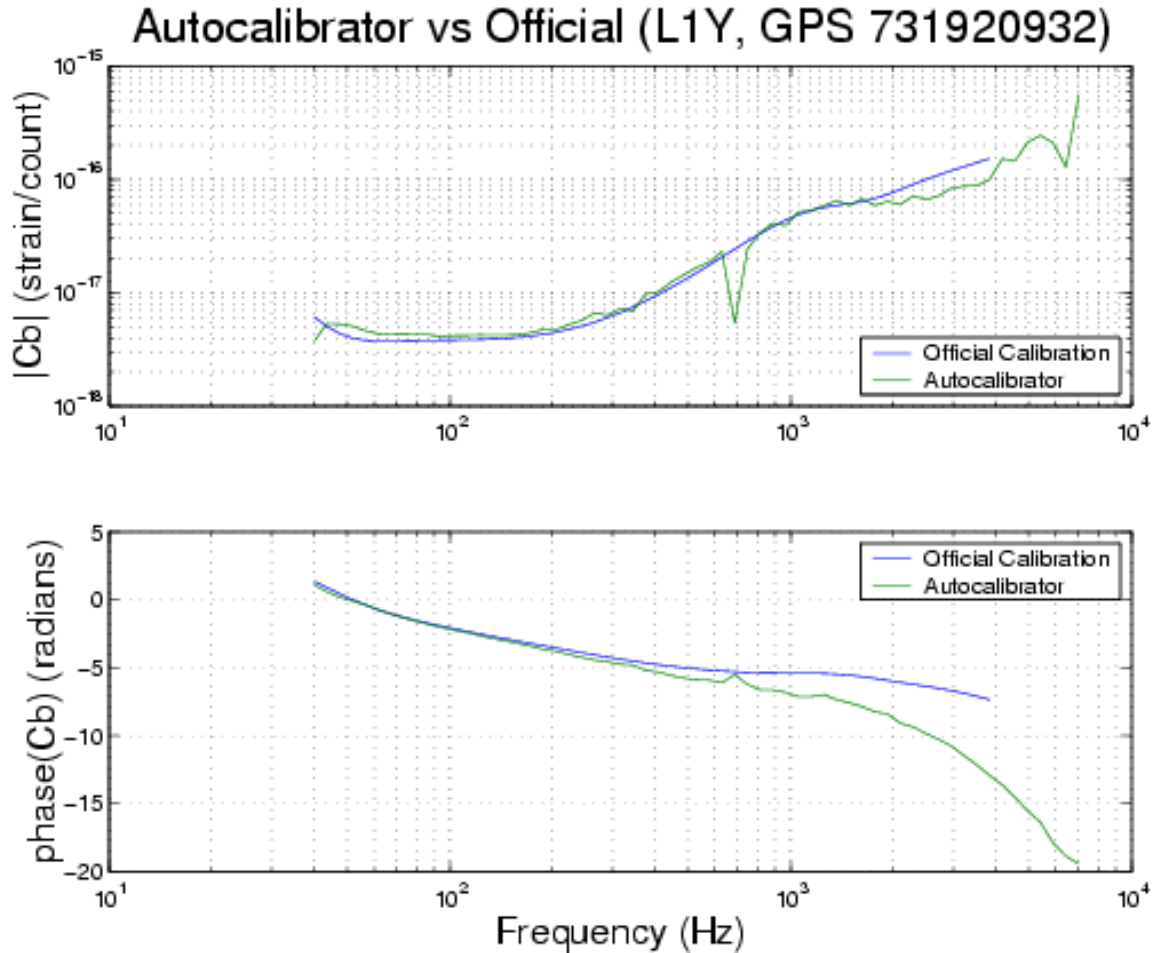




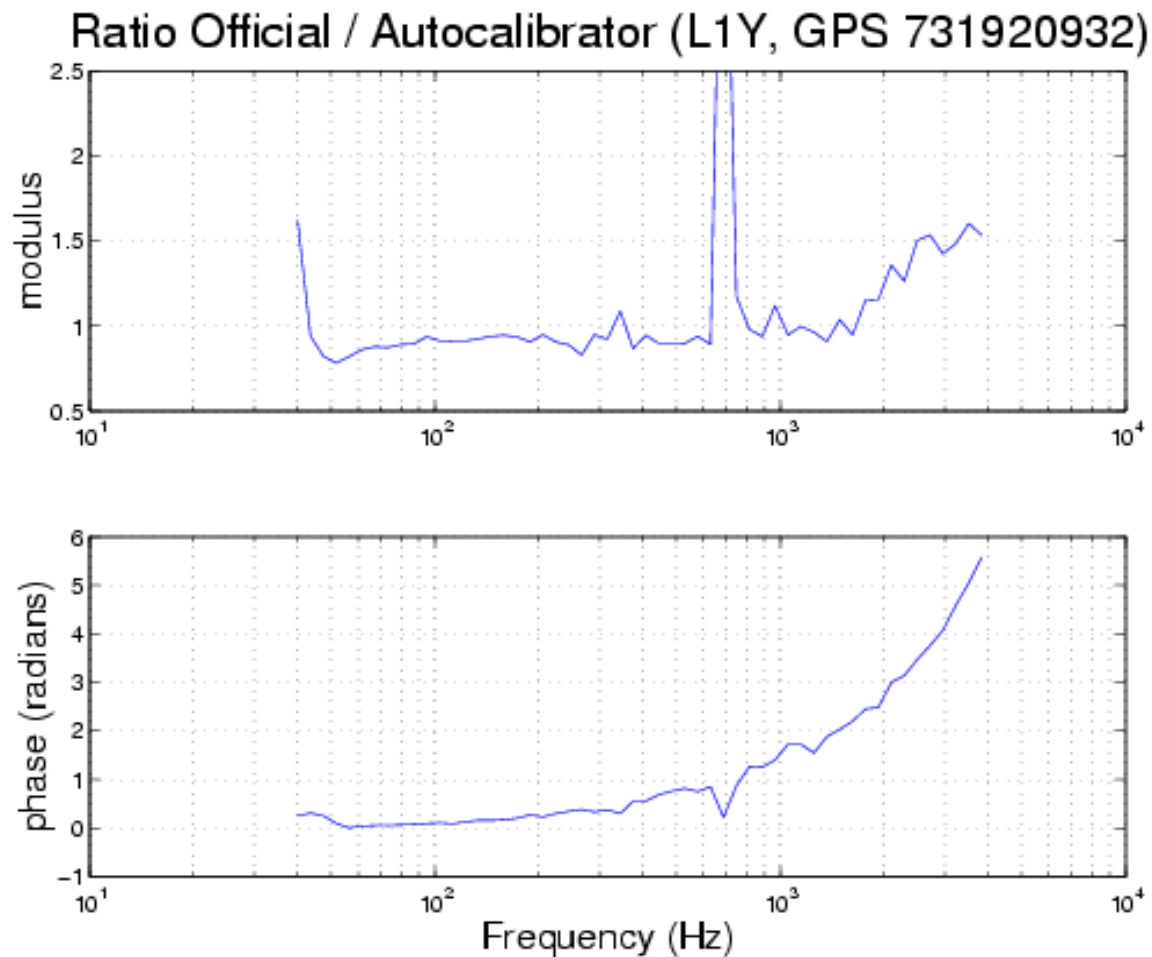
# More H2 Sweeps



# Lonely L1 Example



# Lonely L1 Example



# Summary: Huh?

- ; See very similar discrepancies between Official and AutoCal calibrations in all three IFOs.
- ; Discrepancy increases with frequency. At 2kHz:
  - » Magnitude: 40%
  - » Phase: 2 radians
- ; Source unknown; will require further investigation.