S2 and S3 InterchannelCorrelations

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Detector Characterization Session
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G040148-00-Z

Lots of Microphone Correlations

Correlations between AS_Q and microphones.

Look at H1:LSC-AS_Q/microphone correlations,

as well as H1:LSC-AS_Q/H2:LSC-AS_Q correlations.

Data Presented: 20, 000 s during lock, 0.01 Hz Bandwidth
200 Averages

S3 LHO correlation results can be found at:
http://physics.carleton.edu/Research/ligo/H1mics/S3H1MicsCorr.html

S3 LLO correlation results can be found at:
http://physics.carleton.edu/Research/ligo/S3LLO/S3-LLO-Corr.html

H1:LSC-AS_Q / Microphone Correlations: Largest Signal Location

2 Hz: PSL2 and HAM7, Coherence of 0.19

4 Hz: HAM1 and BSC7, Coherence of 0.14

5 Hz: HAM7 and PSL2, Coherence of 0.28

5.5 to 6.5 Hz: BSC10 (End Y), Coherence of 0.2

10 Hz: BSC1, LVEA, PSL1, HAM1, ISCT1, Coh of 0.27

12.5 Hz: HAM7, Coherence of 0.24

14 Hz: BSC10, Coherence of 0.19

18 Hz: LVEA, Coherence of 0.19

20 Hz: BSC1, PSL2,ISCT1, ISCT4, Coherence of 0.24

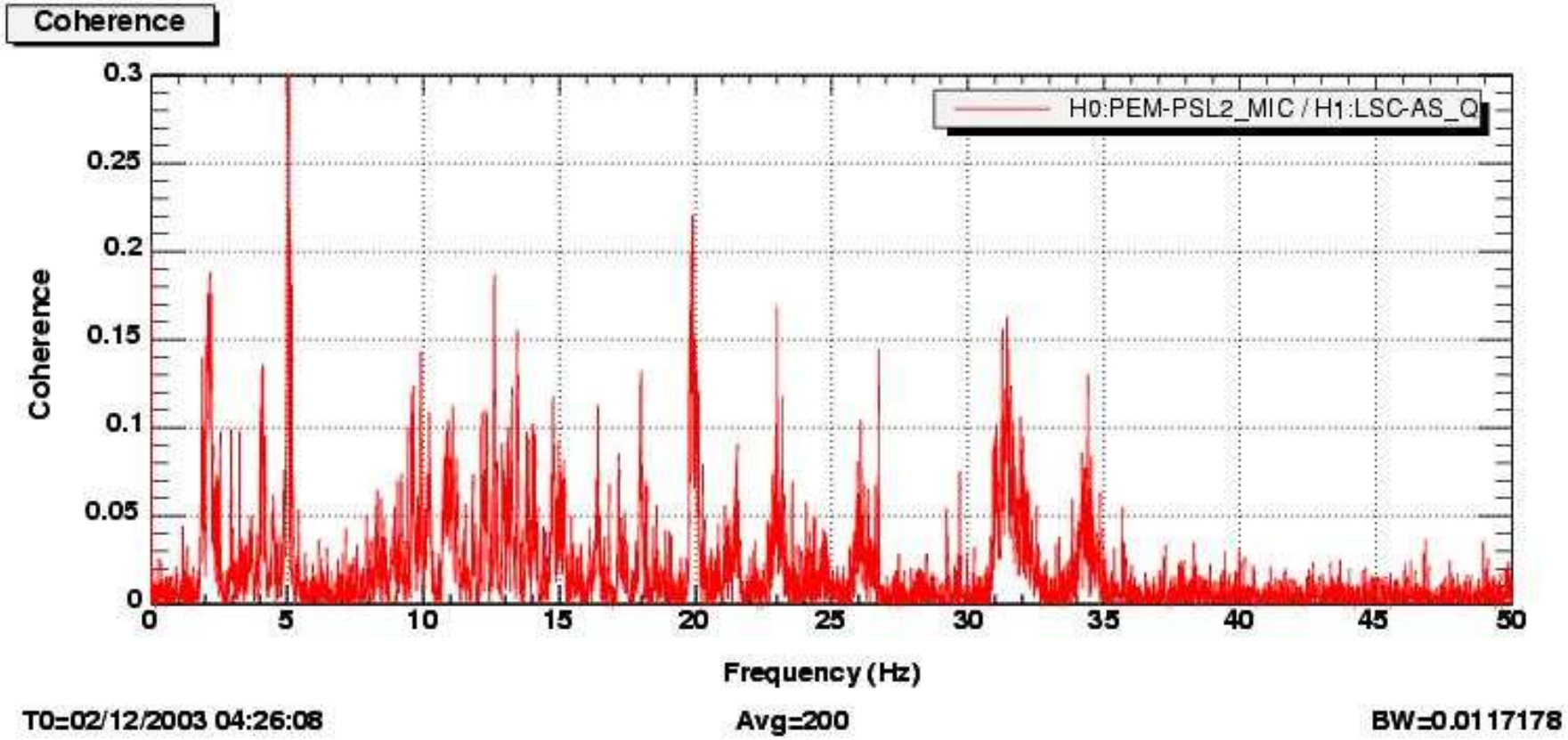
21.1 Hz: BSC1, BSC7, LVEA, ISCT4, Coherence of 0.24

23.5 Hz: PSL1, Coherence of 0.21

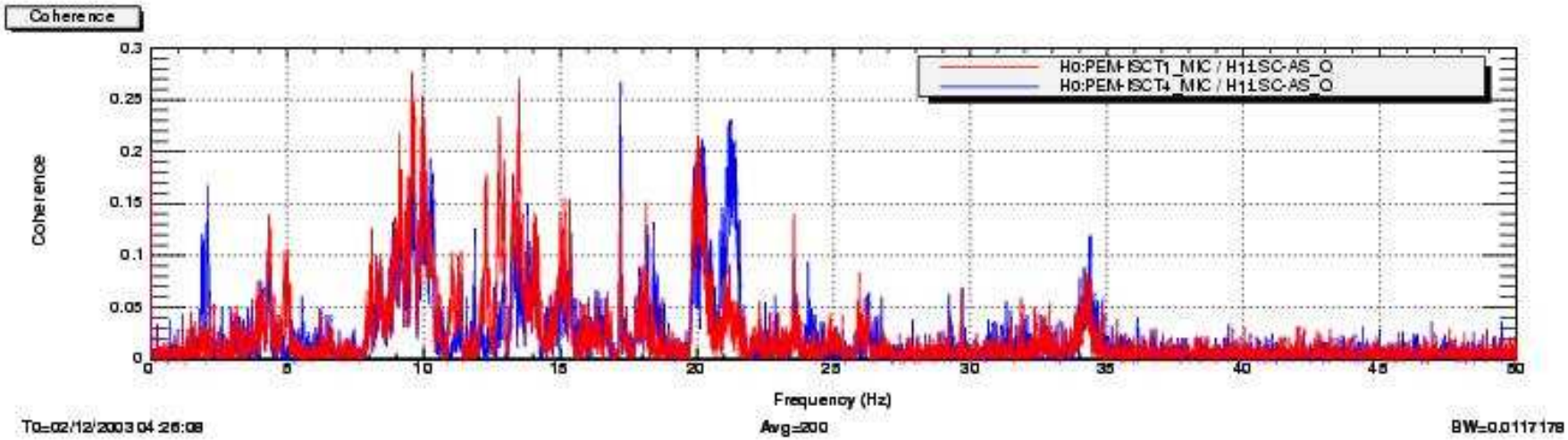
31.4 Hz: PSL2, Coherence of 0.16

34.4 Hz: BSC1, PSL2, LVEA, ISCT4, Coherence of 0.13

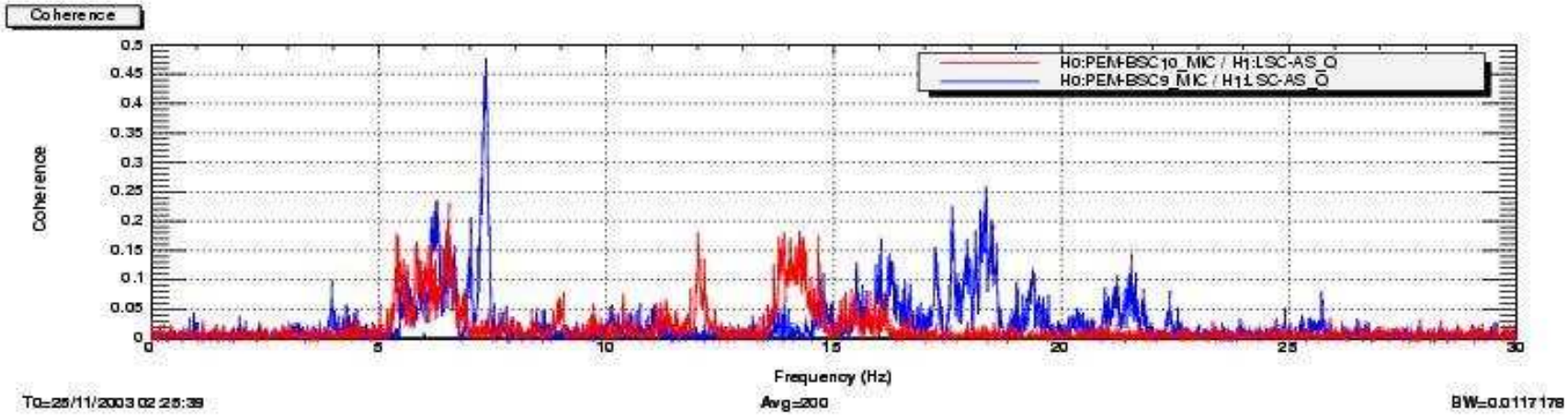
Low Frequency Correlations: H1:LSC-AS_Q and H0:PEM-PSL2_MIC



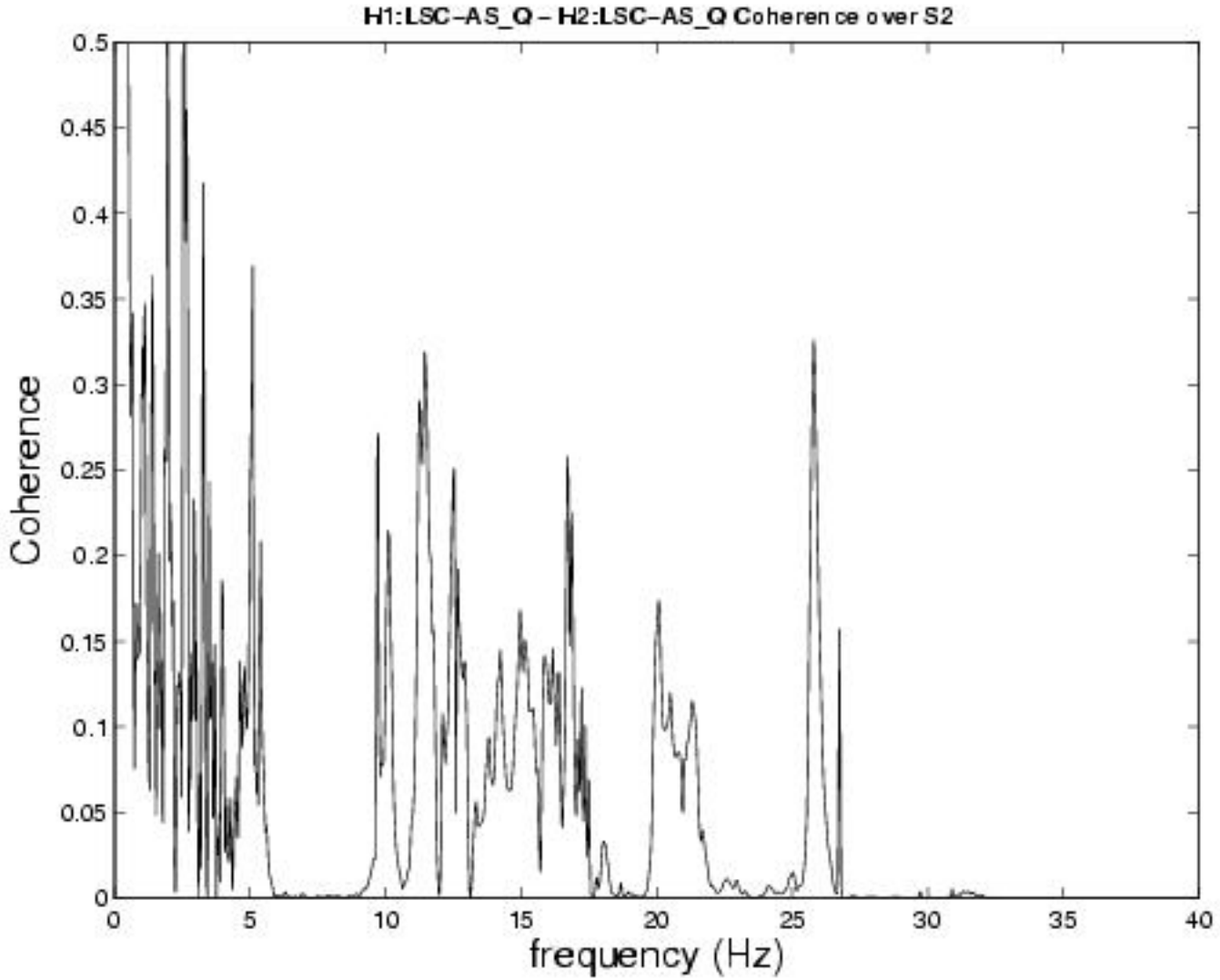
Low frequency H1:LSC-AS_Q Correlations with MICs at ISCT1 and ISCT4



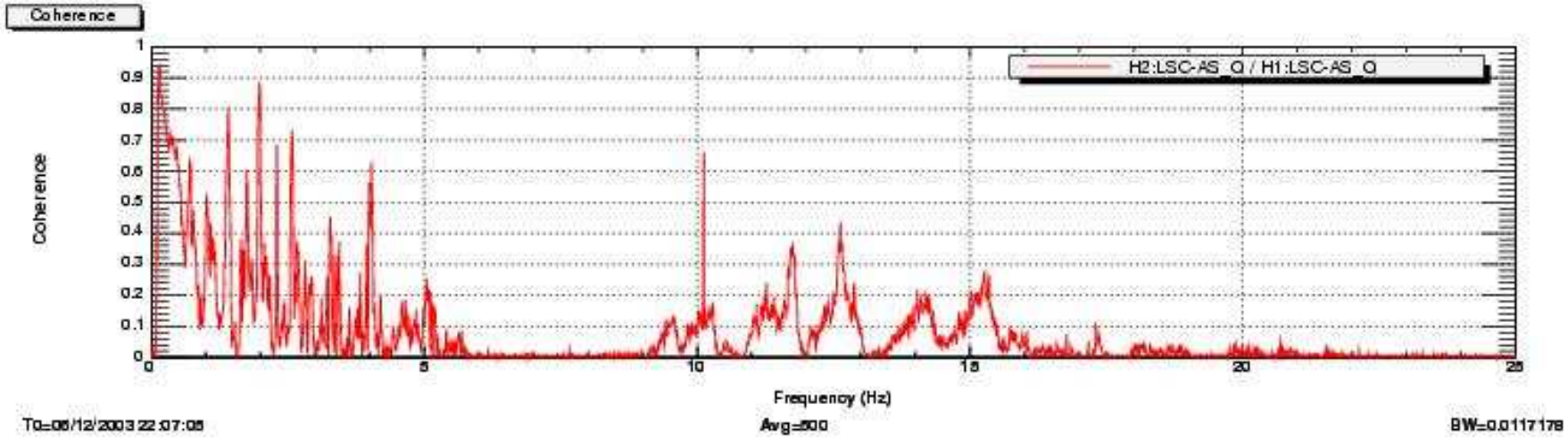
H1:LSC-AS_Q Correlations with MICs at BSC9 (X end) and BSC10 (Y end) at low frequencies



S2 Correlations H1:LSC-AS_Q and H2:LSC-AS_Q from Stochastic



S3 Correlations H1:LSC-AS_Q – H2:LSC-AS_Q, some still at low frequency, but others above 15 Hz are gone.



H1:LSC-AS_Q / Microphone Correlations: Largest Signal Location

47 Hz: BSC9 (end X), Coherence of 0.4

55.5 Hz: PSL2, HAM7, Coh 0.5

55.7 Hz ISTC4 Coherence 0.5

58.9 Hz: BSC10 (end Y), Coherence of 0.1

59.3 Hz: HAM7, PSL2, ISCT1 and ISCT4, Coherence of 0.5

70.3 Hz, 71.3 Hz, 71.6 Hz, 71.8 Hz, HAM1 and PSL1, Coherence of 0.06

105.5 Hz: ISCT1, PSL1, HAM1, Coherence of 0.08

106.6 Hz: BSC10, Coh. of 0.1

107.7 ISCT1 Coh 0.12

133.5 Hz: PSL1 and HAM1, Coherence of 0.06

173.5 Hz: PSL1, Coherence of 0.15

202.8 Hz: BSC7, Coherence of 0.04

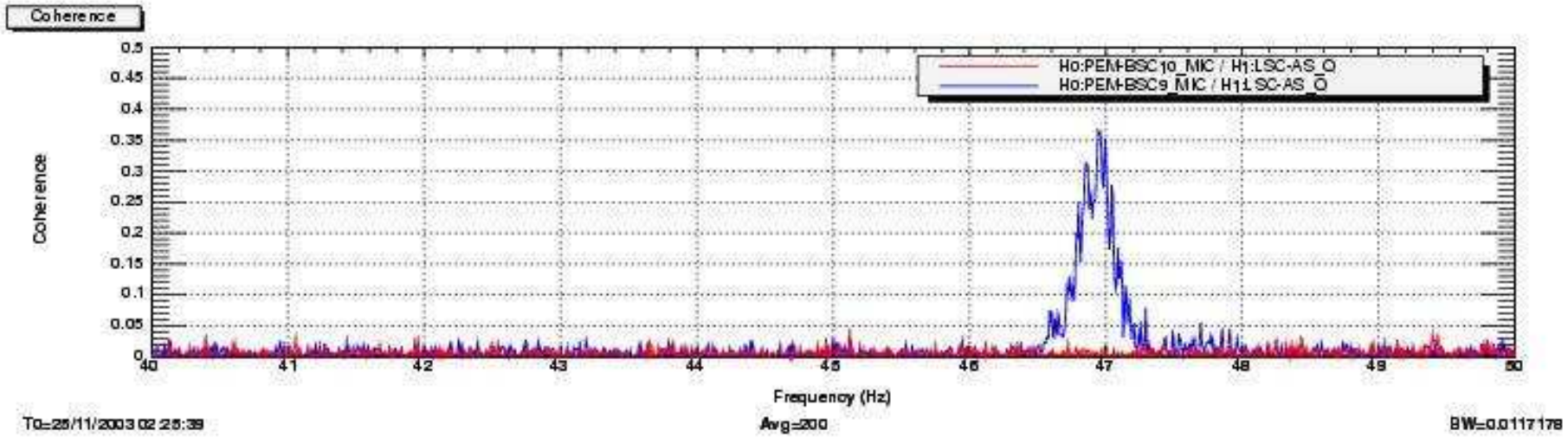
205.2 Hz: BSC7, Coherence of 0.05

212 Hz: PSL1, Coherence of 0.1

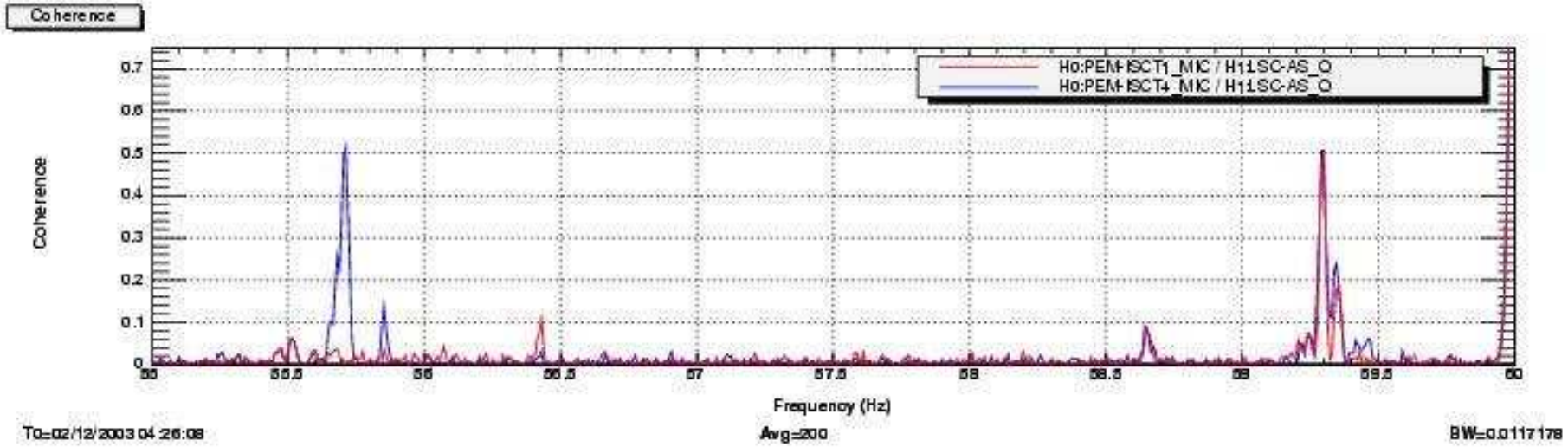
226.9 Hz: PSL1, Coherence of 0.3

267, 277, 279, 281 and 296 Hz in ISCT1, HAM1 and PSL1, Cor~0.7

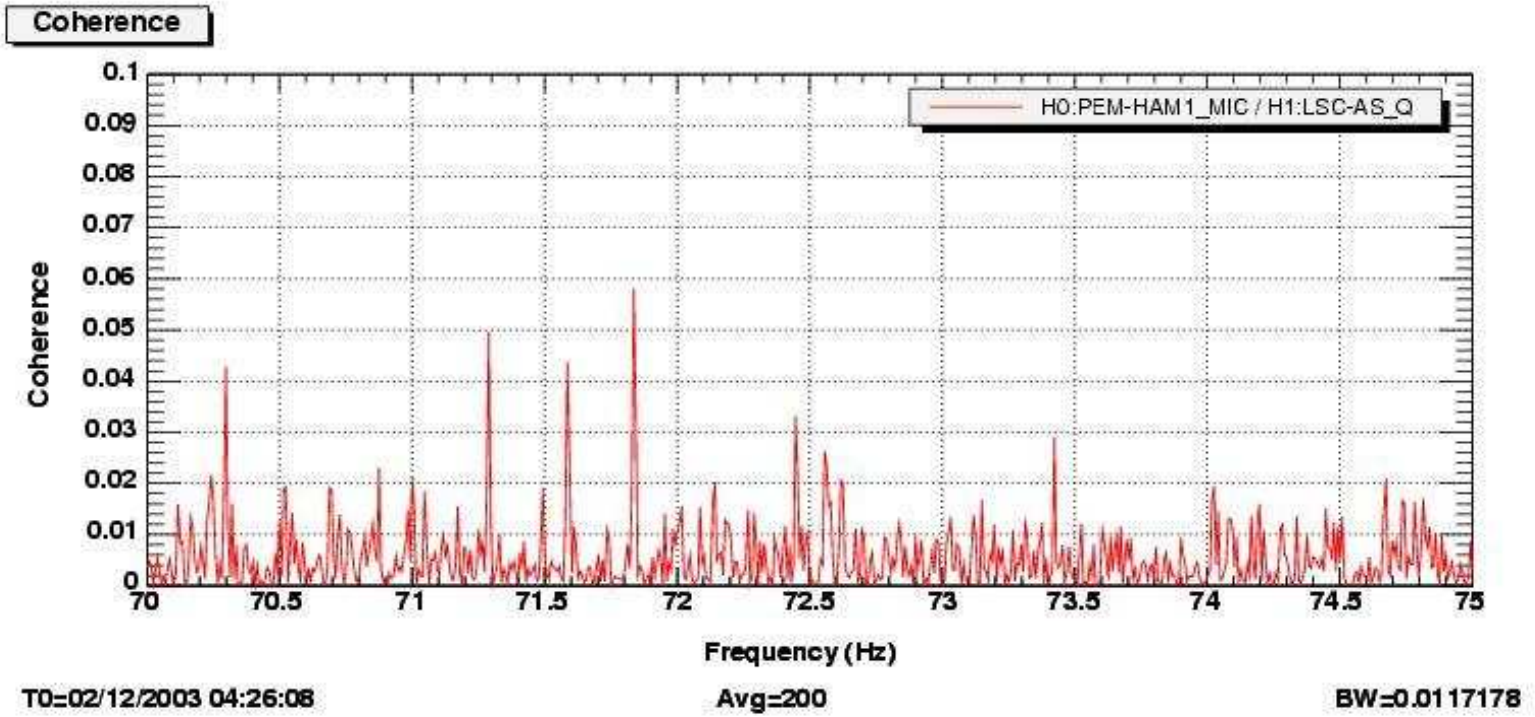
47 Hz Correlation between H1:LSC-AS_Q and MIC at BSC9 (X end)



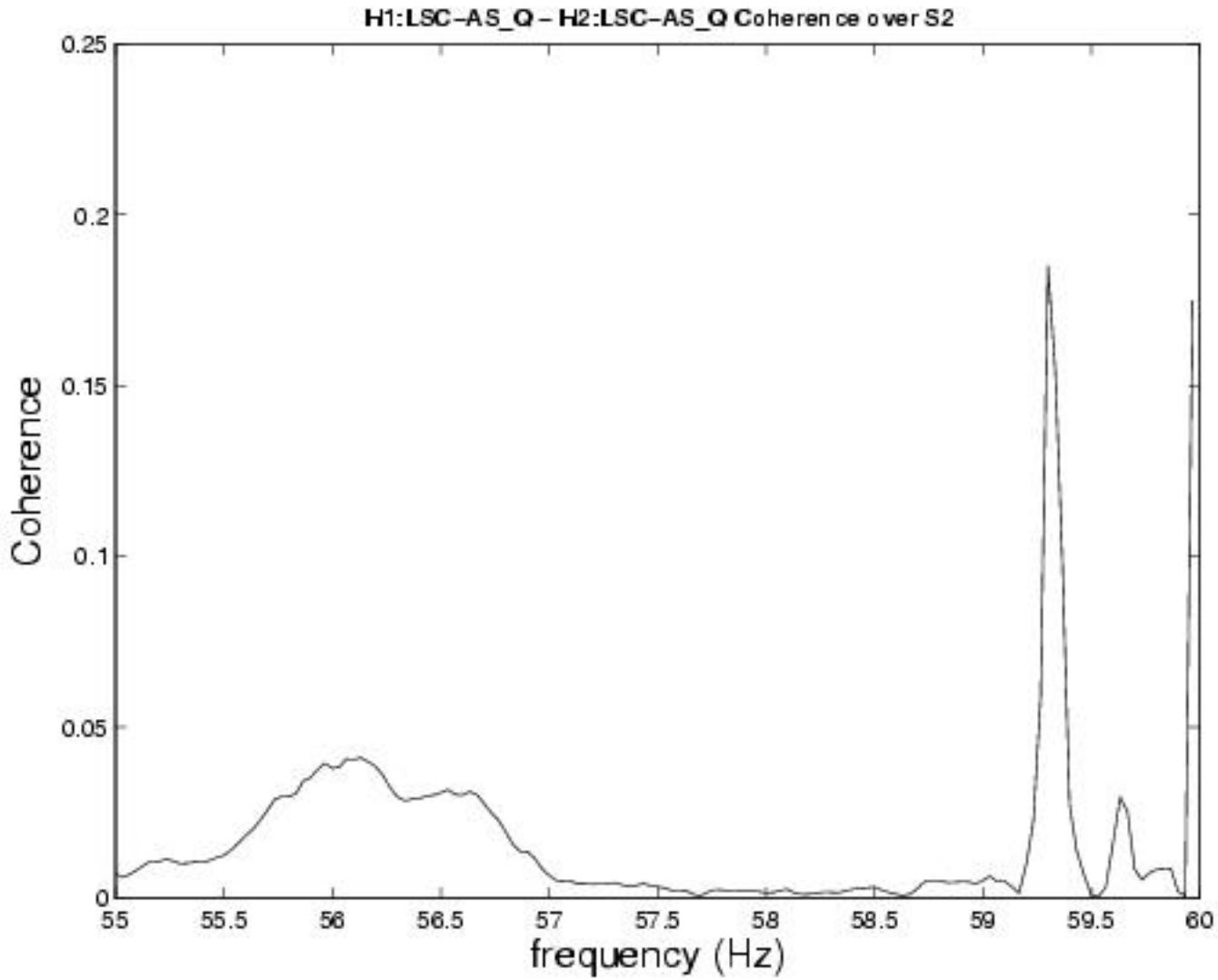
LHO Correlations
H1:LSC-AS_Q/ISCT1 and ISCT4
MICs at 55.7 and 59.3 Hz



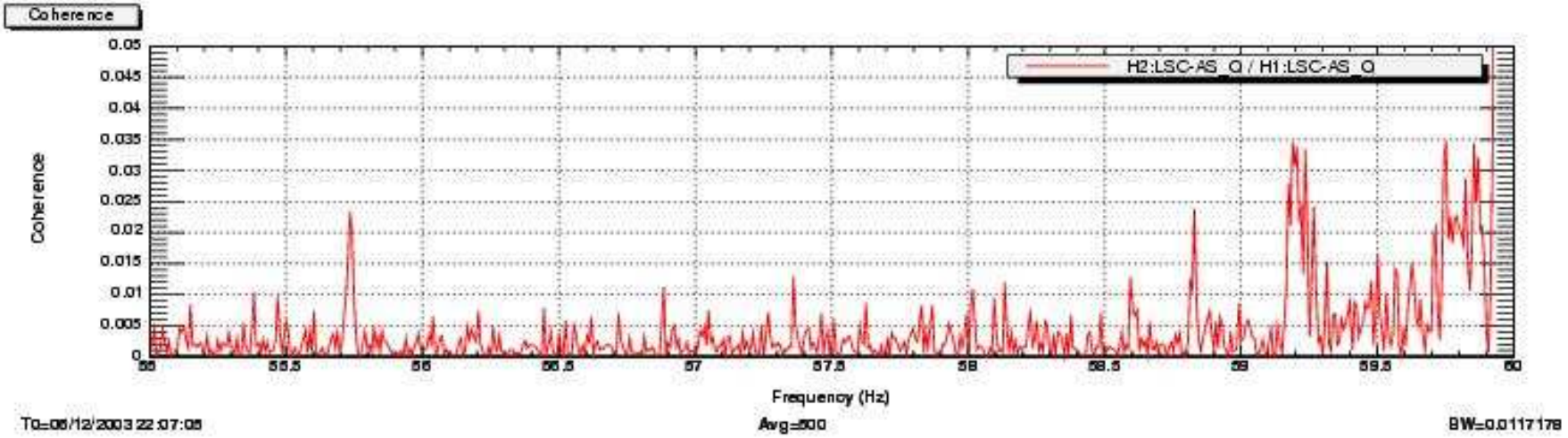
H1:LSC-AS_Q/HAM1_MICS around 72 Hz



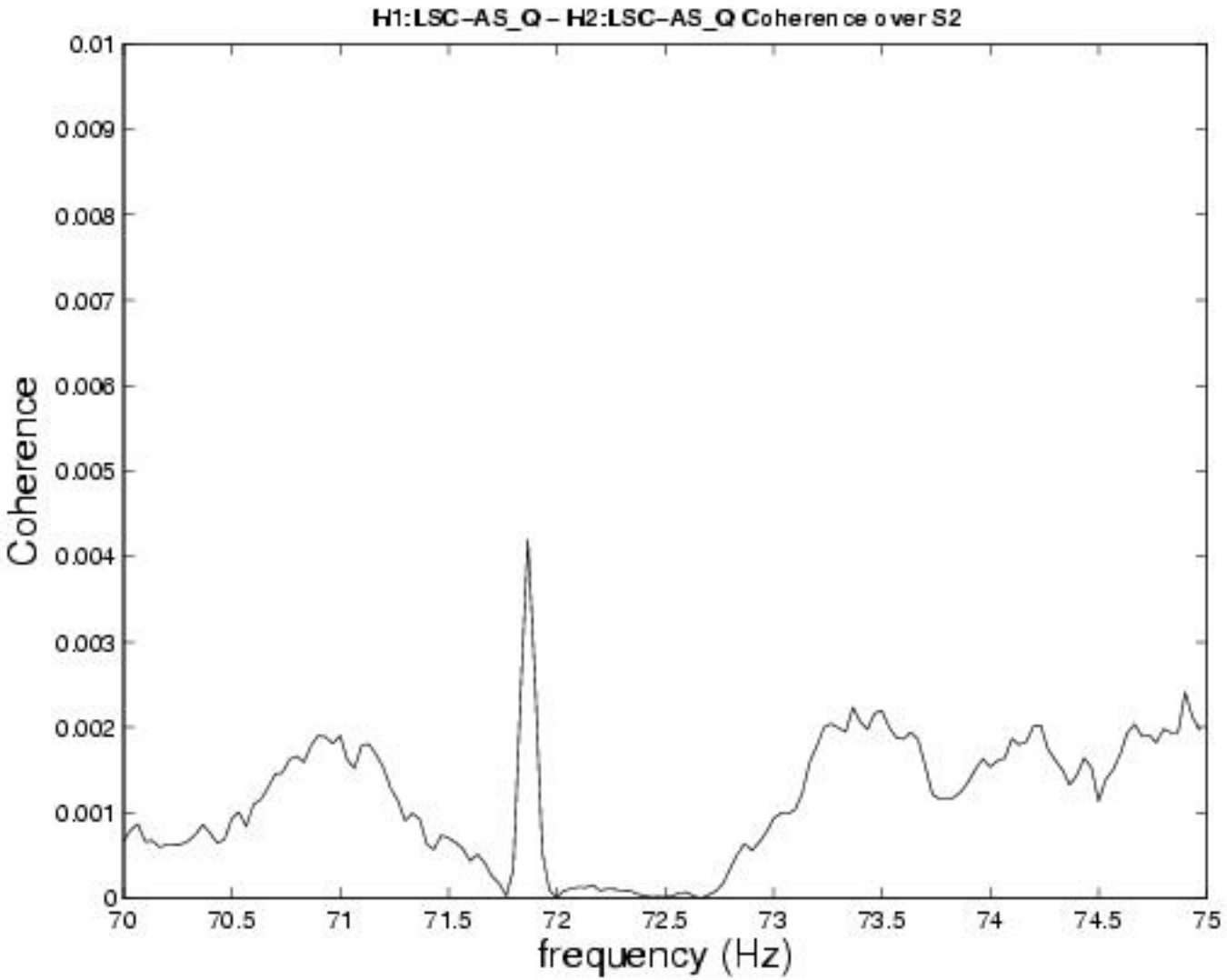
See the 59.3 Hz peak in S2 H1-H2 correlations



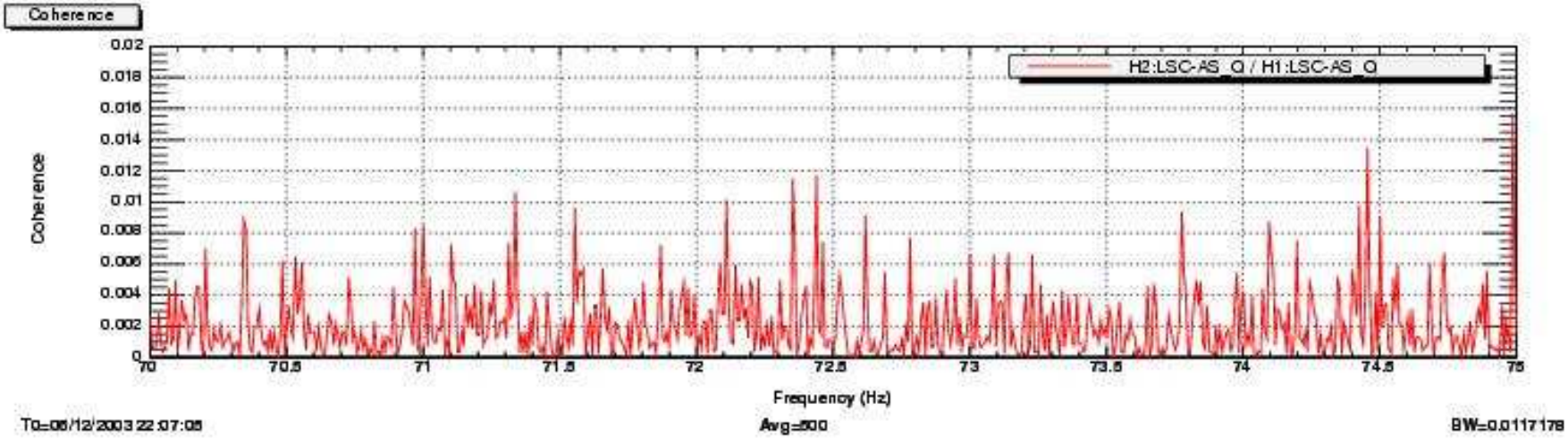
S3 H1-H2 59.3 Hz Correlation is Dramatically Decreased



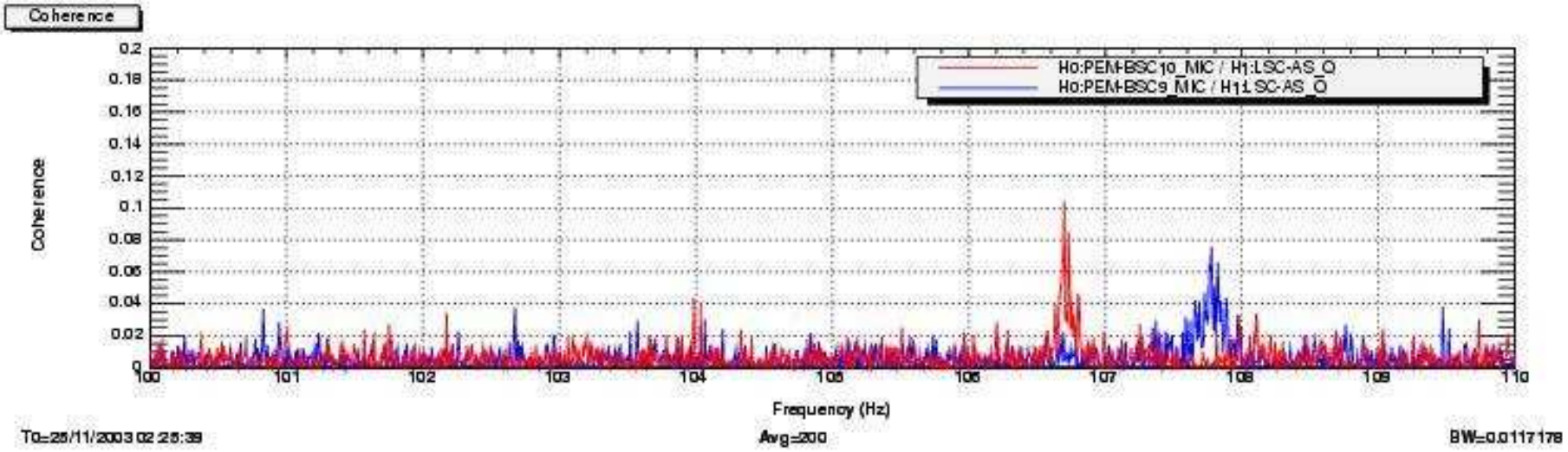
Also see 71.8 Hz peak in S2 H1-H2 Correlations



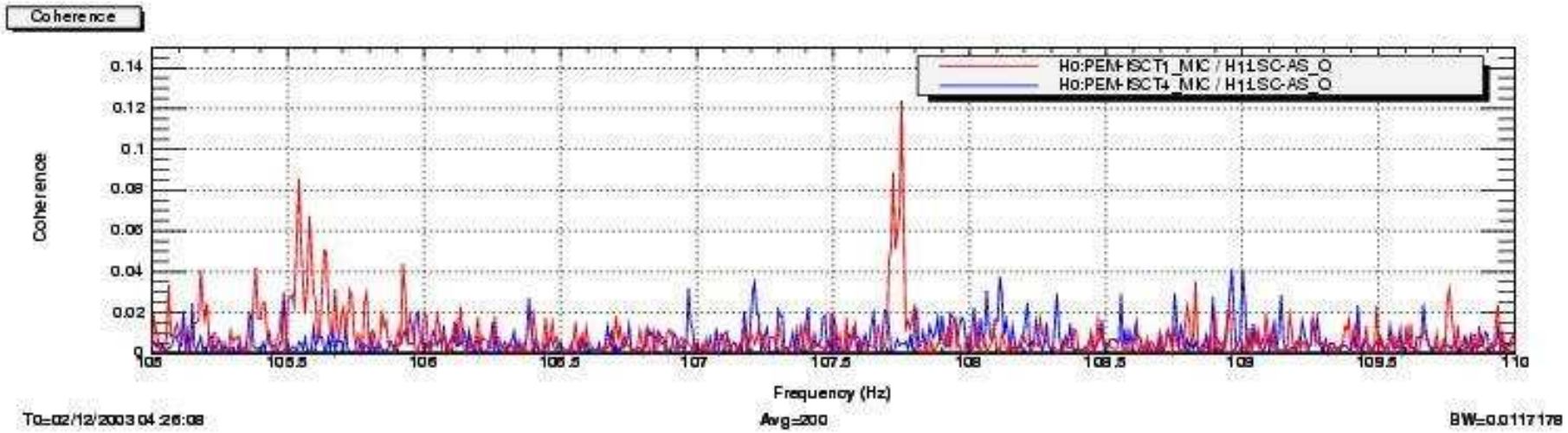
S3 H1-H2 Correlation at 71.8 Hz not seen



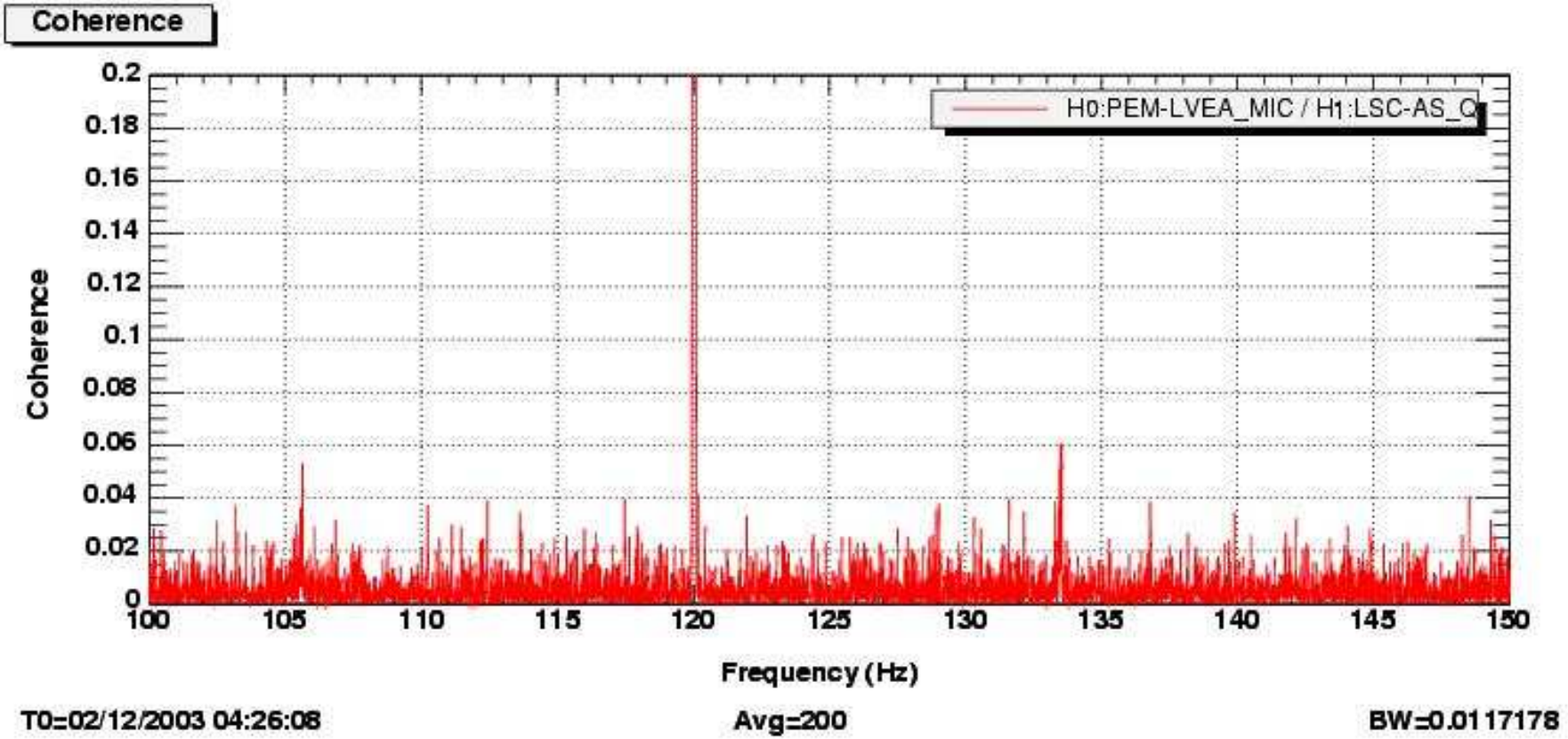
H1:LSC-AS_Q Correlation with BSC9 (x end) at 107.8 Hz and BSC10 (y end) at 106.7 Hz



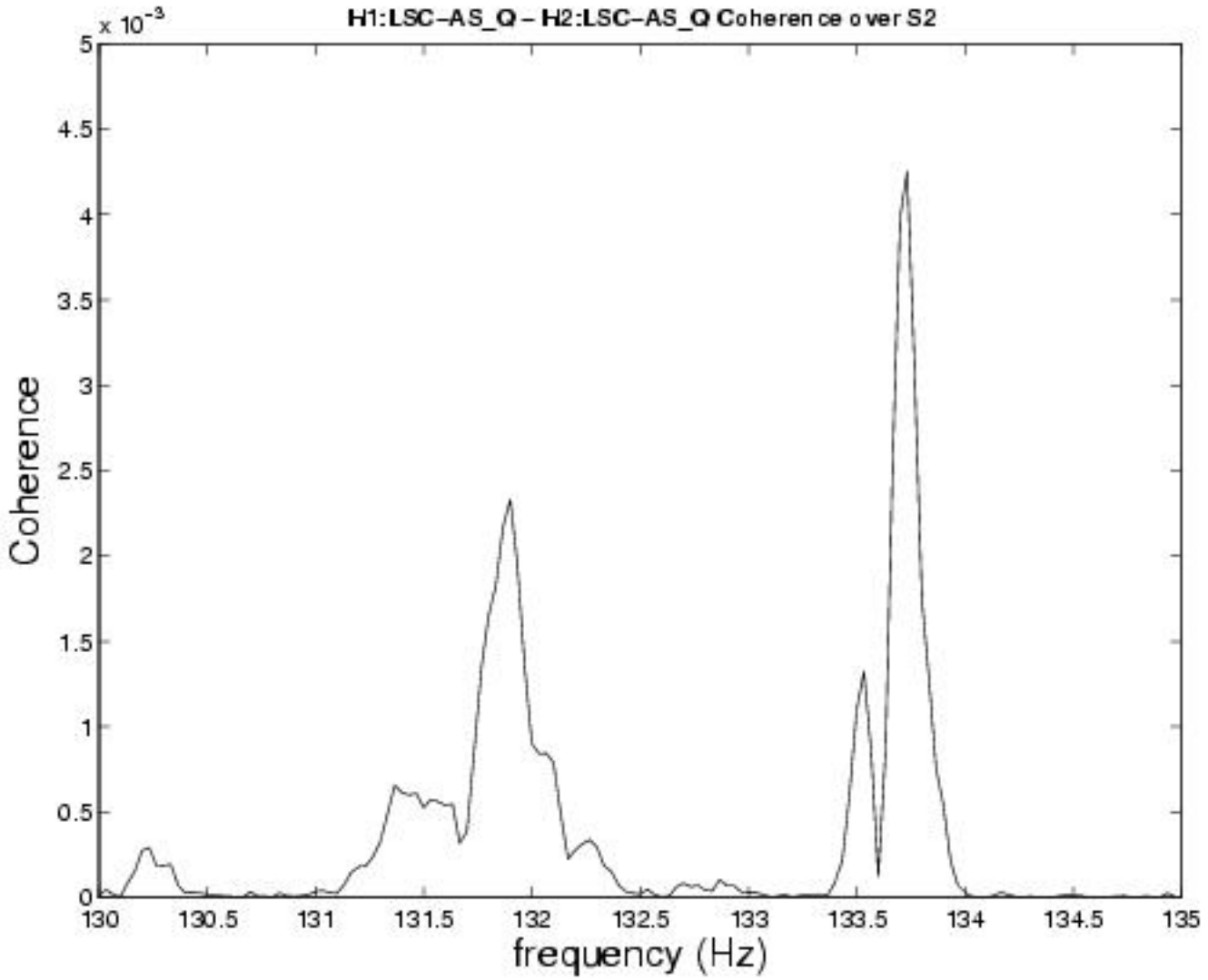
H1:LSC-AS_Q and MICs at ISCT1 and ISCT4 around 105 to 108 Hz



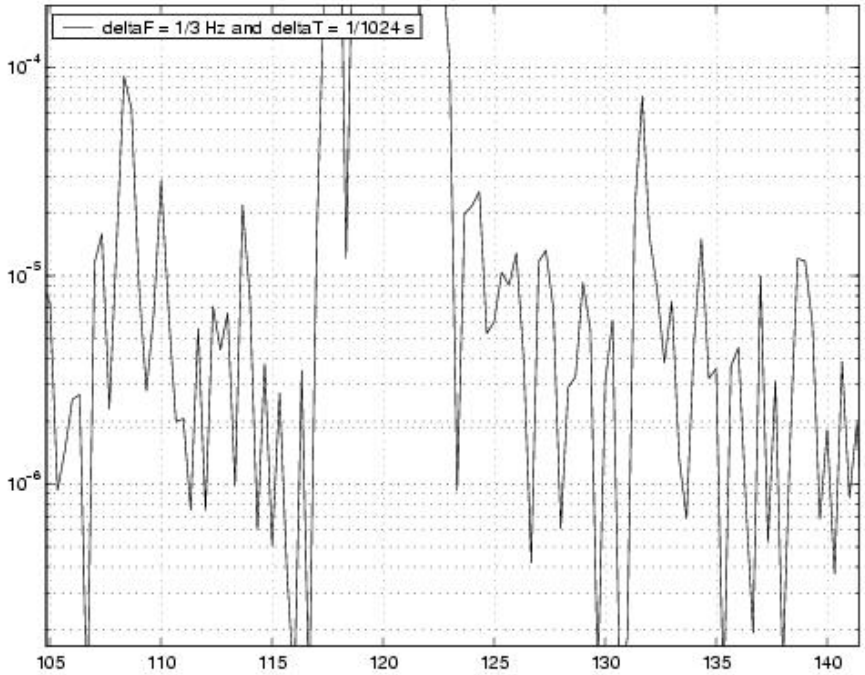
Small H1:LSC-AS_Q Correlation with Mics at LVEA and PSL1 at 133.7 Hz



See 133.7 Hz Peak in S2 H1:LSC-AS_Q / H2:LSC-AS_Q Correlation

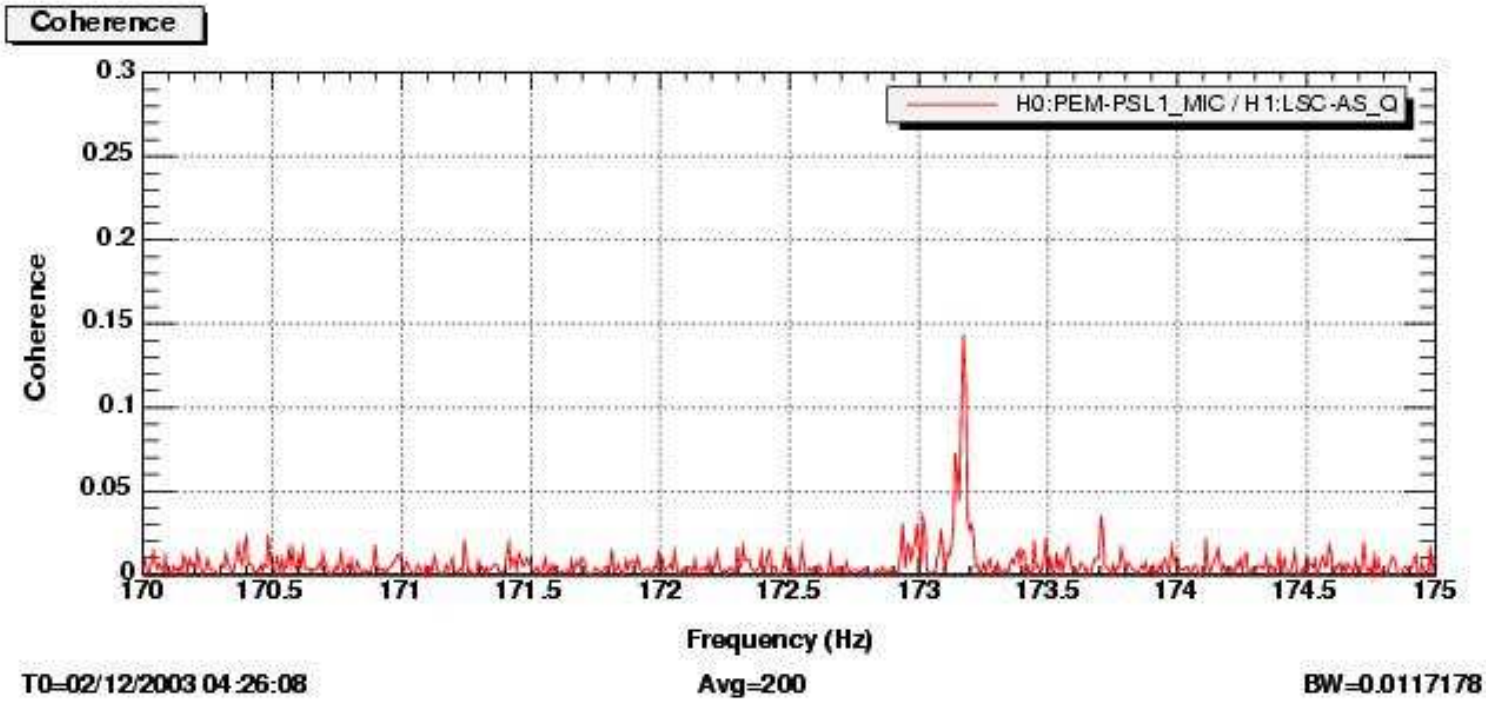


133.7 Hz peak might be slightly visible in 10 day S3 H1:LSC-AS_Q H2:LSC-AS_Q Correlation, but way down

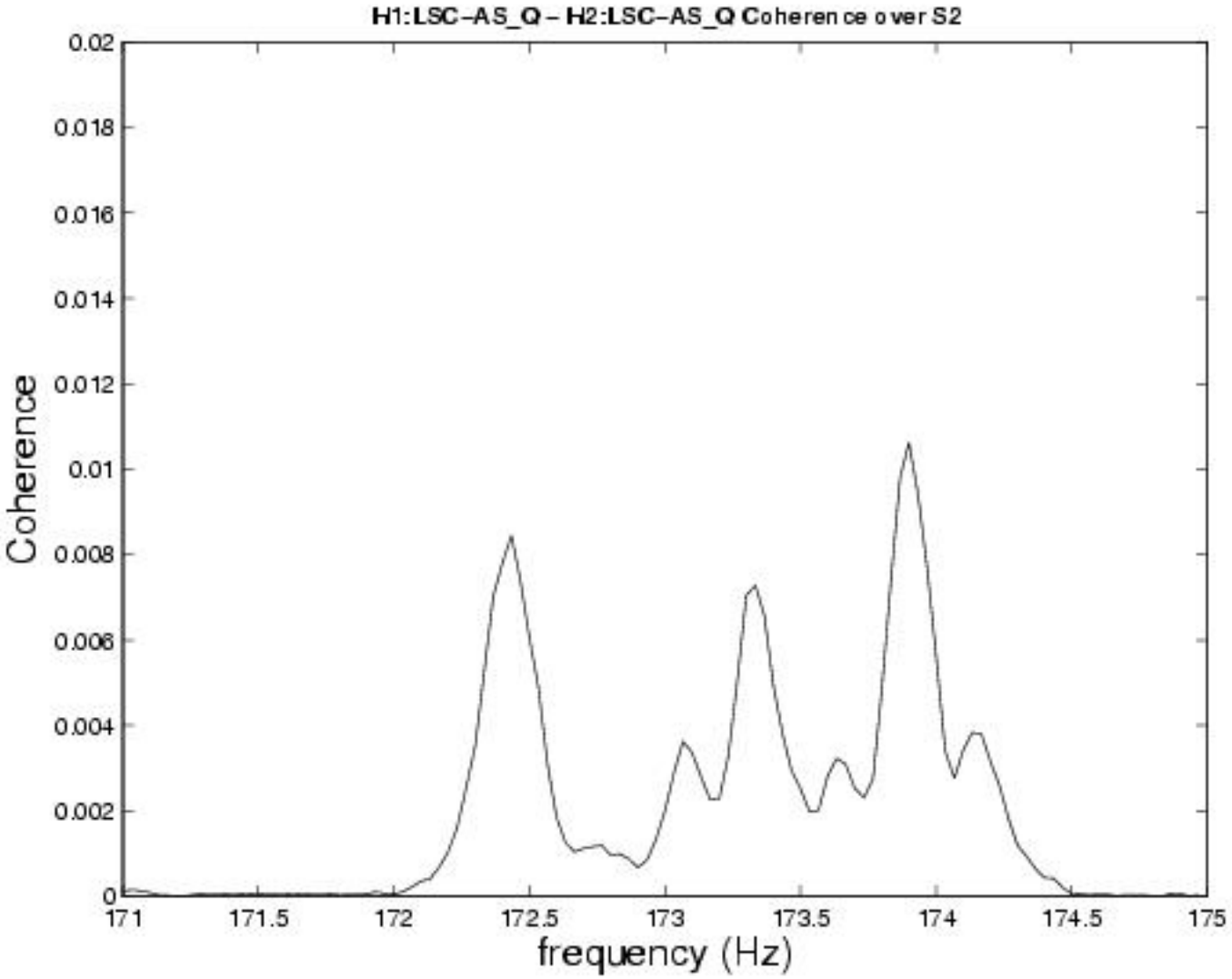


LIGO

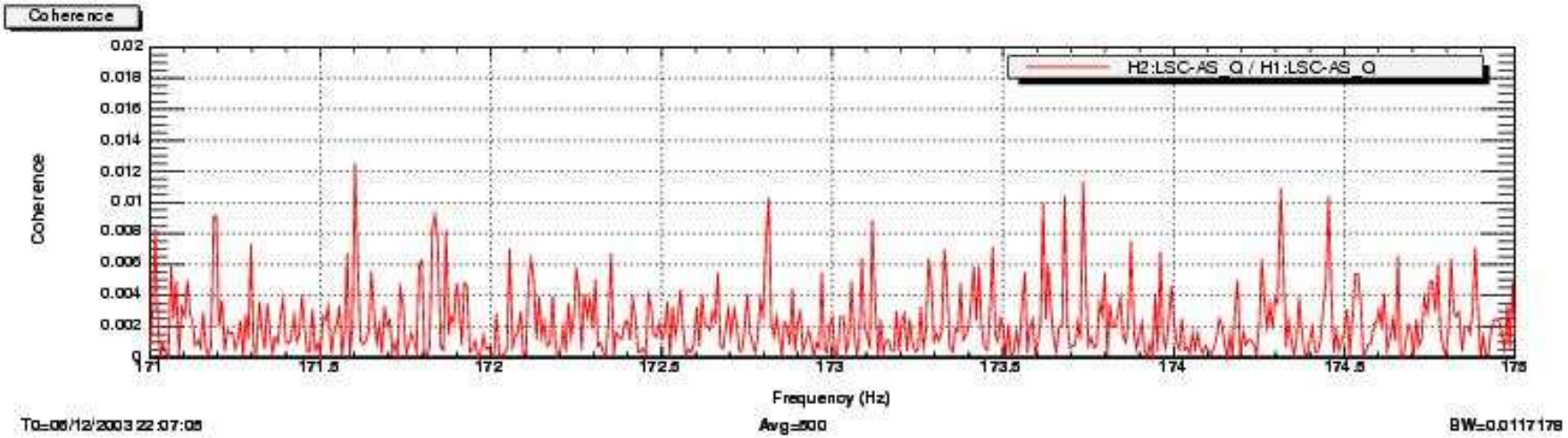
PSL1 Mic and H1:LSC-AS_Q has Significant Correlation at 173.2 Hz



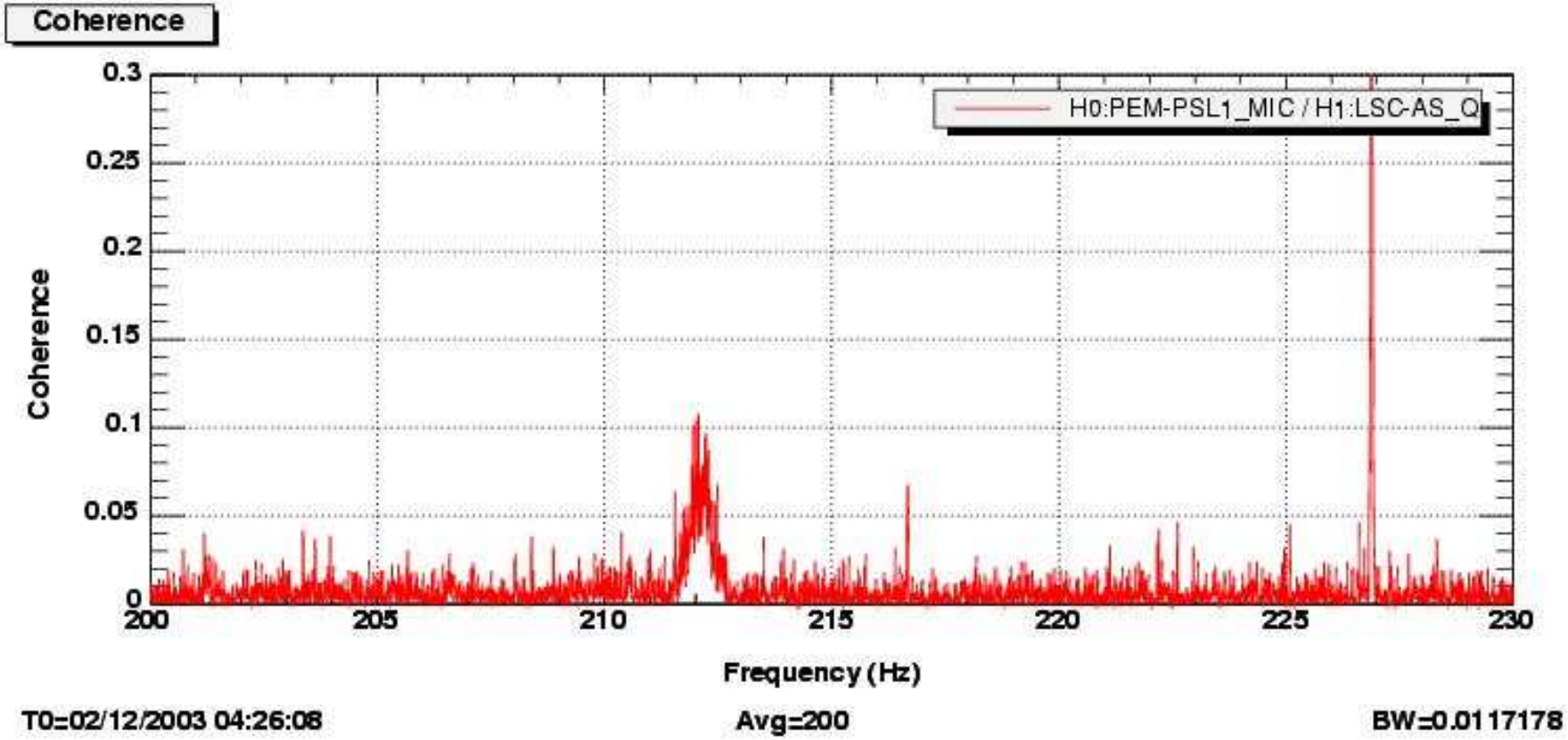
S2 H1:LSC-AS_Q H2:LSC-AS_Q Shows 173.2 Hz Peak



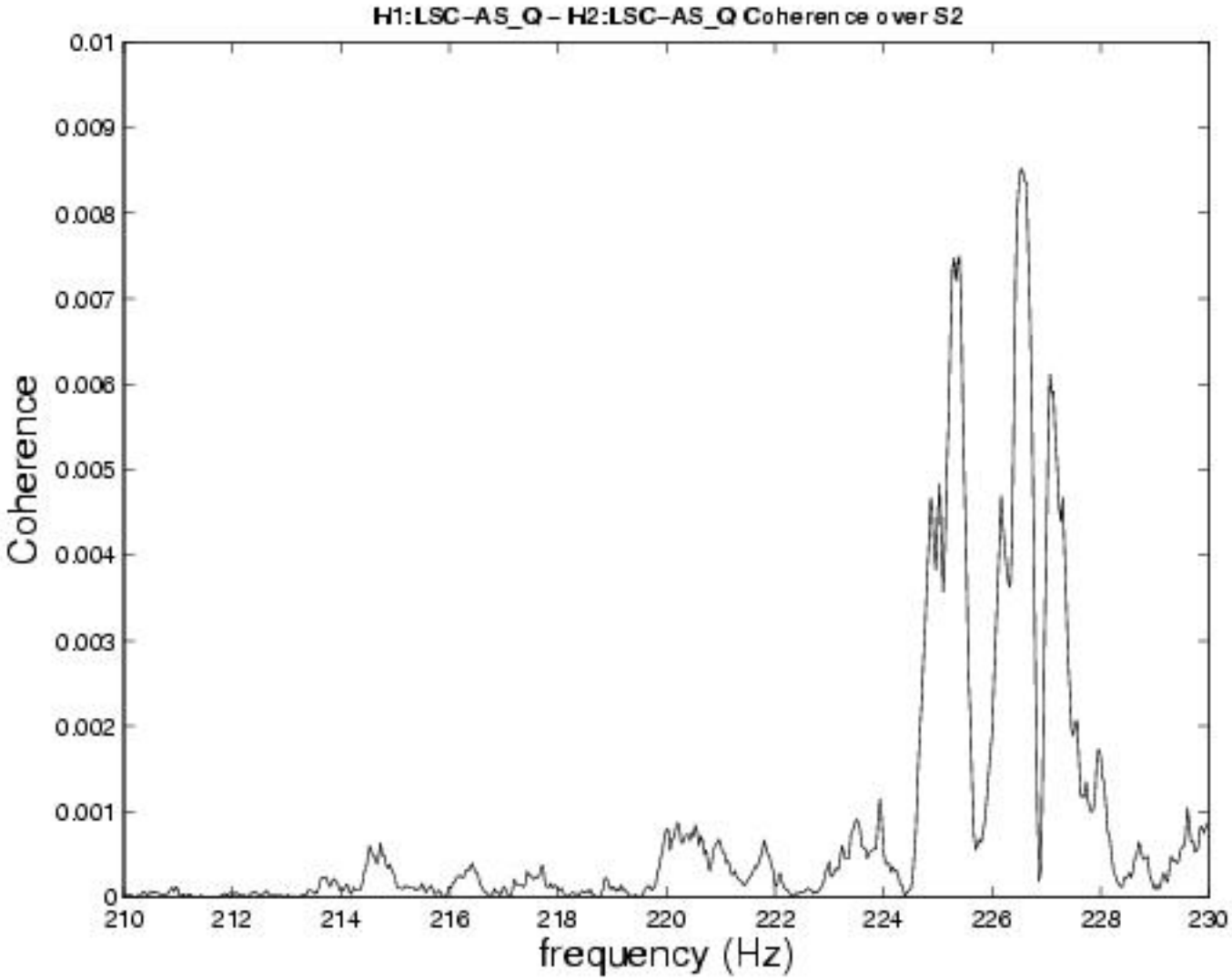
S3 H1:LSC-AS_Q H2:LSC-AS_Q Correlation way down at 173.2 Hz



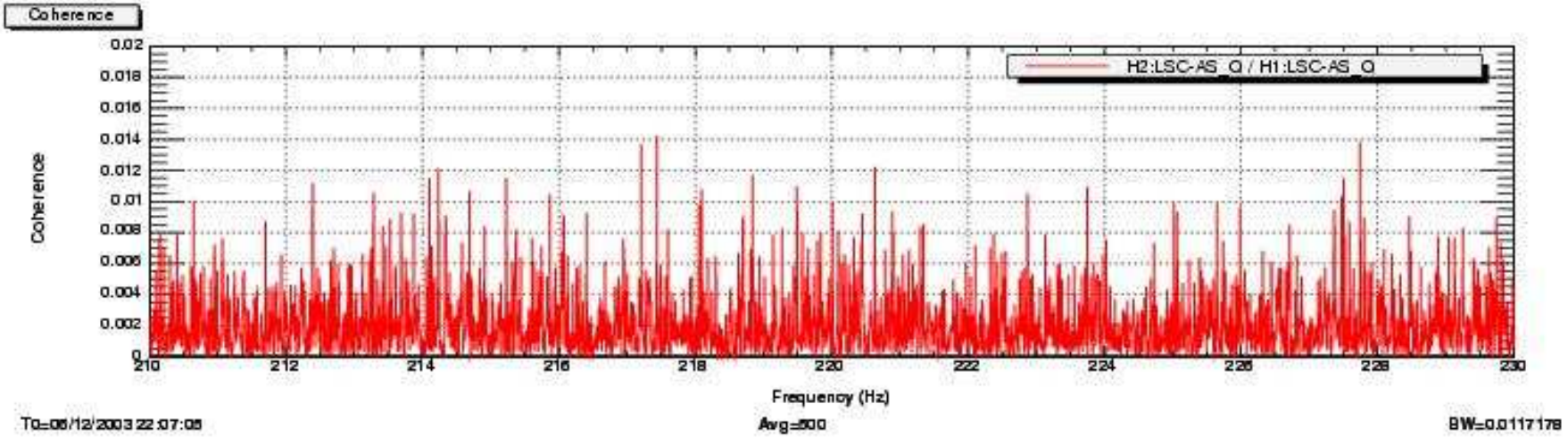
H1:LSC-AS_Q Correlations with PSL1 MIC at 212 and 227 Hz



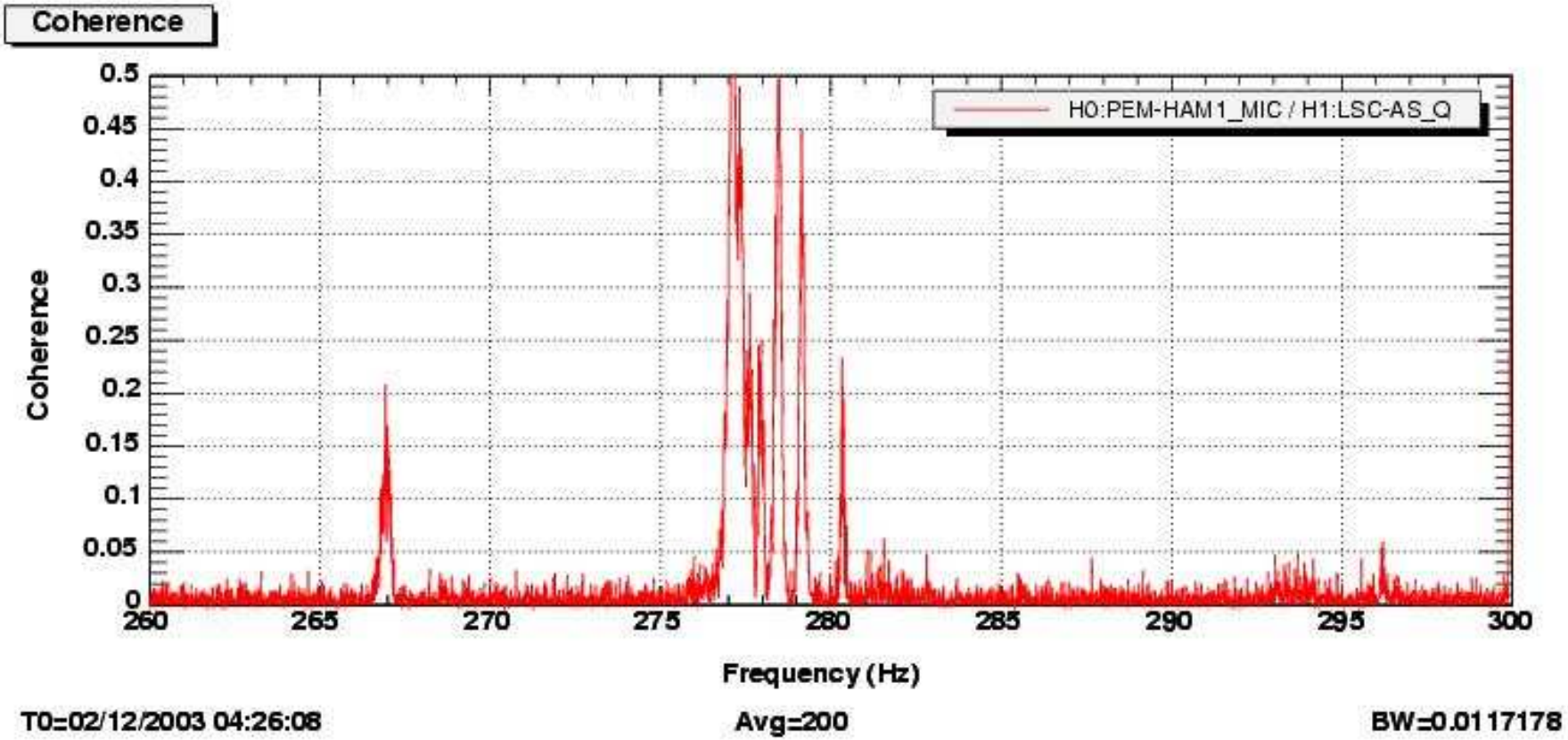
The 227 Hz Peak Might Be Seen in S2 H1:"SC-AS_Q and H2:LCS-AS_Q Correlation



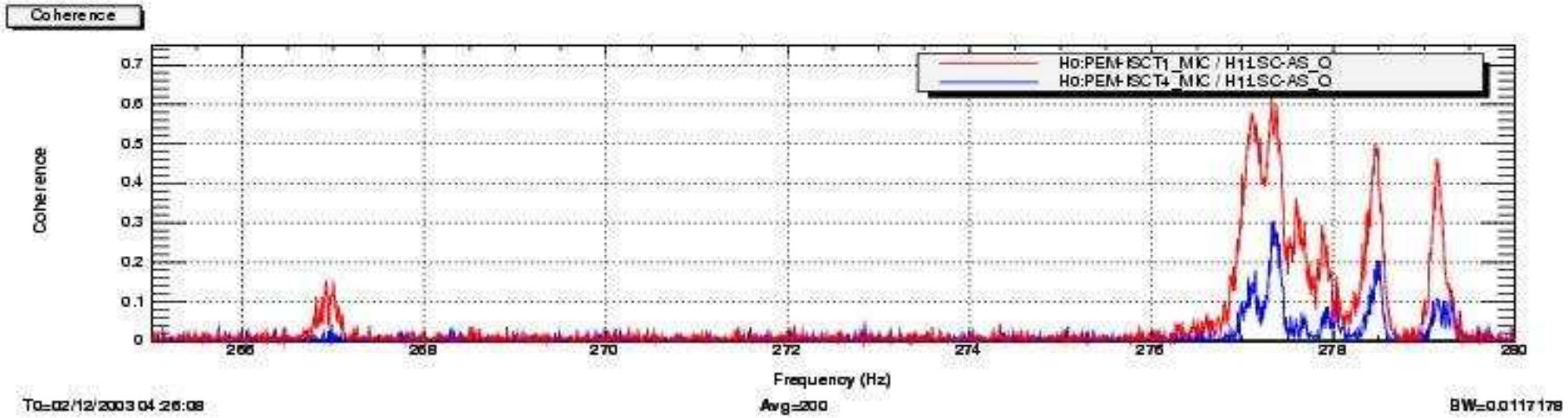
227 Hz Peak is gone in S3 H1:LSC-AS_Q H2:LSC-AS_Q Correlation



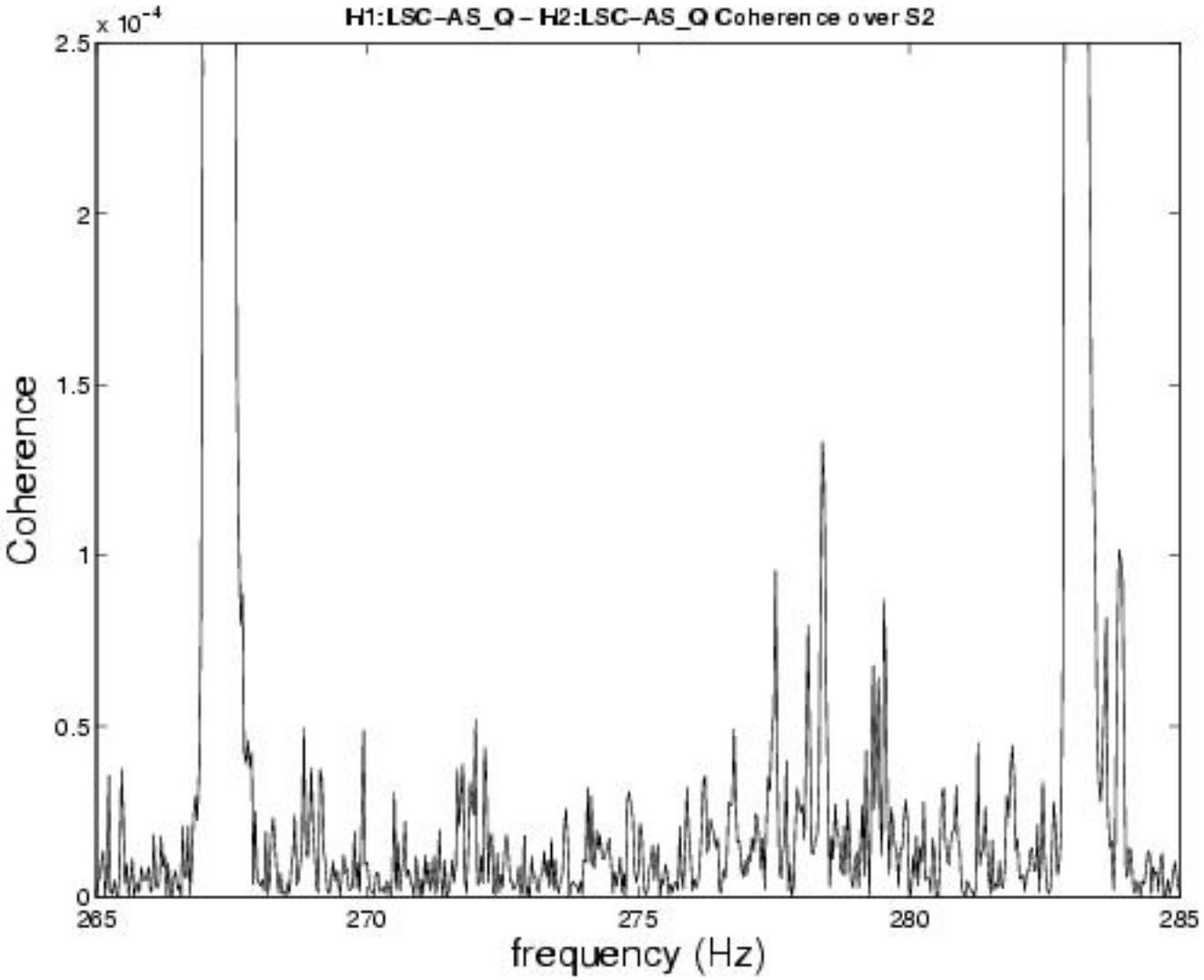
Many Correlations around 267 and 277 Hz between H1:LSC-AS_Q and MICs at HAM1 and PSL1



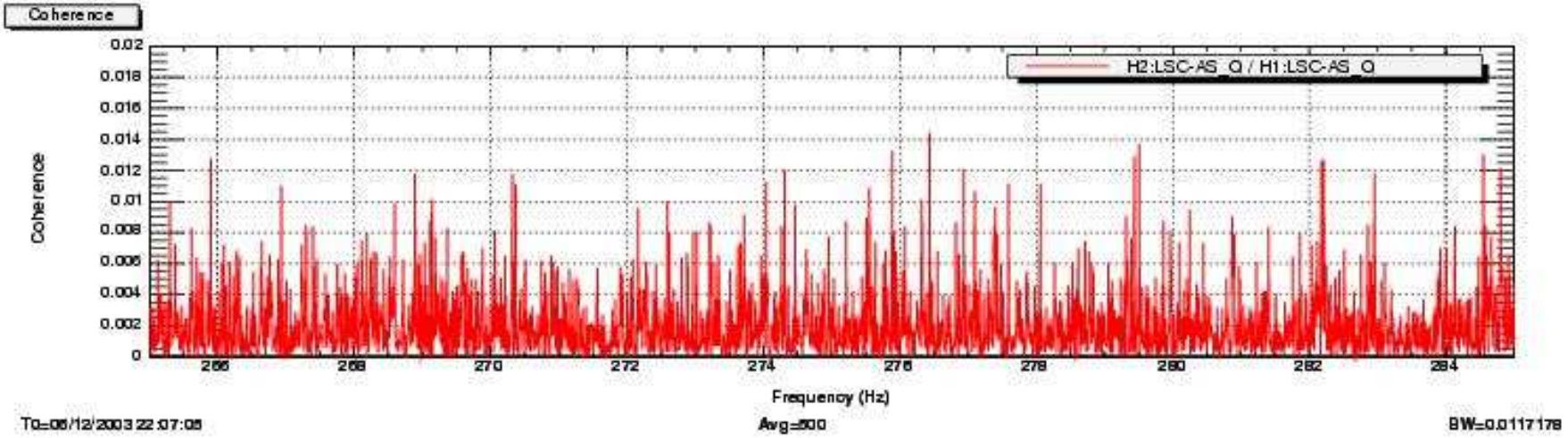
H1:LSC-AS_Q Correlations with ISCT1_MIC around 277-279 Hz



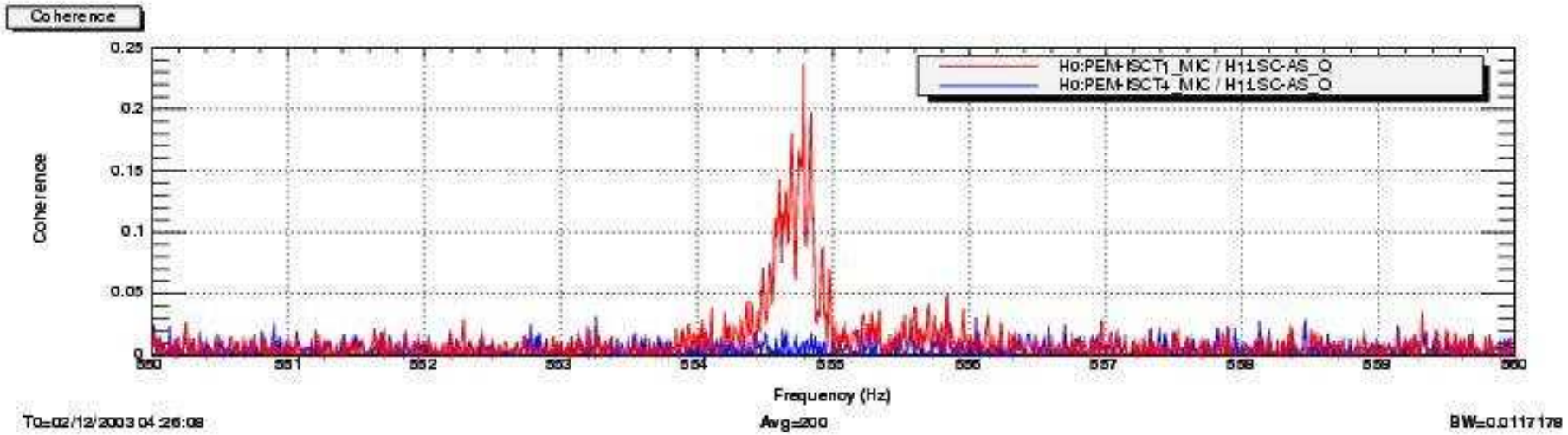
S2 Correlation Between H1:LSC-AS_Q and H2:LSC-AS_Q at 267 Hz and smaller at 275 Hz



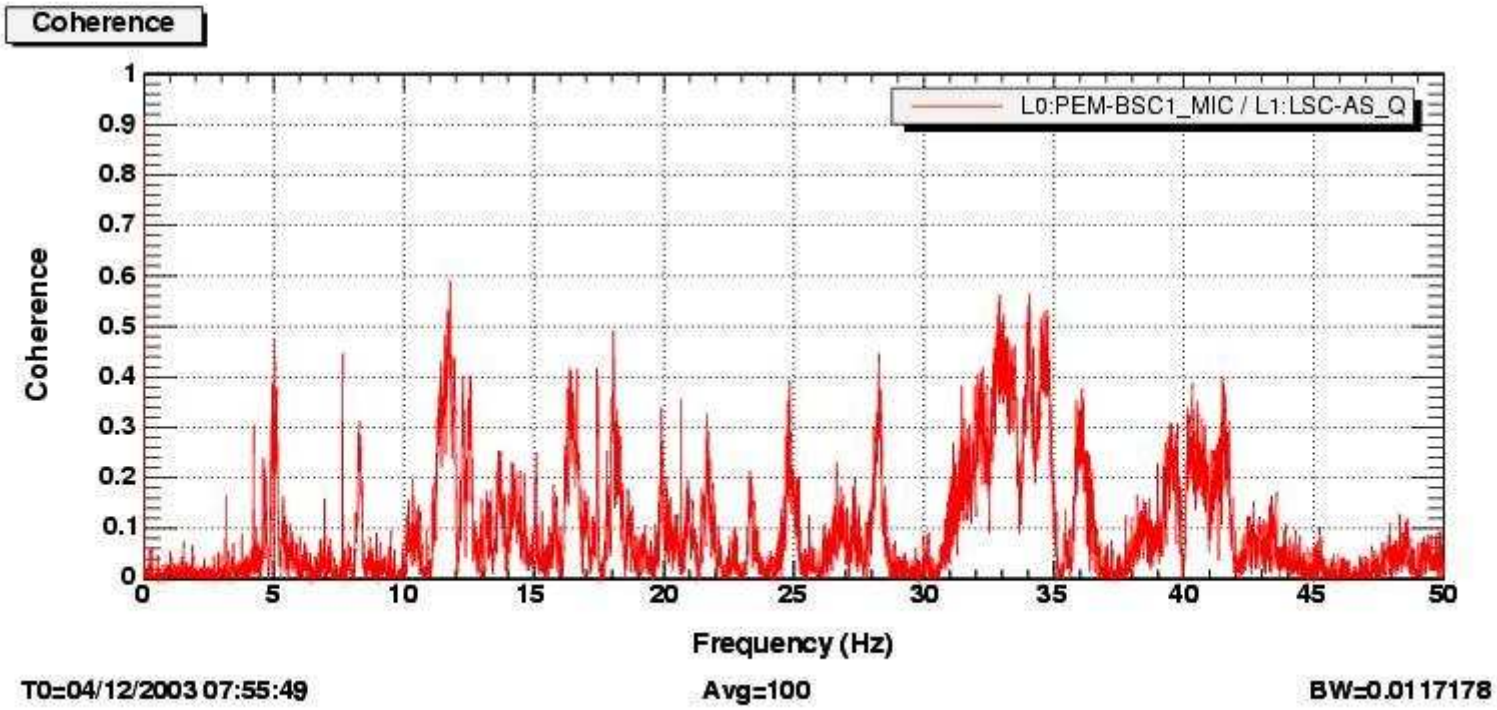
S3: Cannot see 267 or 277 Hz Correlation between H1:LSC-AS_Q and H2:LSC-AS_Q



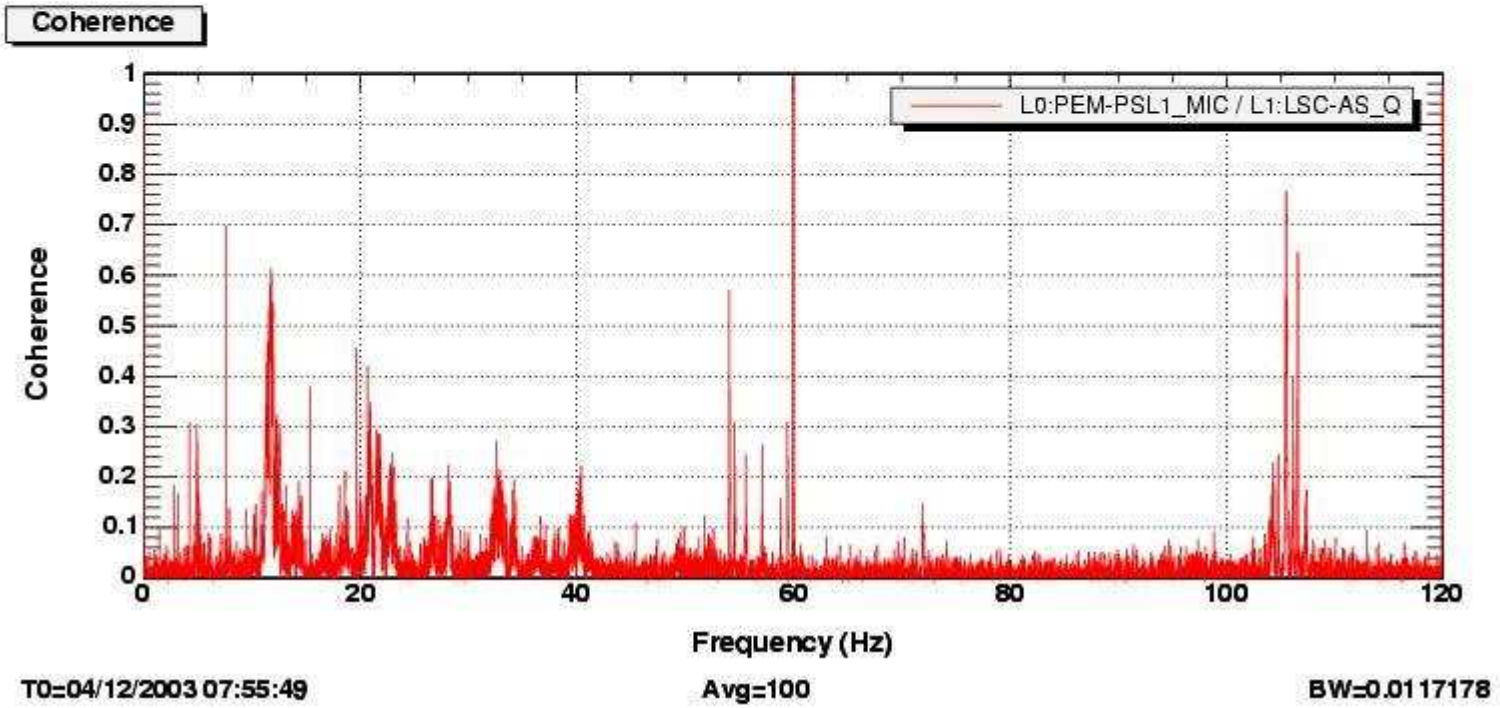
Strong H1:LSC-AS_Q and ISTC1_MIC at 554.8 Hz



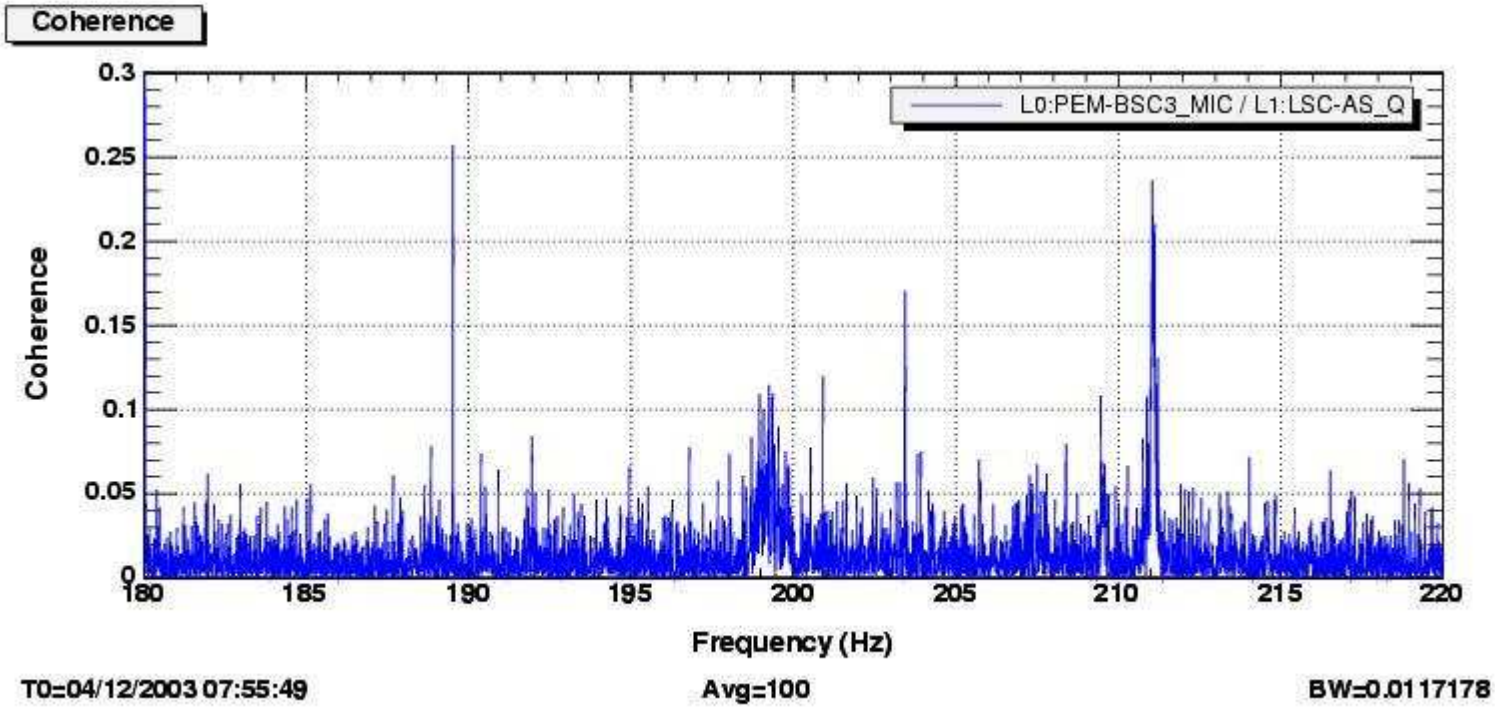
LLO L1:LSC-AS_Q and Microphone Correaltions BSC1 Strong at Low Frequency



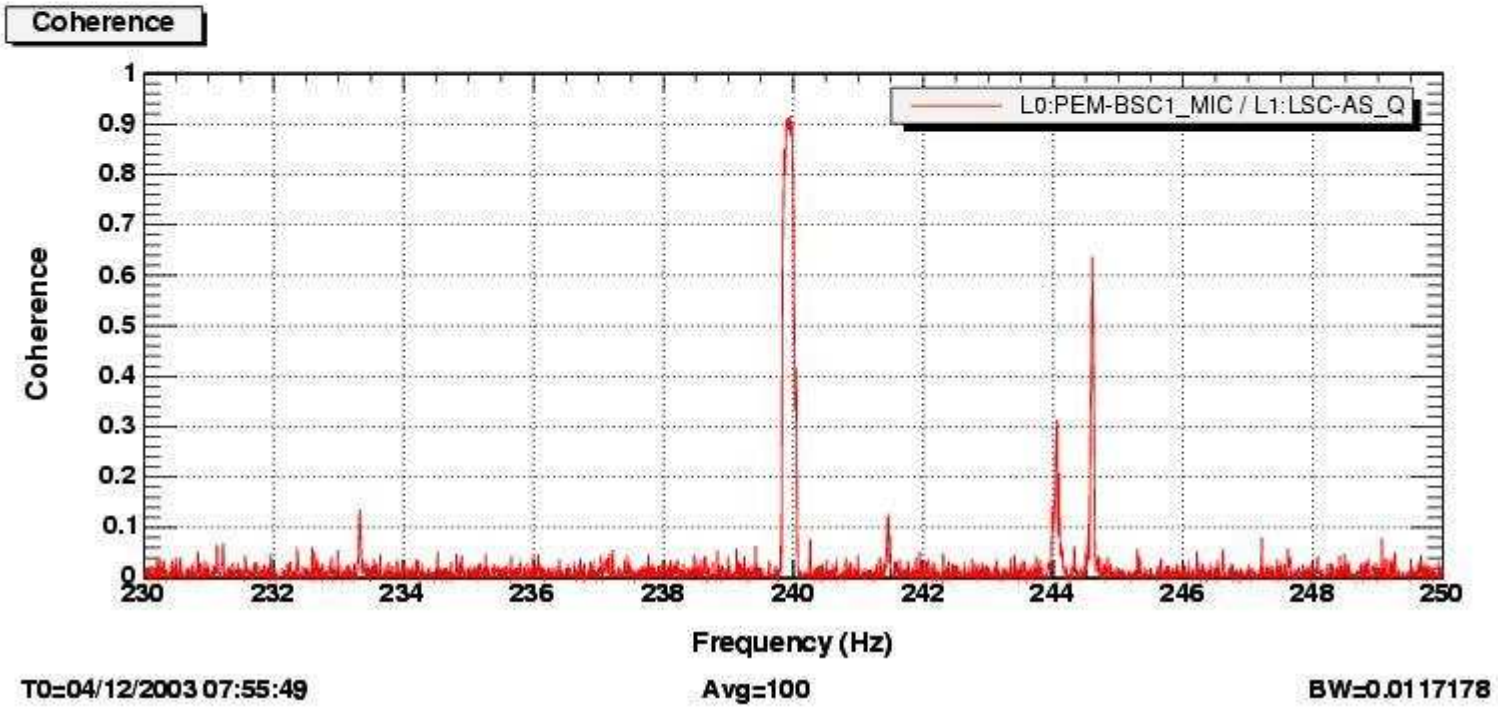
Very Strong L1:LSC-AS_Q Correlation at 105 Hz with MICs at PSL1, BSC1, BSC3 and BSC4



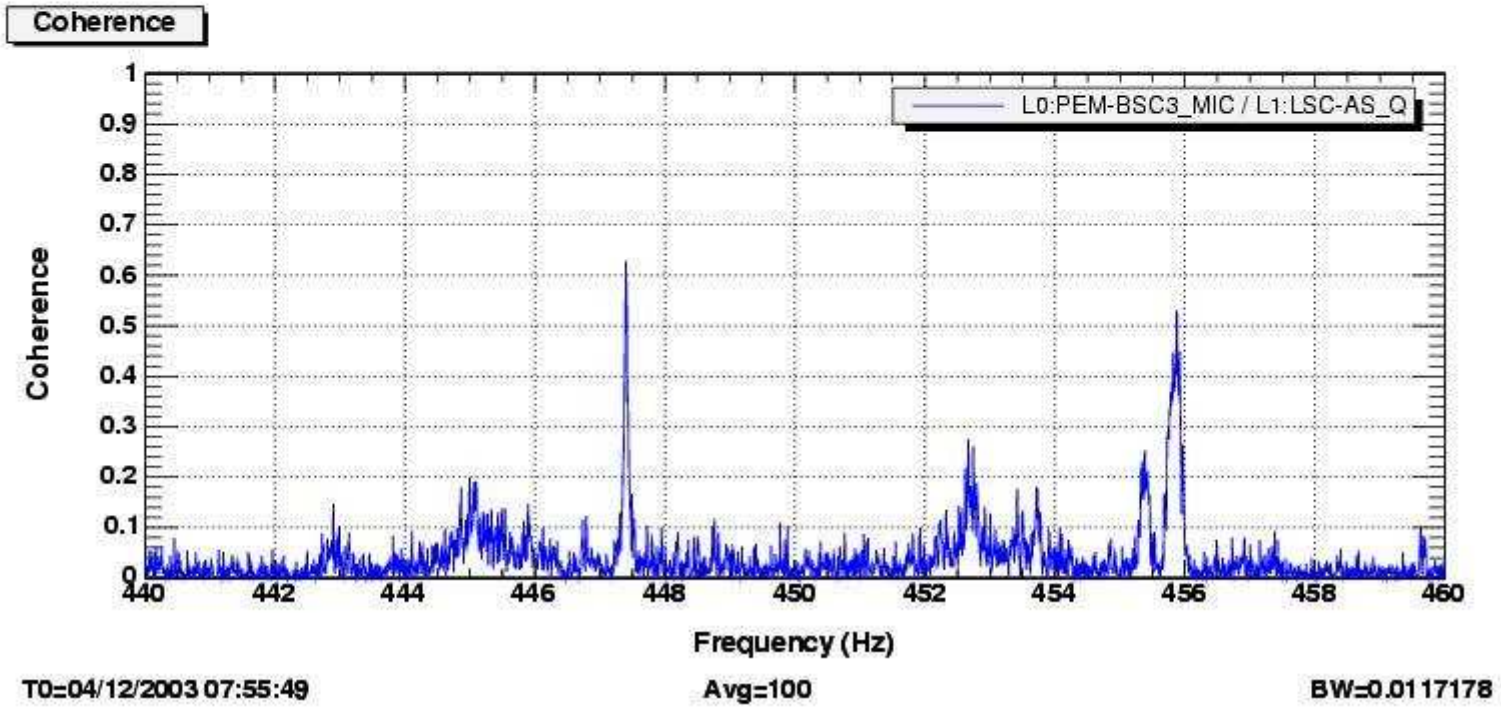
L1:LSC-AS_Q and MIC at BSC3 Correlations at 189 and 211 Hz



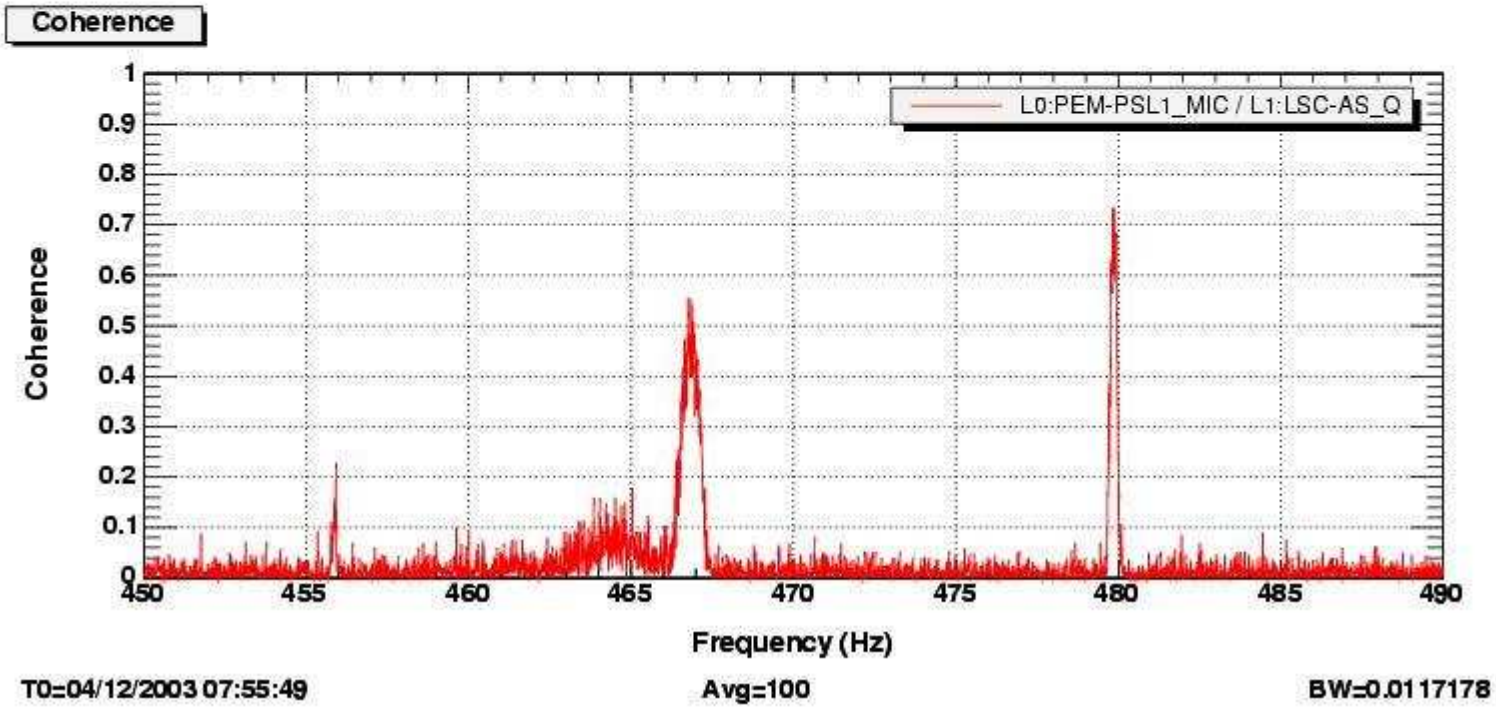
L1:LSC-AS_Q Correlation with MIC at BSC1 at 244 and 244.6 Hz



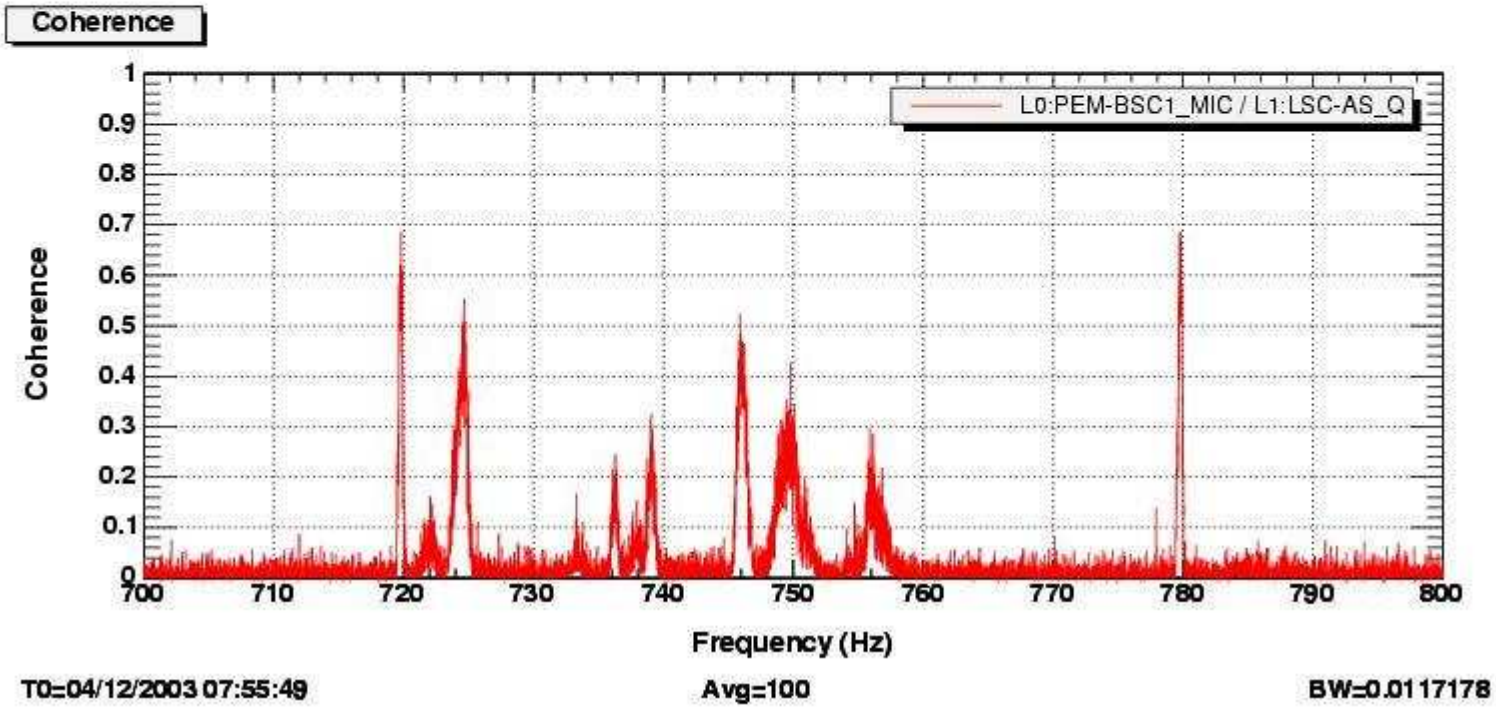
Many Correlation between L1:LSC-AS_Q and MIC at BSC3 in 444 to 456 Hz band



Strong Correlation Between L1:LSC-AS_Q and PSL1 Mic at 467 Hz

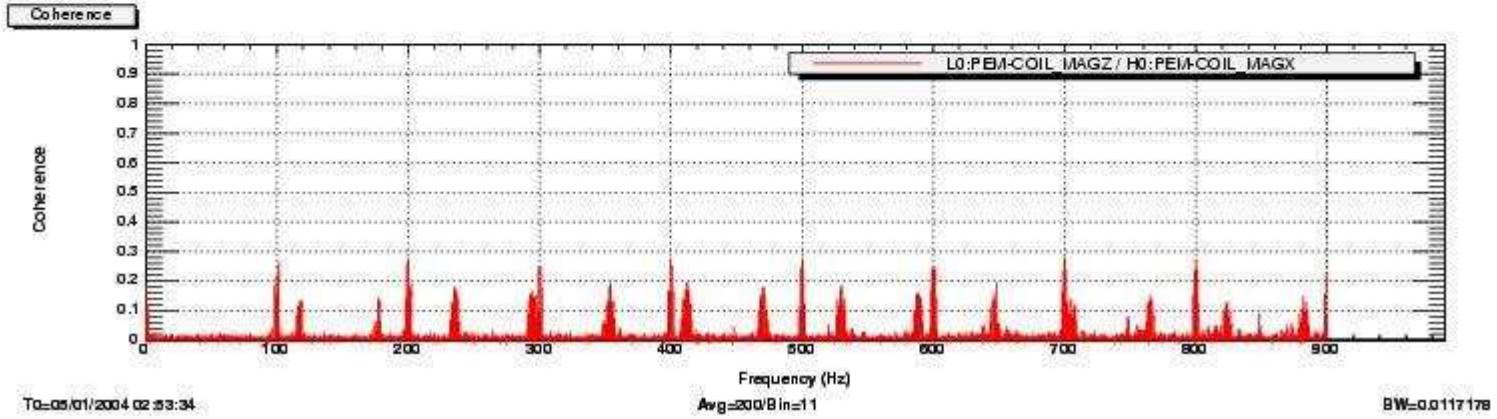


Many Correlations Between L1:LSC-AS_Q and MICs at BSC1 and BSC2 from 720 to 760 Hz

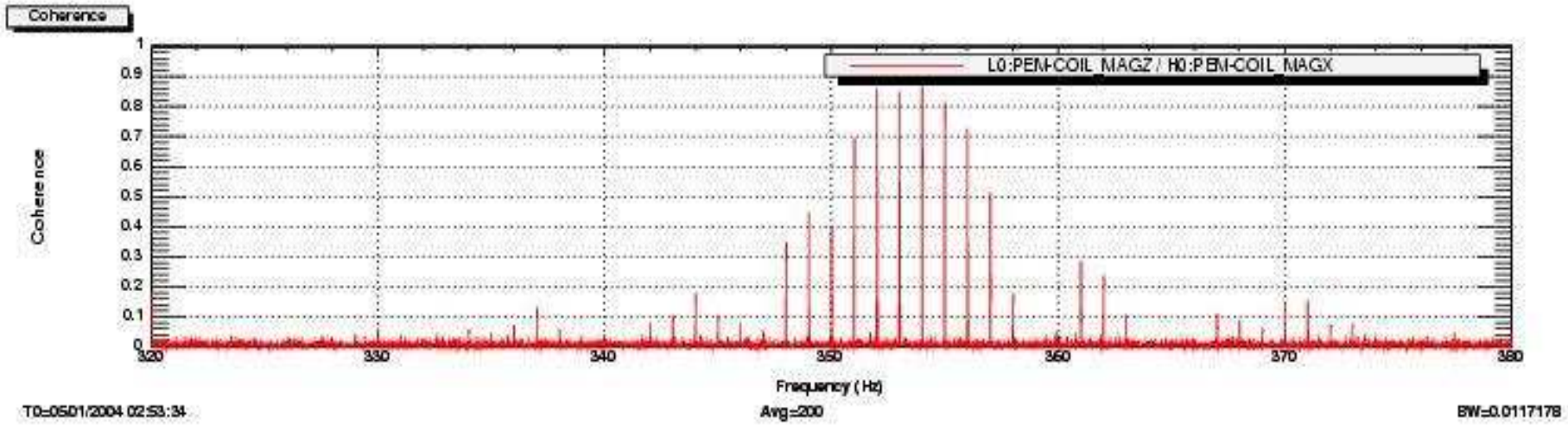


Intersite (LLO-LHO) Correlations Magnetometer Correlations

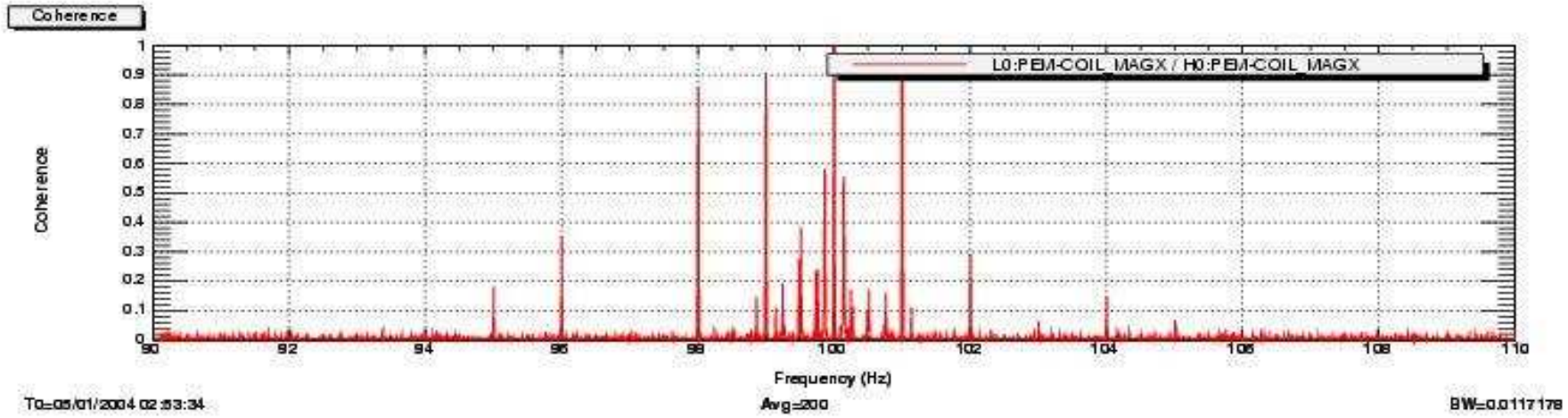
Magnetometers at LLO and LHO
Correlations clustered around 60 Hz, 100Hz, and harmonics thereof



LLO and LHO Coil Magnetometer Correlation Around 360 Hz



LLO LHO Magnetometer Correlation around 100 Hz



Magnetometers Do Correlate with AS_Q. LLO example