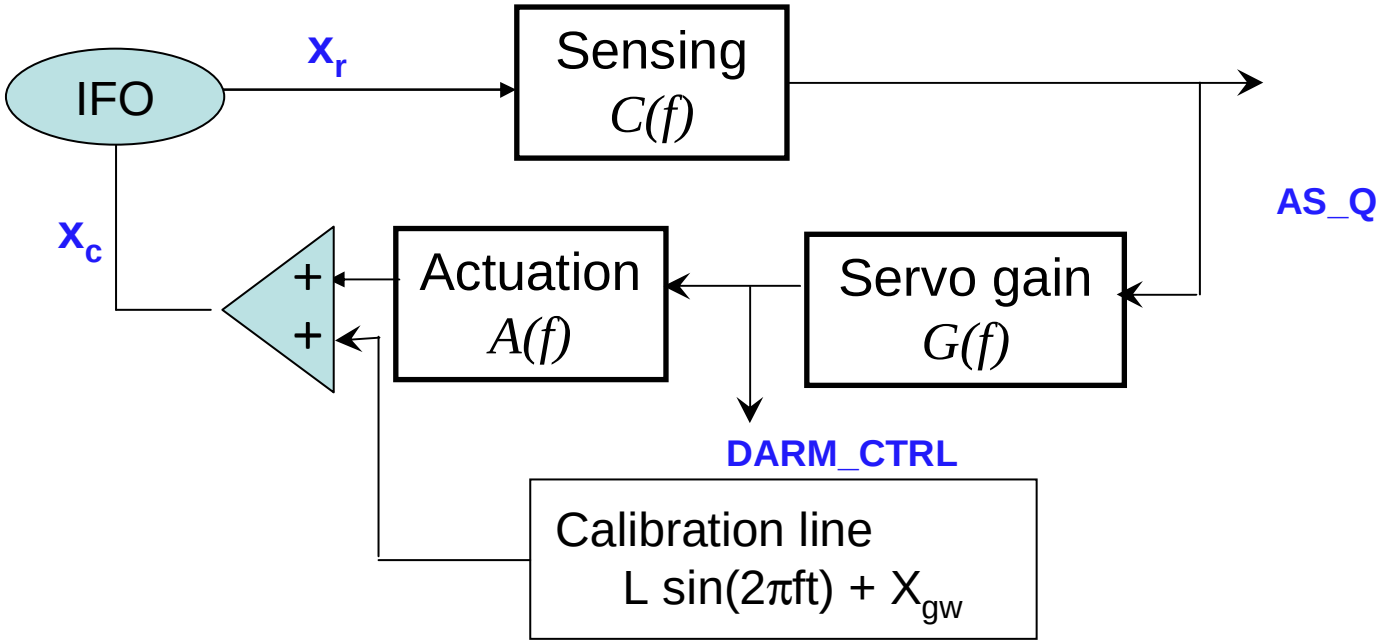
Calibration of S1 data



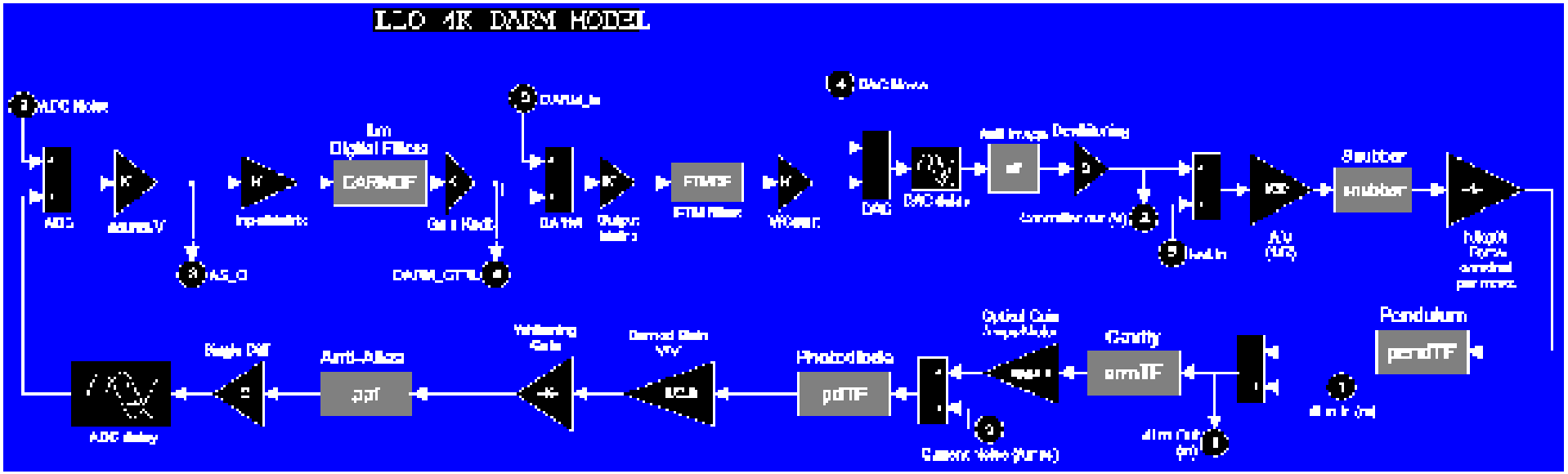
ASQ(f)= X_{gw} C/(1+CAG) = X_{gw} C/(1+H) H= open loop gain

"Response function" is T=C/(1+H), in counts/m or counts/strain
"Calibration function" is 1/T (strain/counts)

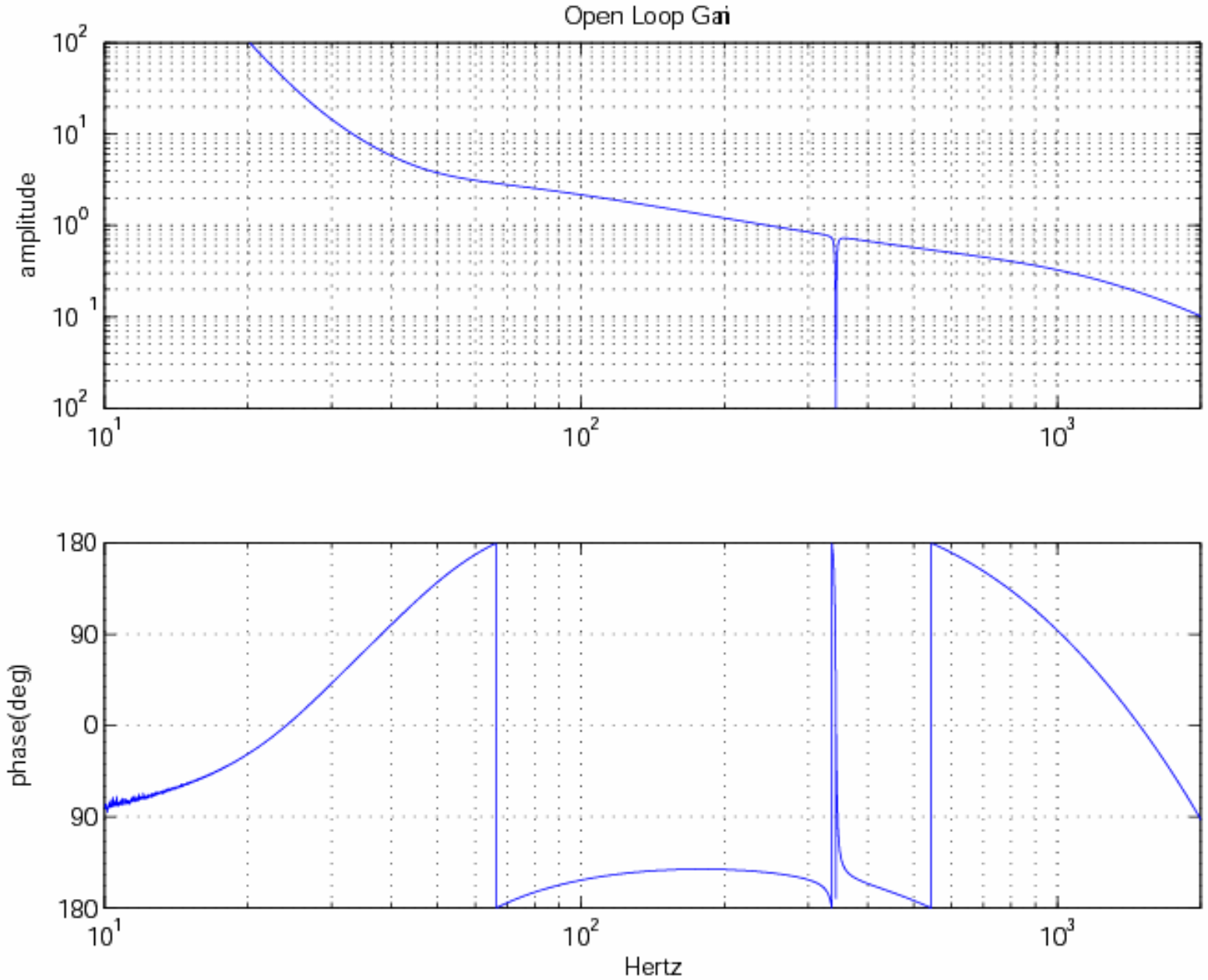
If C$\rightarrow\alpha$ C, then T $\rightarrow\alpha$ C/(1+α H) : not just a factor.

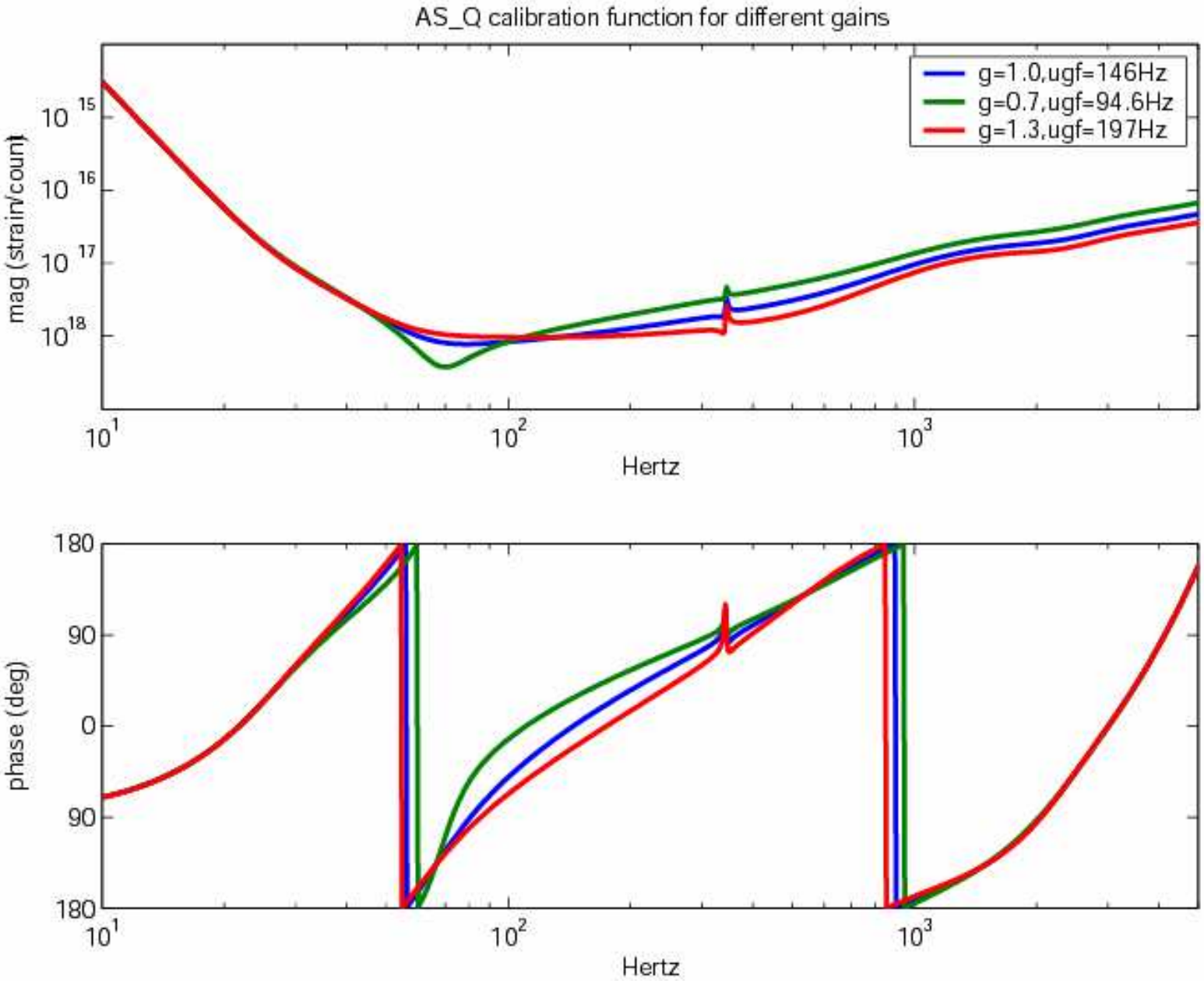
If also C$\rightarrow\alpha$ βC, then T $\rightarrow\alpha$ C/(1+α β H)

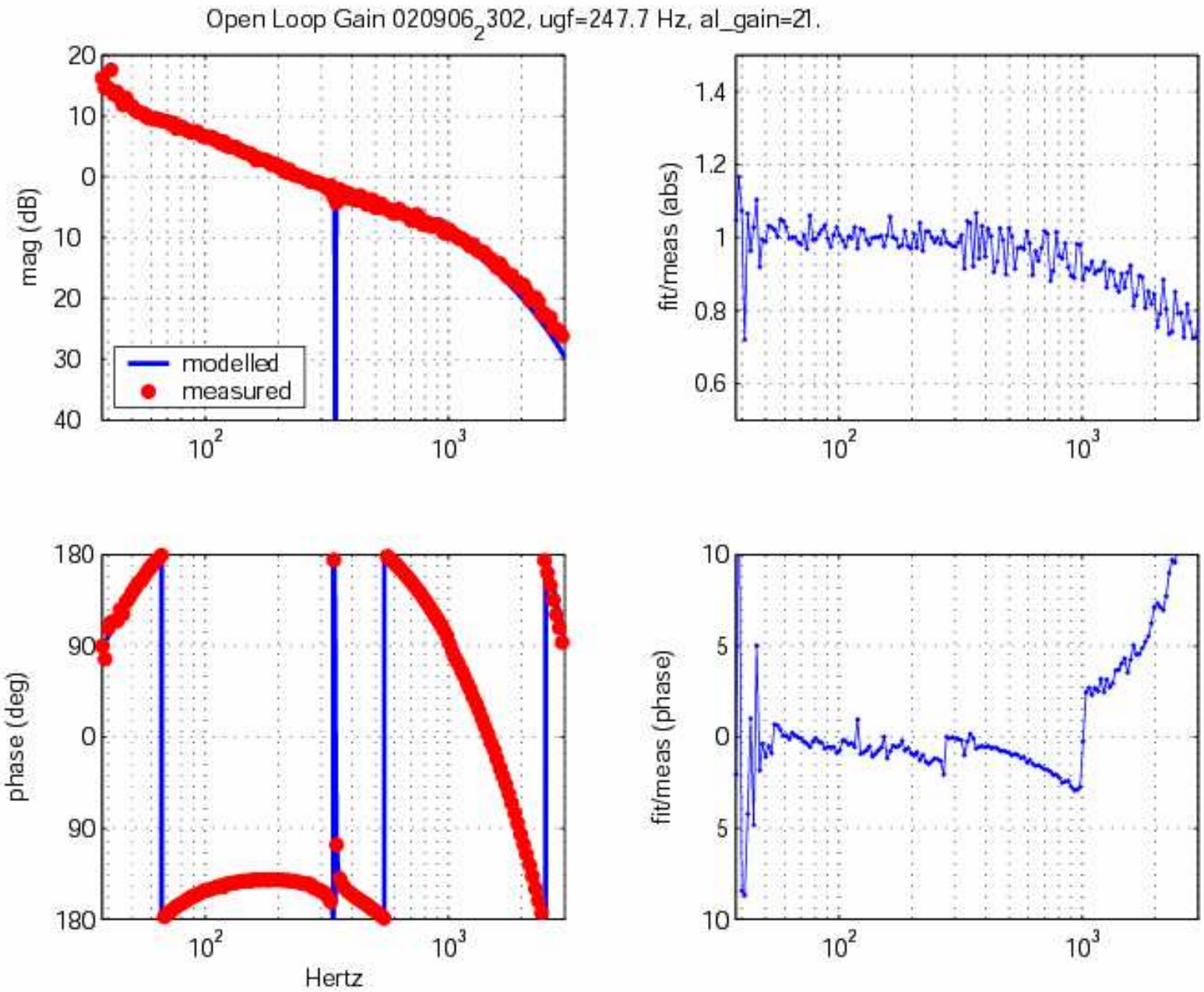
Rana's model for LLO – S1

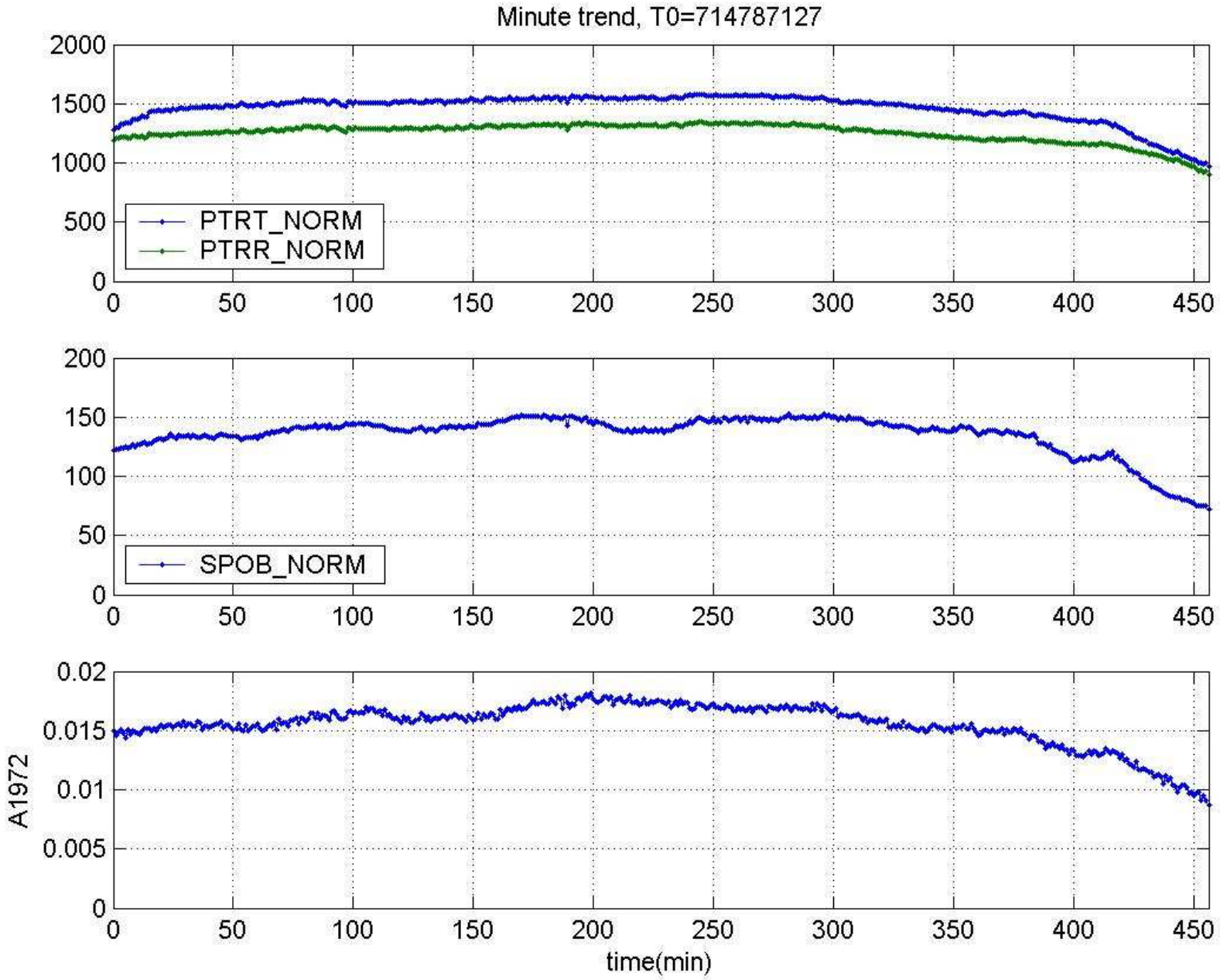


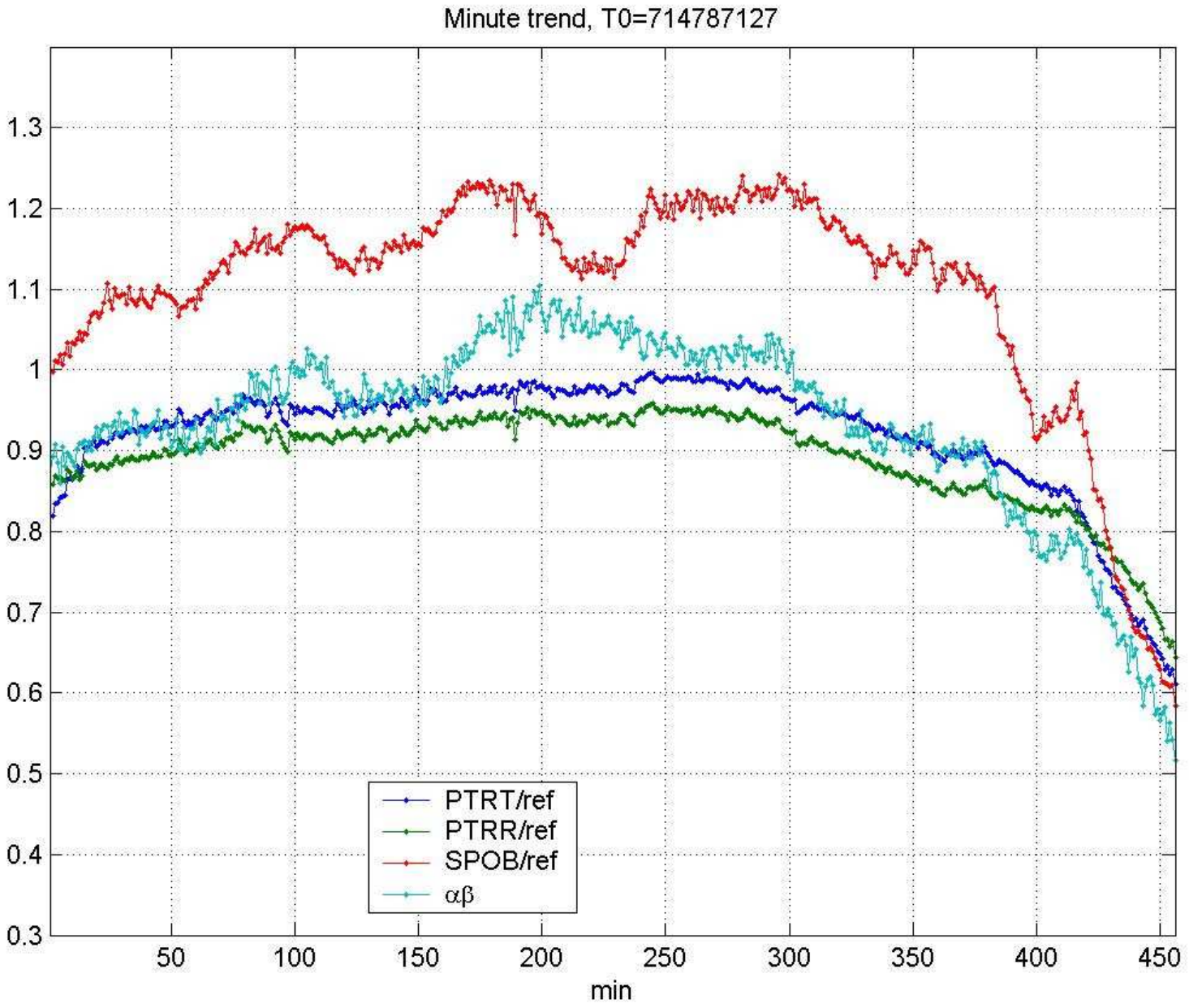
September 6, 2002




AS_Q calibration function for different gains
g=1.0,ugf=146Hz
g=0.7,ugf=94.6Hz
g=1.3,ugf=197Hz
mag (strain/count)
Hertz
phase (deg)
Hertz


Open Loop Gain 020906_2302, ugf=247.7 Hz, al_gain=21.
mag (dB)
modelled
measured
fit/meas (abs)
phase (deg)
Hertz
fit/meas (phase)


Minute trend, T0=714787127
2000
1500
1000
500
0
PTRT_NORM
PTRR_NORM
0
50
100
150
200
250
300
350
400
450
200
150
100
50
0
SPOB_NORM
0
50
100
150
200
250
300
350
400
450
0.02
0.015
0.01
0.005
0
A1972
0
50
100
150
200
250
300
350
400
450
time(min)


Minute trend, T0=714787127
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
50
100
150
200
250
300
350
400
450
min
PTRT/ref
PTRR/ref
SPOB/ref
αβ

In progress:

- use LineMon results to extend calibration vs time to all other segments

- explore the use of the complex response of ASQ to excitation lines:
  demodulate excitation signal from RDS files, and from AS_Q and DARM_CTRL, providing redundant information to prove consistency.

- Better models to extend the calibration fits to higher frequencies, and new S2 systems.