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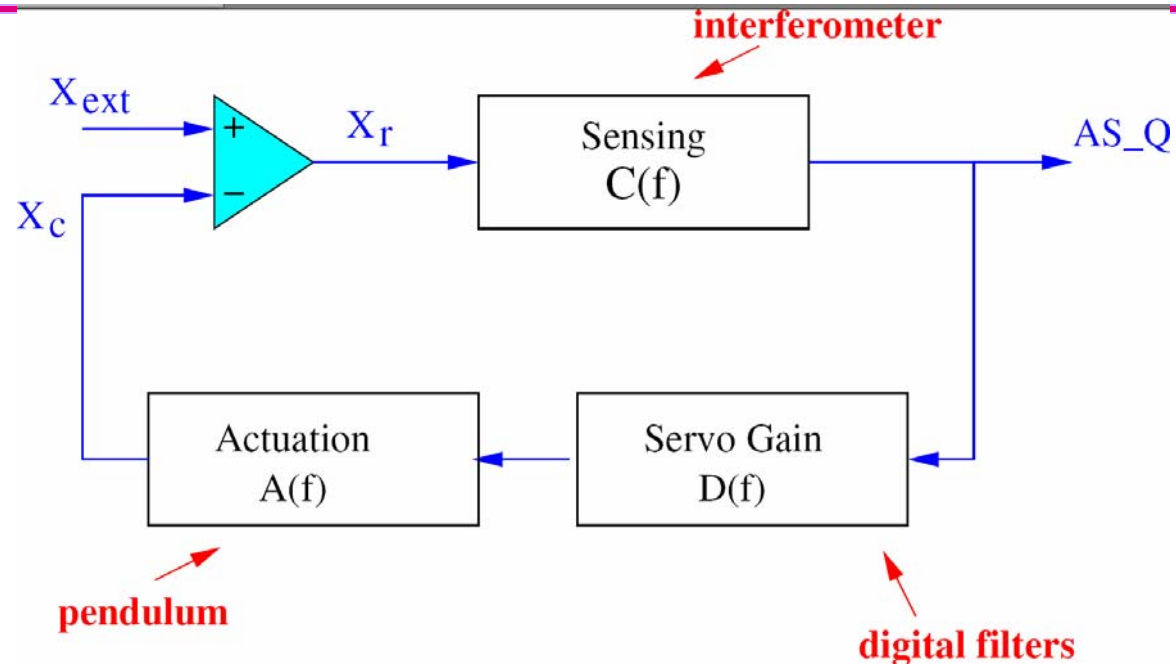
# S2 and S3 calibration status

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Martin Hewitson (GEO)

LSC Meeting  
June 6, 2004  
Tufts University, MA

# IFO review



$$G(f, t) = A(f)(\alpha(t)C(f))(\beta(t)D(f))$$

$$ASQ(f, t) = h(f) \frac{\alpha(t)C(f)}{1 + \alpha(t)\beta(t)G(f)}$$



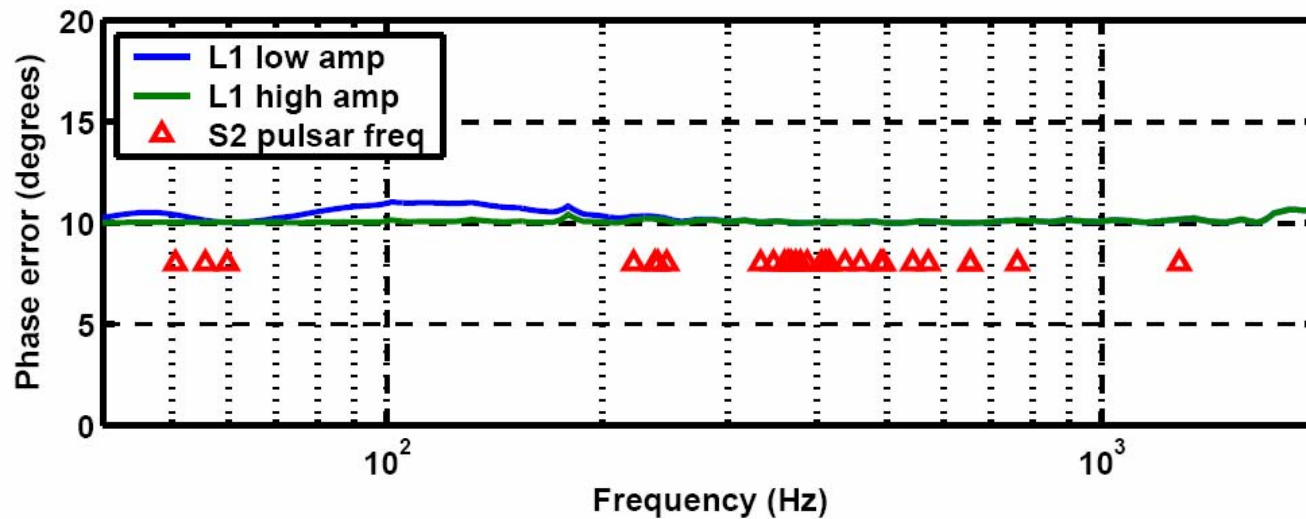
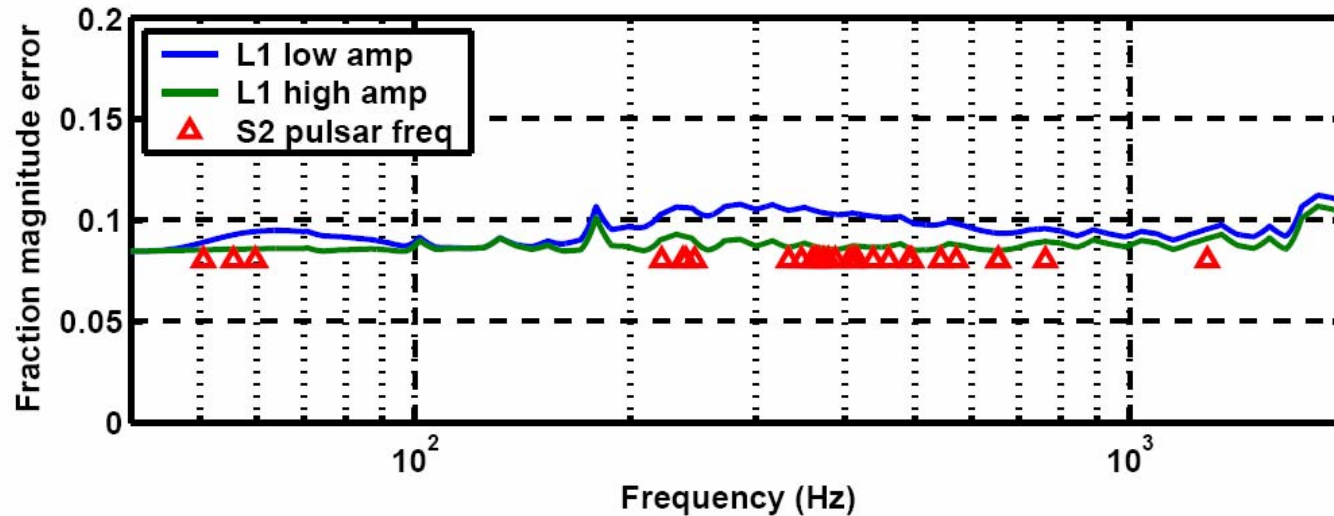
# Outline

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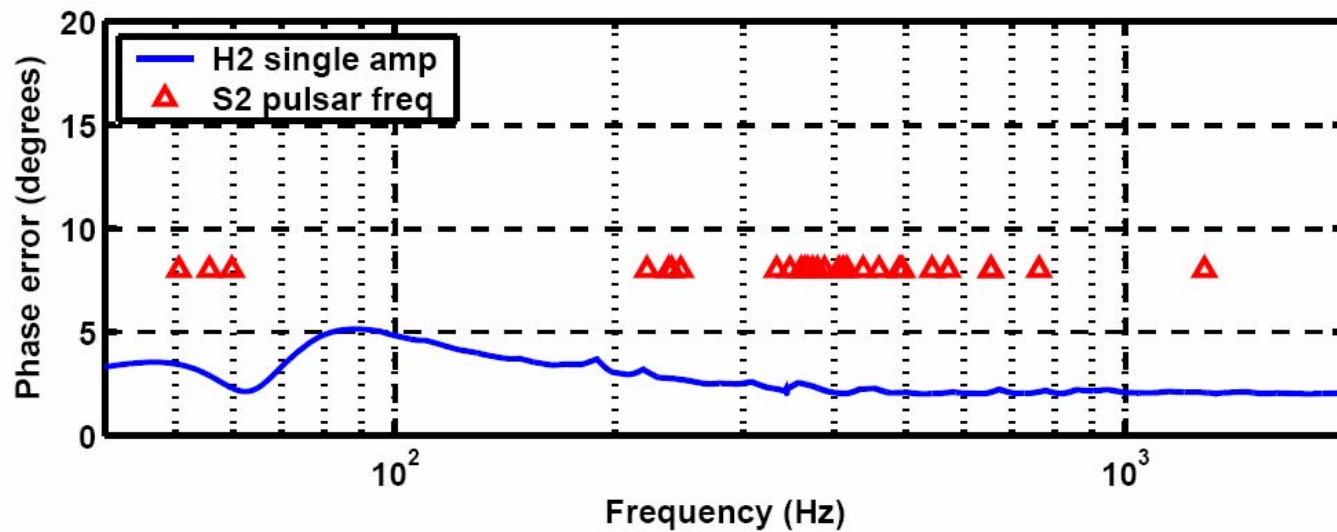
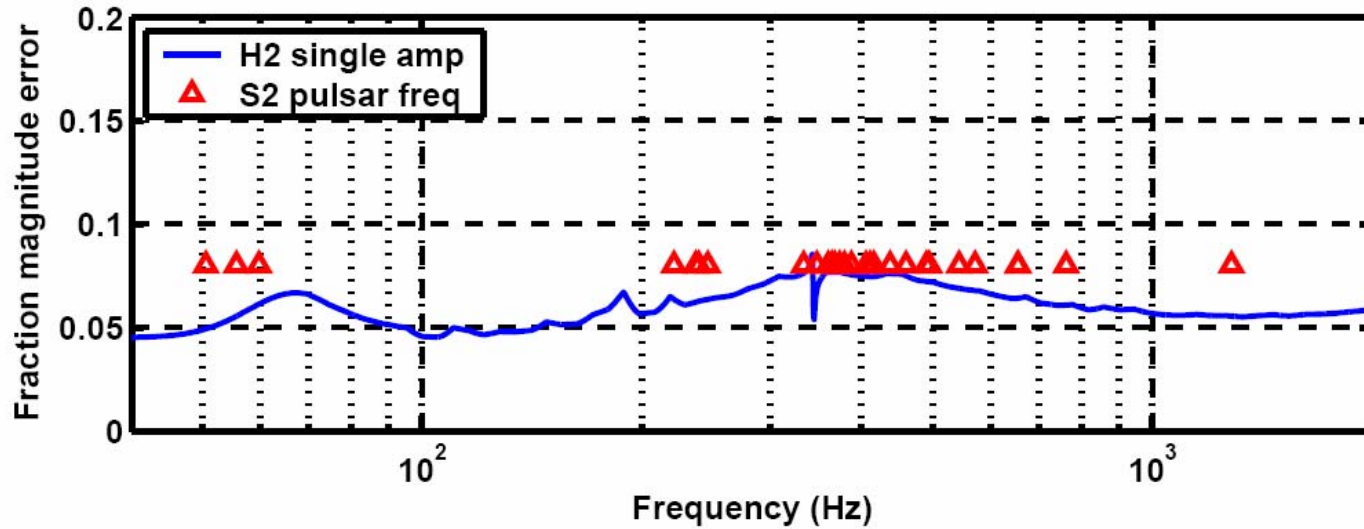
- S2 calibration
  - » Technical document on calibration and errors available at <http://blue.ligo-wa.caltech.edu>, under the Docs section (or, DCC T040060-00.pdf)
  - » Not final, expect some evolution of document (not calibration!). Additional sections on error estimates of alphas and betas, DC cal methods and sign of calibration.
  - » Total calibration error as a function of frequency posted to webpage, too – UL groups will want to assess cal errors for S2 documents
- S3 calibration
  - » V2 calibration issued (super cedes V1.1), corrects a series of problems



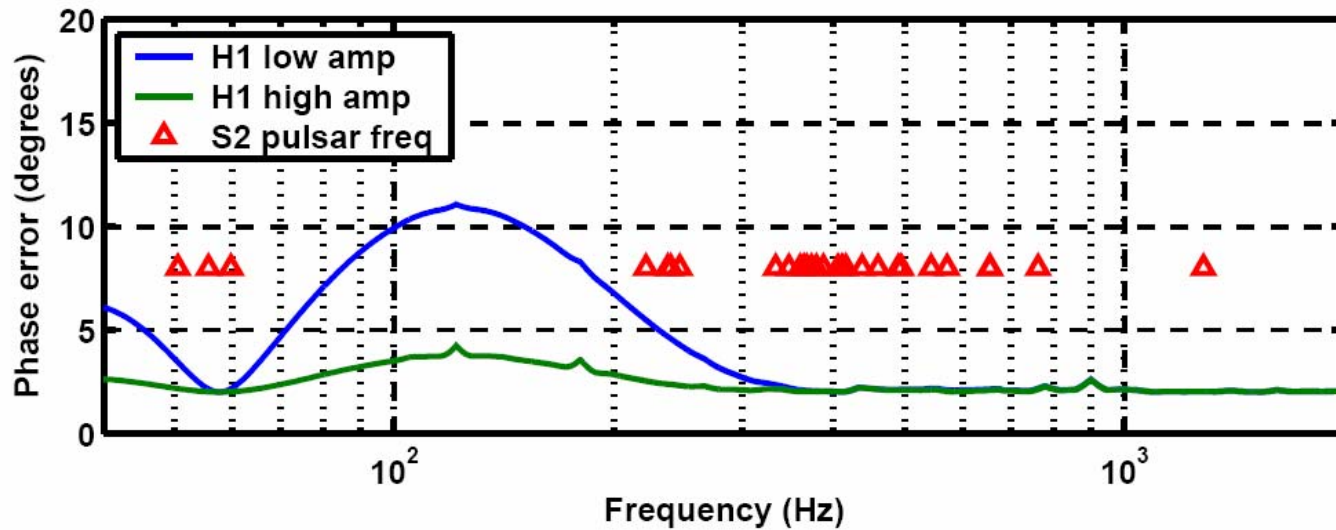
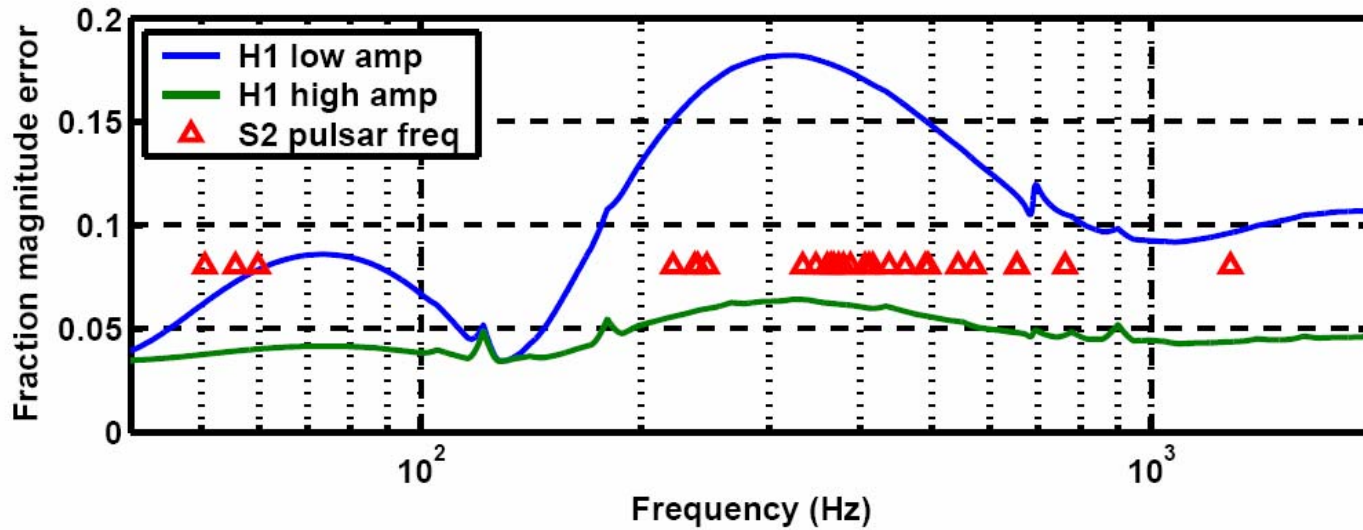
# L1 cal errors, S2 pulsar frequencies



# H2



# H1





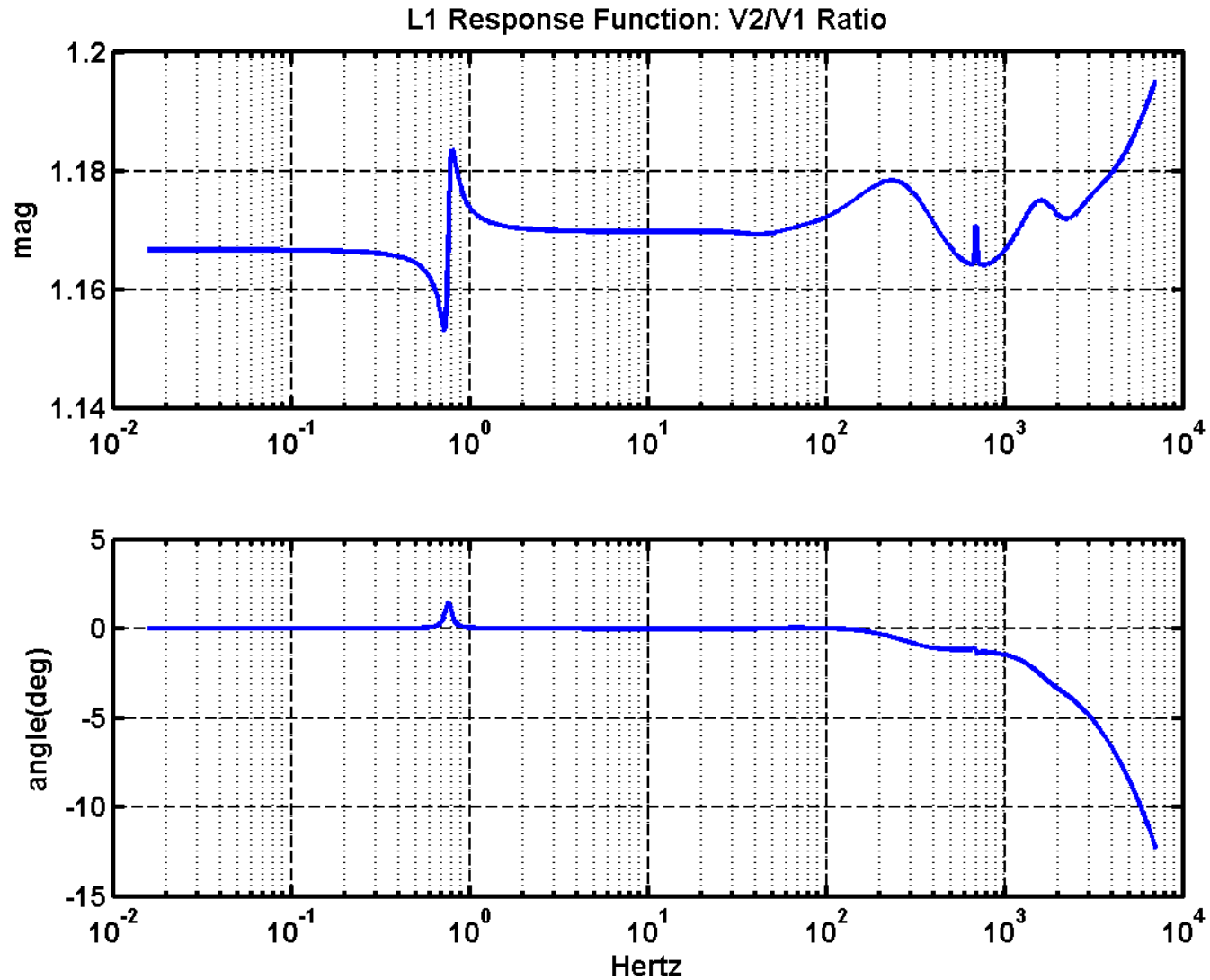
# S3 V2 calibration

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- See
  - » calibration homepage
  - » <http://www.phys.lsu.edu/faculty/gonzalez/S3CalibrationV2/>
- Problems with S3 L1 sensing motivated by i) comparison with X. Siemens' comparison with time domain calibration, and ii) systematics observed in inspiral analysis, relative to Sensemon online
- Two problems with V1.1 S3 cal
  - » Reference functions (L1) (DC gain in sensing, due to the DC gain in the filter and the DC gain in the actuation)
  - » XML versions of cal files (H1, H2)
- New alphas and betas for LHO (took the opportunity of issuing a new calibration to add non-science mode times (injections))
- Autocal comparison
  - » <http://www.ligo-la.caltech.edu/~irish/S2/AutoCalCompare/H1/>
  - » <http://www.ligo-la.caltech.edu/~irish/S2/AutoCalCompare/H2/>
  - » <http://www.ligo-la.caltech.edu/~irish/S2/AutoCalCompare/L1/>



# V2 L1 response function comparison







# Validation

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- CVS archiving: S3 V2 and subsequent calibration versions will be archived
  - » Tag versions for science and engineering runs of: models, data, reference functions and parameter files. Head versions for commissioning use.
  - » Investigating CVS archive at LHO or CIT (space constraints, user accounts)
- Better internal review strategy
- Standardize structure of calibration info in txt files produced at sites
- Request a dedicated Calibration Review Committee



# Afterthoughts

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- S2 publication on calibration to quote in publications
- S3 final calibration: final version likely for early July – feedback?