

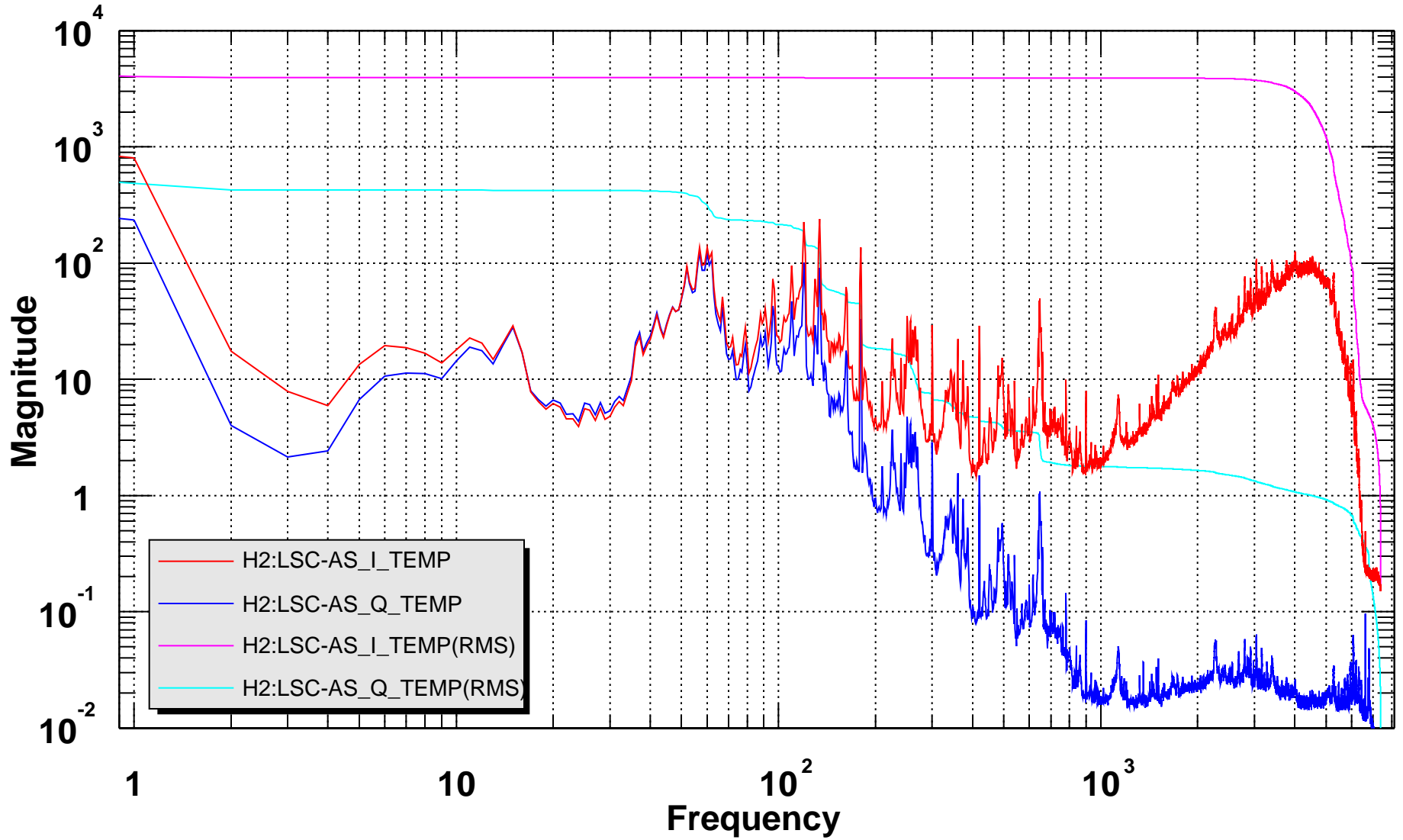
DIAGNOSTICS TEST TOOL

LSC Livingston Meeting, March 2000

Daniel Sigg



Power spectrum

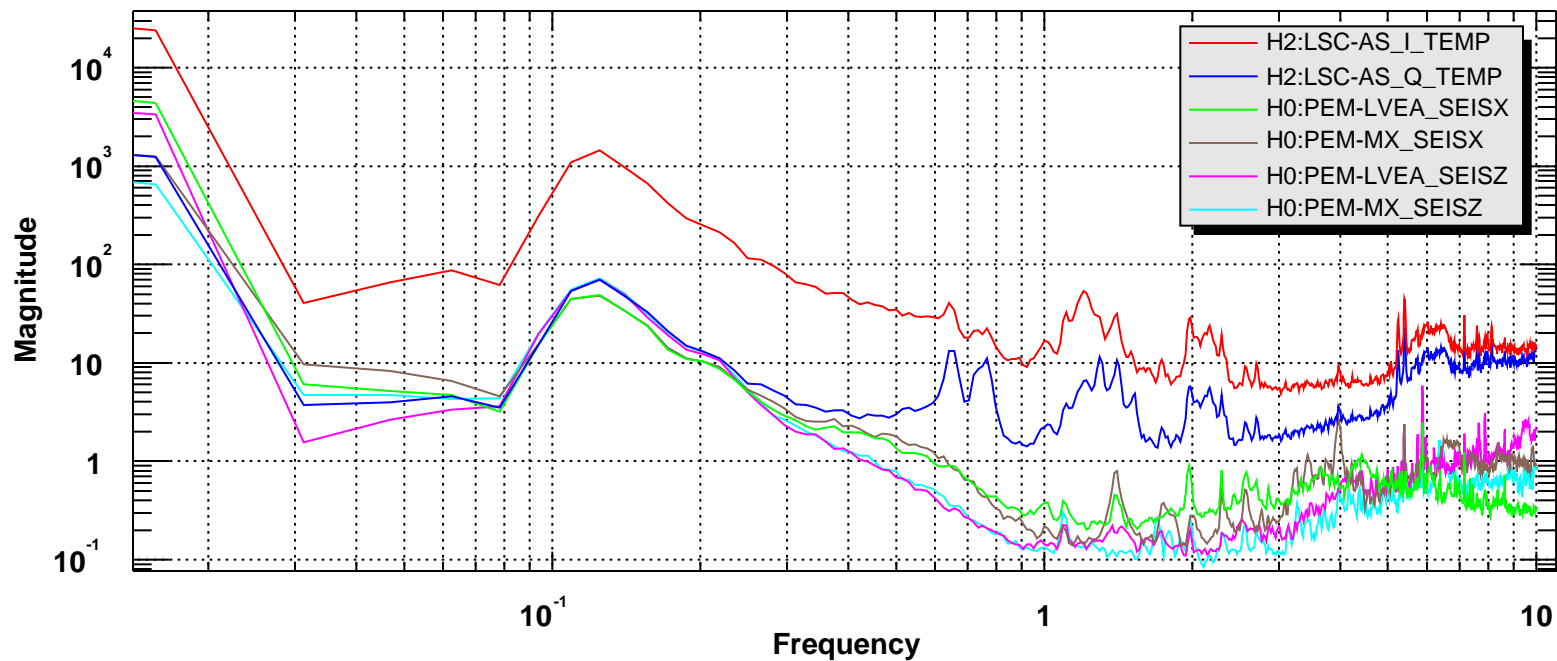


T0=03/03/2000 07:55:00

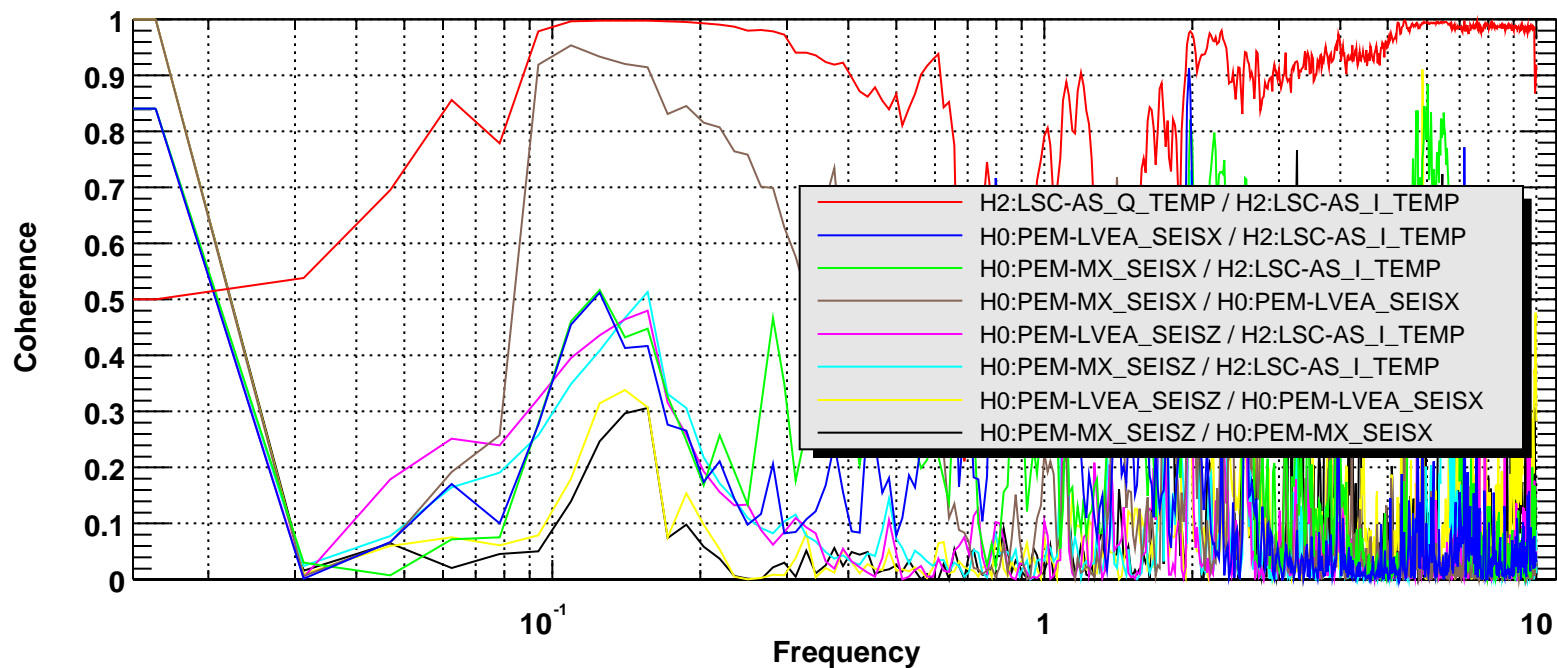
Avg=100

BW=1.49999

Power spectrum



Coherence

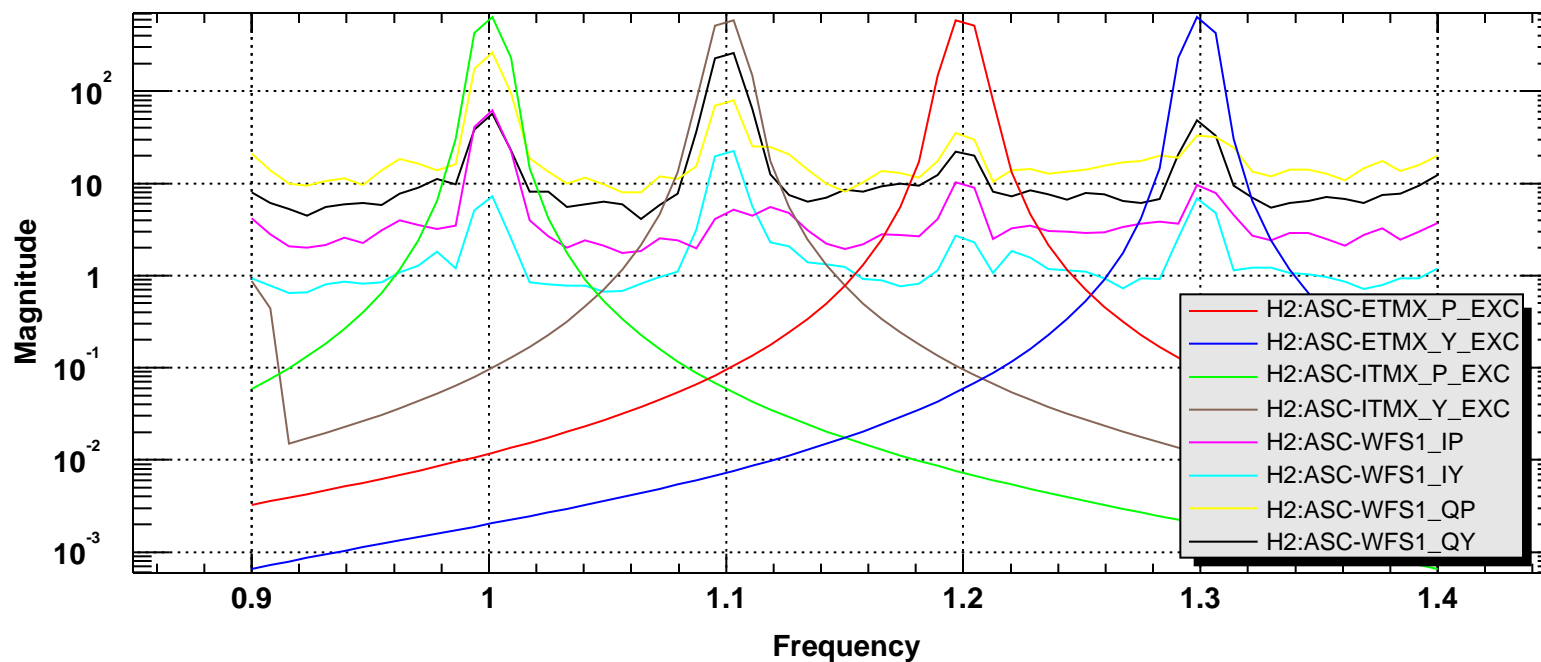


T0=03/03/2000 07:55:00

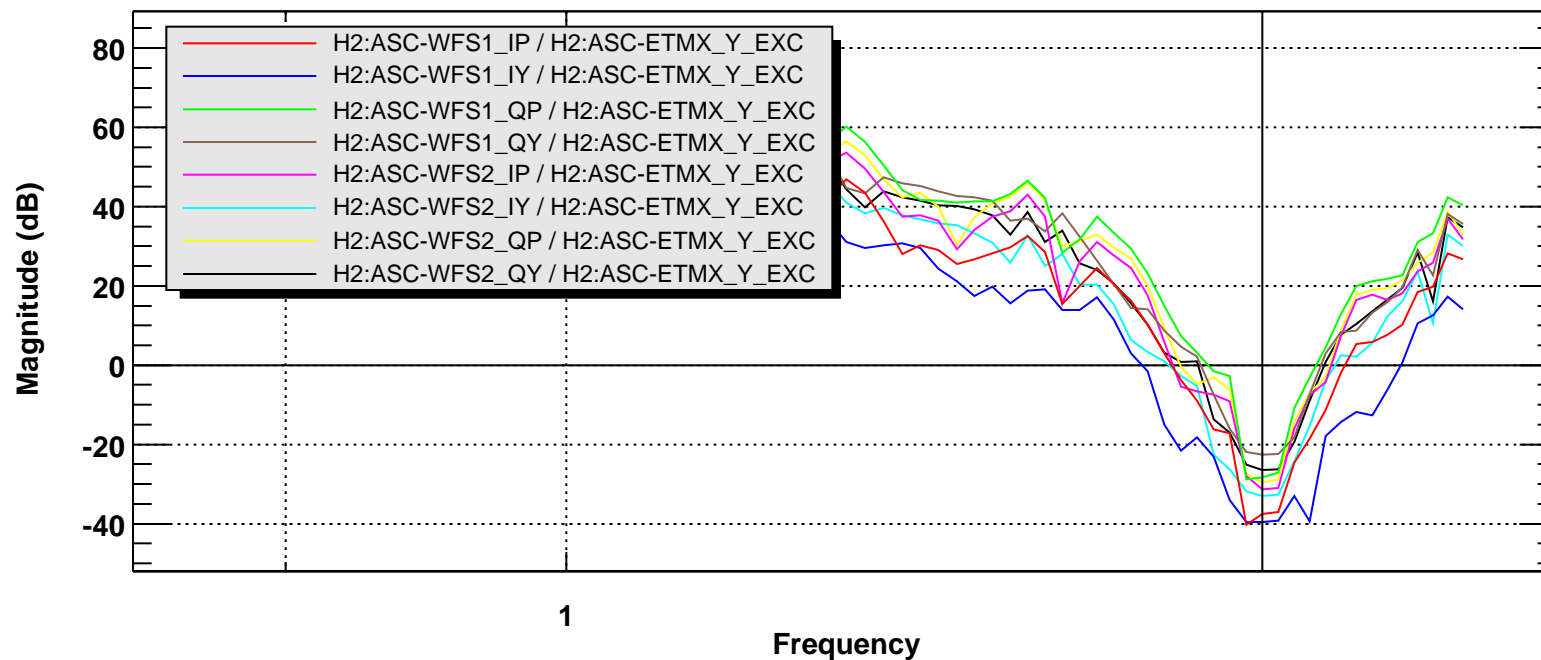
Avg=60

BW=0.0234375

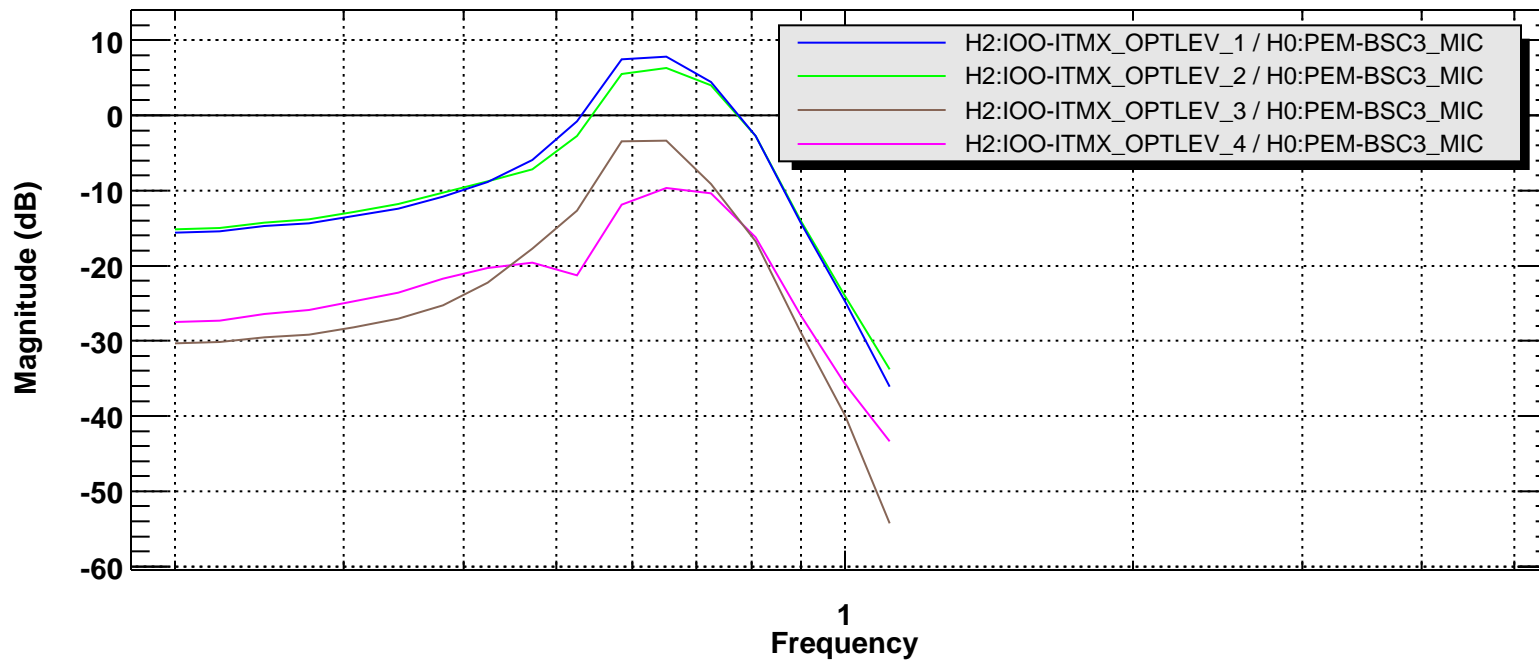
Power spectrum



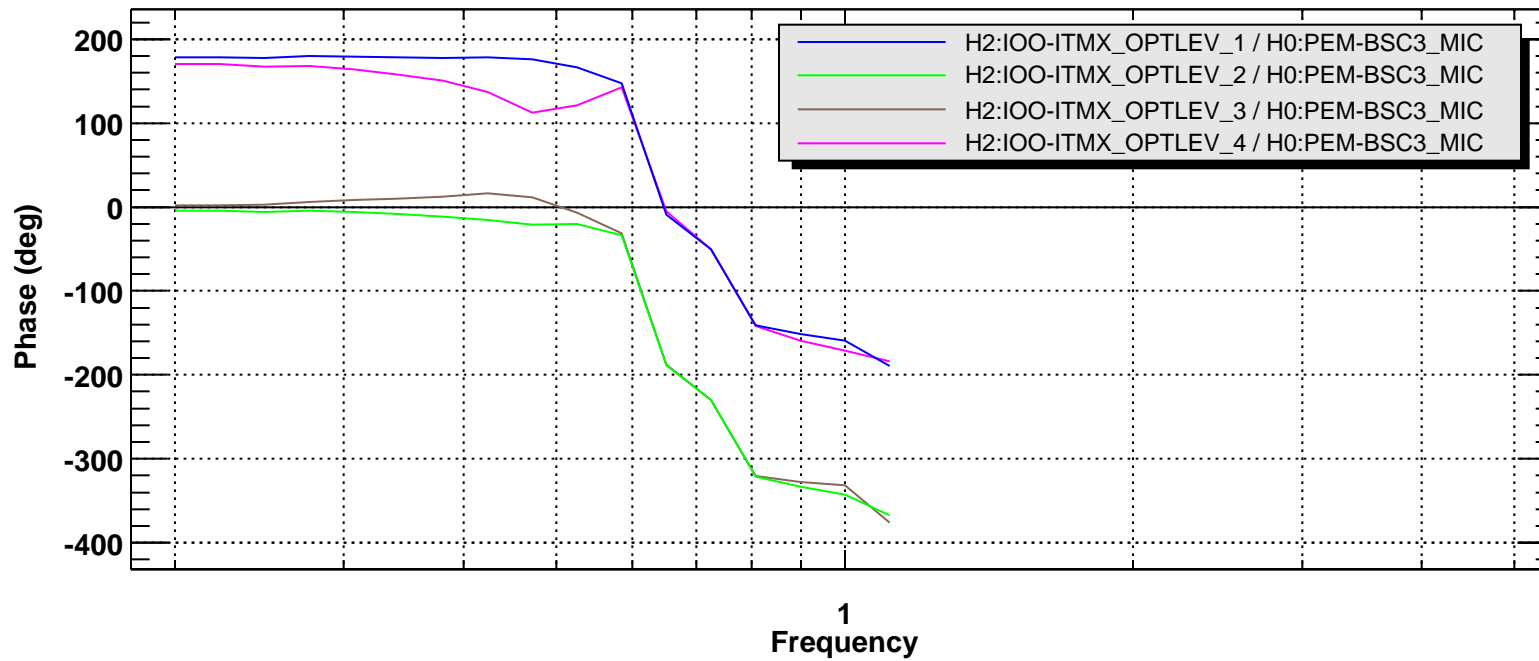
Transfer function



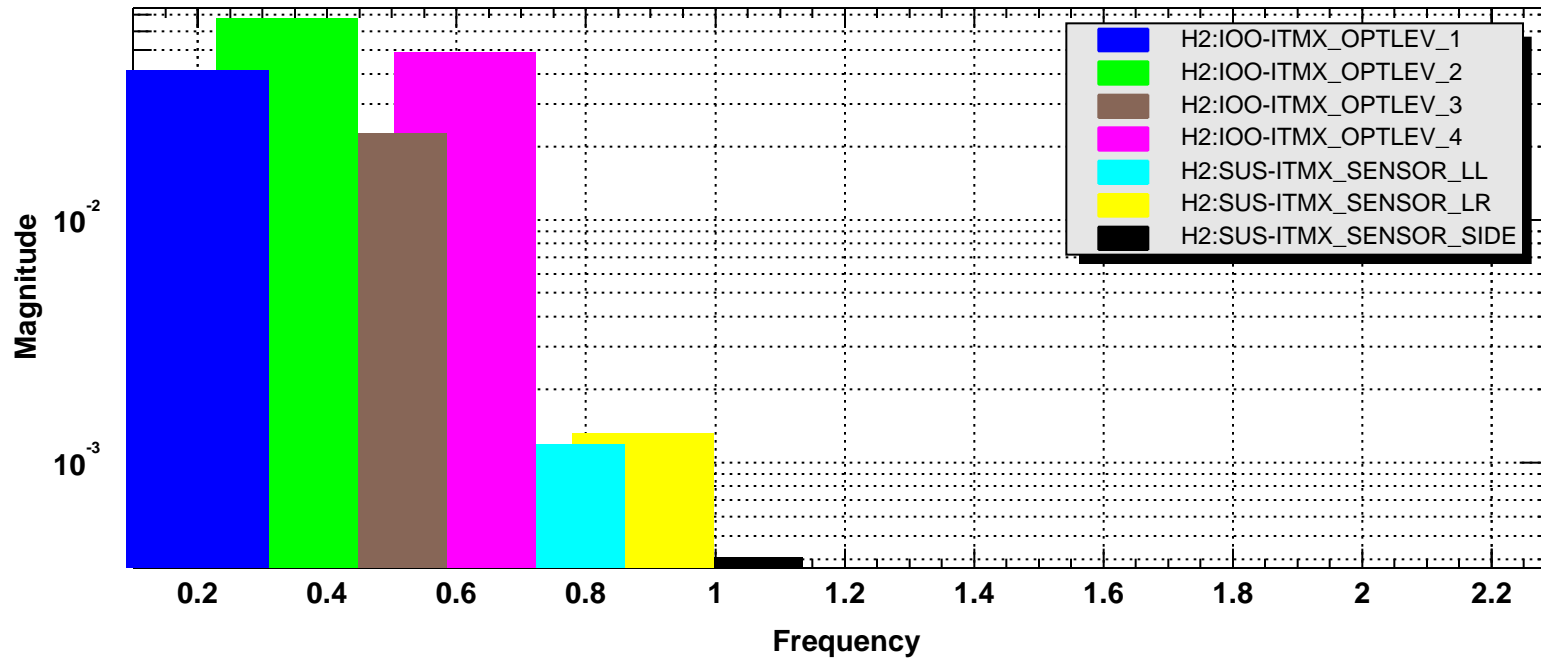
Transfer function



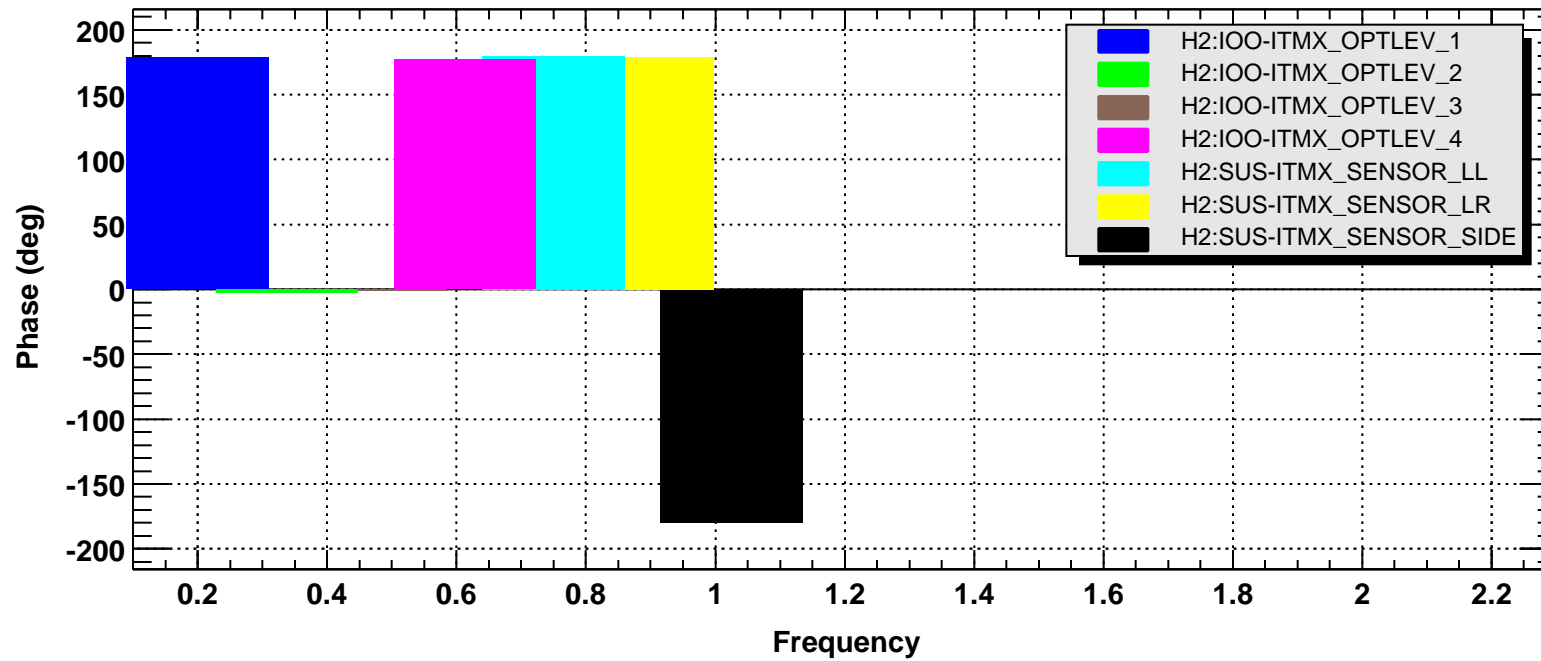
Transfer function



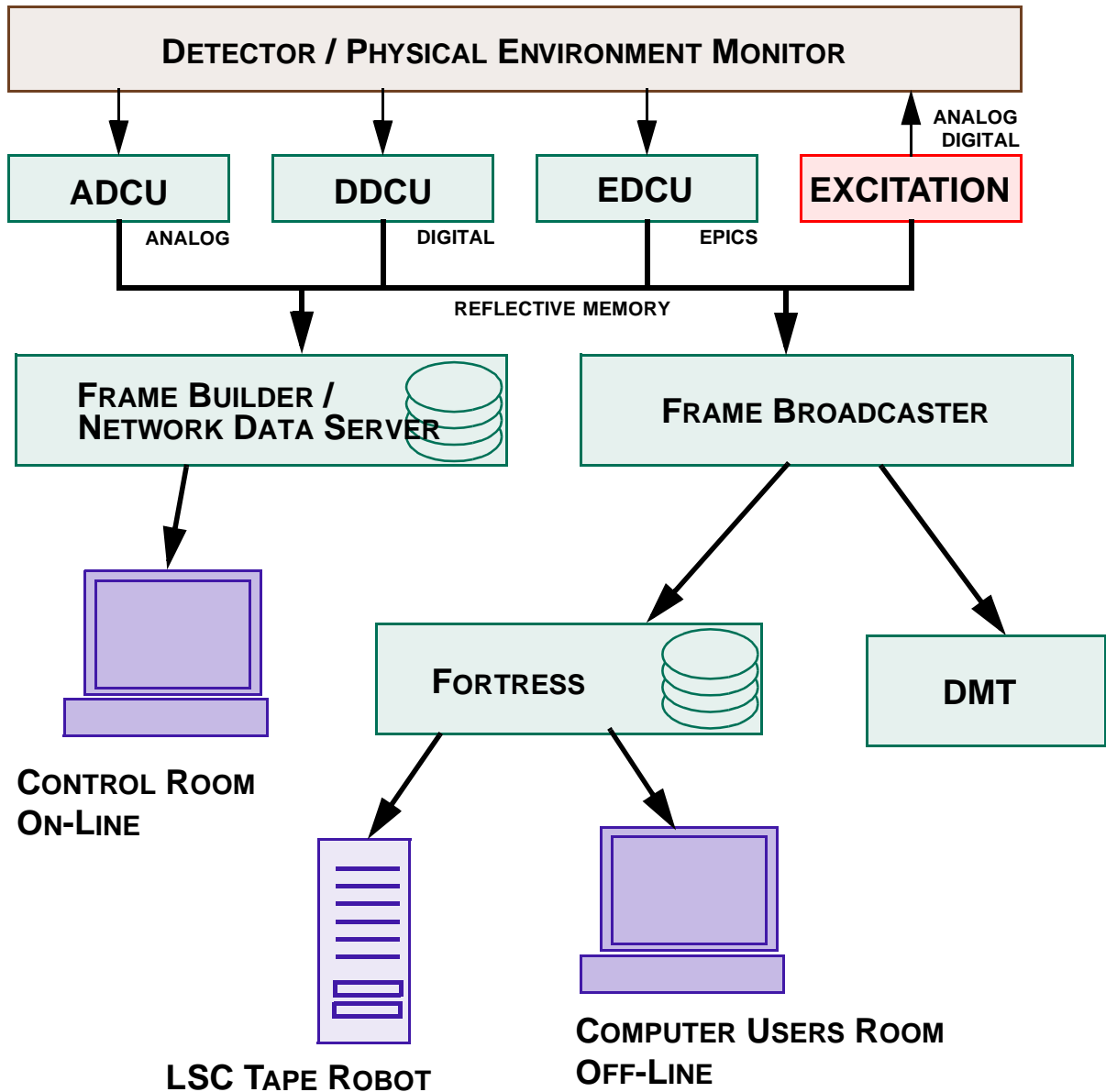
Transfer coefficients



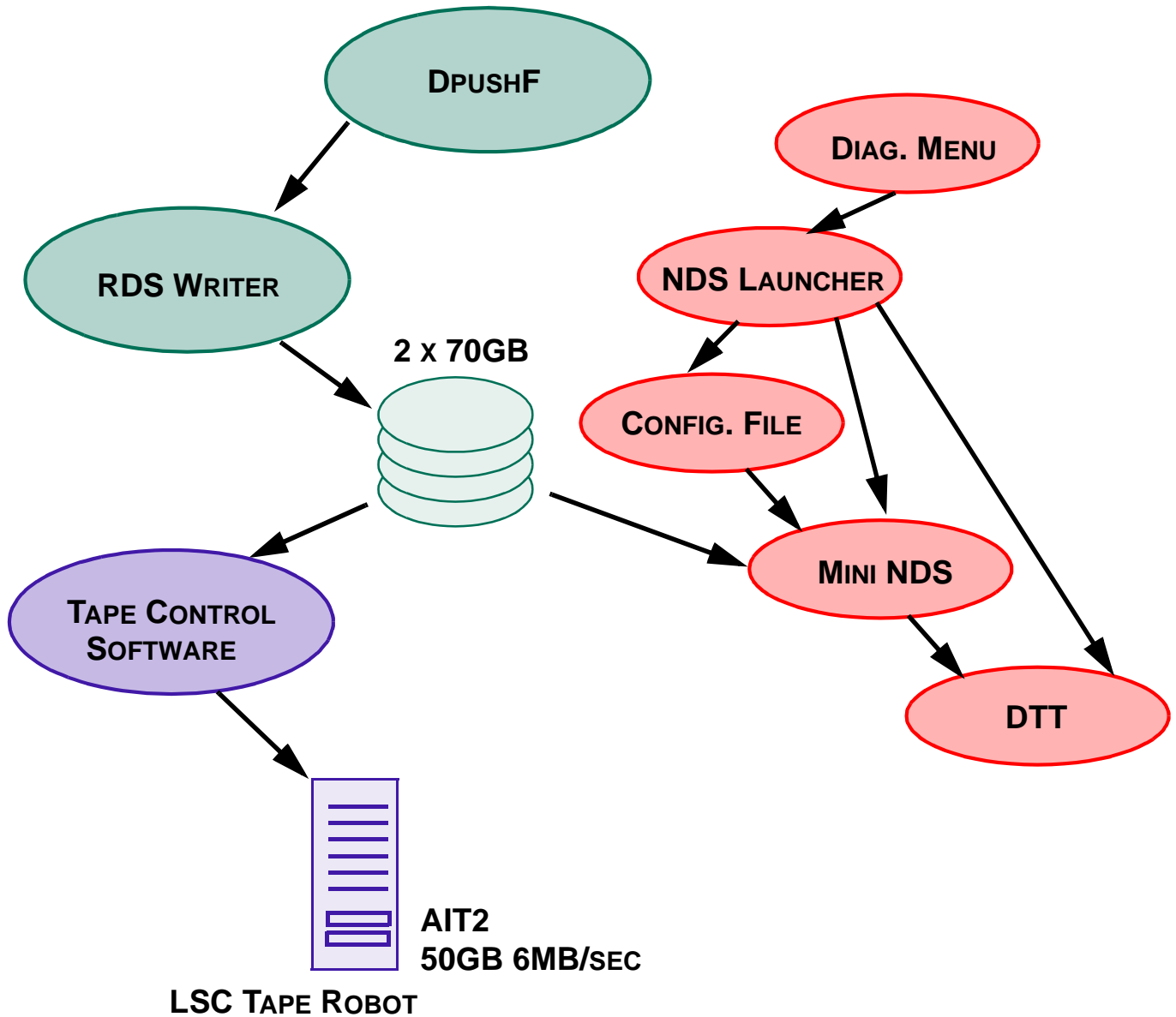
Transfer coefficients



HARDWARE SETUP



FORTRESS



Arbitrary Waveform Generator

File Status

Help

Channel:

Waveform Data File:

Periodic

Low/Sample

f A V

Offset V Phase

High

f A V

Rate

f

Ratio

%

Waveform

Sine Square Ramp Triangle Offset Uniform Normal Arbitrary Sweep

Sweep

Type

Linear Log

Direction

Up Down Up/Down

Trigger

Single Auto

Measurement | Excitation | Result | Iterator | Synchronization | Environment | Defaults

Measurement Selection

- Fourier Tools Swept Sine Response Sine Response Triggered Time Response
- Channels 0 to 19 Channels 20 to 39 Channels 40 to 59 Channels 60 to 79 Channels 80 to 99

Measurement Channels

0 <input checked="" type="checkbox"/>	H2:LSC-AS_Q_TEMP	5 <input type="checkbox"/>		10 <input type="checkbox"/>		15 <input type="checkbox"/>	
1 <input checked="" type="checkbox"/>	H2:LSC-AS_I_TEMP	6 <input type="checkbox"/>		11 <input type="checkbox"/>		16 <input type="checkbox"/>	
2 <input checked="" type="checkbox"/>	H2:IOO-MCA_OUT_MON	7 <input type="checkbox"/>		12 <input type="checkbox"/>		17 <input type="checkbox"/>	
3 <input type="checkbox"/>		8 <input type="checkbox"/>		13 <input type="checkbox"/>		18 <input type="checkbox"/>	
4 <input type="checkbox"/>		9 <input type="checkbox"/>		14 <input type="checkbox"/>		19 <input type="checkbox"/>	

Fourier Tools

Start: Hz Stop: Hz BW: Hz Settling Time: %

Window: Overlap: % Remove mean Number of A channels:

Averages: Average Type: Fixed Exponential Accumulative

Start Time

- Now
- In the future: hh:mm:ss
- In the past: hh:mm:ss
- GPS: sec nsec
- Date/time: dd/mm/yy hh:mm:ss UTC

Measurement Information

Measurement Time:

Comment / Description:

Start

Pause

Resume

Abort

Repeat

Fourier tools

Measurement Excitation Result Iterator Synchronization Environment Defaults

Channel Selection

Channels 0 to 3 Channels 4 to 7 Channels 8 to 11 Channels 12 to 15 Channels 16 to 19

Channel 0

Active Channel: Readback Channel: Default None User:

Waveform: Waveform File:

Frequency: 100 Hz Amplitude: 0 Offset: 0 Phase: 0 deg Ratio: 50 %

Frequency Range: 10000 Hz Amplitude Range: 0

Channel 1

Active Channel: Readback Channel: Default None User:

Waveform: Waveform File:

Frequency: 100 Hz Amplitude: 0 Offset: 0 Phase: 0 deg Ratio: 50 %

Frequency Range: 10000 Hz Amplitude Range: 0

Channel 2

Active Channel: Readback Channel: Default None User:

Waveform: Waveform File:

Frequency: 100 Hz Amplitude: 0 Offset: 0 Phase: 0 deg Ratio: 50 %

Frequency Range: 10000 Hz Amplitude Range: 0

Channel 3

Active Channel: Readback Channel: Default None User:

Waveform: Waveform File:

Frequency: 100 Hz Amplitude: 0 Offset: 0 Phase: 0 deg Ratio: 50 %

Frequency Range: 10000 Hz Amplitude Range: 0

Start

Pause

Resume

Abort

Repeat

Fourier tools

Graph: Power spectrum

0 1 2 3 4 5 6 7

Active

Channels

A: H2:100-MCA_OUT_MON

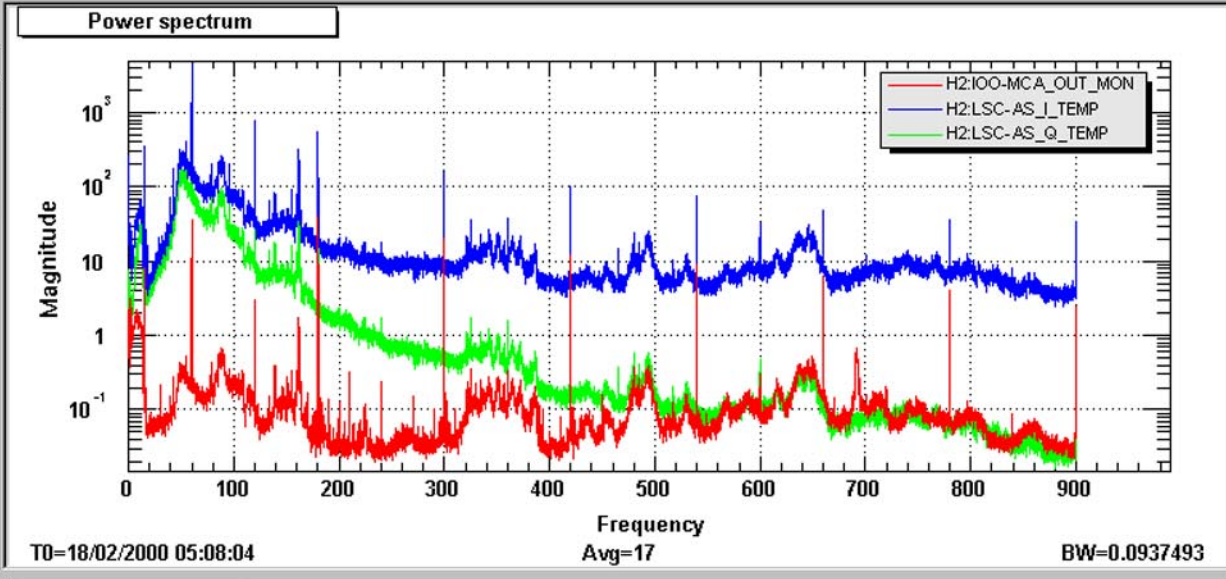
B:

Style

Line █ solid 1.0

Symbol █ circle 1.0

Bar █ solid 0.10



Trace: 0 1 2 3 4 5 6 7

Active

1 None Vert. Abs.

2 Cross Horiz. Delta

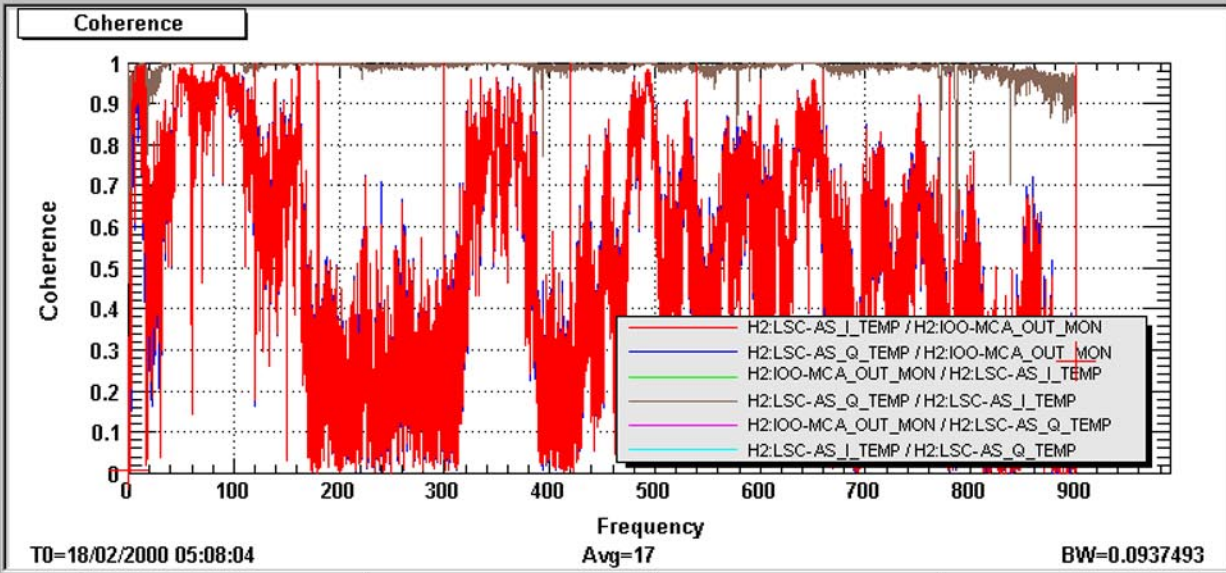
Values

X1: 0 Y1: 0.00767307

X2: 900 Y2: 0.271356

Statistics

X/Y diff 900 0.263682



Zoom Active New Options... Export... Print...

Start Pause Resume Abort

Repeat Fourier tools


```

<?xml version="1.0"?>
<!DOCTYPE LIGO_LW SYSTEM "http://www.cacr.caltech.edu/projects/ligo_1
<LIGO_LW Name="Diagnostics Test">
  <LIGO_LW Name="Header" Type="Global" Flag="TestParameters">
    <Param Name="Creator" Type="string">Diagnostics system</Param>
    <Param Name="TestType" Type="string">FFT</Param>
    <Param Name="TestName" Type="string">1998-2000, by Daniel Sigg</P
    <Param Name="Supervisory" Type="string">Standard</Param>
    <Param Name="TestIterator" Type="string">Repeat</Param>
    <Time Name="TestTime" Type="GPS">636091776000000000</Time>
    <Time Name="TestTimeUTC" Type="ISO-8601">2000-03-03 04:09:23</Tim
    <Param Name="Comment" Type="string"></Param>
  </LIGO_LW>
  <LIGO_LW Name="Test" Type="TestParameter" Flag="TestParameters">
    <Param Name="ObjectType" Type="string">TestParameter</Param>
    <Param Name="Subtype" Type="string">FFT</Param>
    <Param Name="StartFrequency" Type="double" Unit="Hz">0.9</Param>
    <Param Name="StopFrequency" Type="double" Unit="Hz">1.4</Param>
    <Param Name="BW" Type="double" Unit="Hz">0.01</Param>
    <Param Name="Overlap" Type="double">0.5</Param>
    <Param Name="Window" Type="int">1</Param>
    <Param Name="RemoveDC" Type="boolean">>false</Param>
    <Param Name="AChannels" Type="int">0</Param>
    <Param Name="AverageType" Type="int">0</Param>
    <Param Name="Averages" Type="int">10</Param>
    <Param Name="SettlingTime" Type="double">0.1</Param>
    <Param Name="StimulusType[0]" Type="int">1</Param>
    ...
  </LIGO_LW>
  <LIGO_LW Name="Result[0]" Type="Spectrum" Flag="Result">
    <Param Name="ObjectType" Type="string">Spectrum</Param>
    <Param Name="Subtype" Type="int">1</Param>
    <Param Name="f0" Type="double" Unit="Hz">0.9</Param>
    <Param Name="df" Type="double" Unit="Hz">0.0078125</Param>
    <Time Name="t0" Type="GPS">636091776000000000</Time>
    <Param Name="dt" Type="double" Unit="s">0.0078125</Param>
    <Param Name="BW" Type="double" Unit="Hz">0.0117188</Param>
    <Param Name="Window" Type="int">1</Param>
    <Param Name="AverageType" Type="int">0</Param>
    <Param Name="Averages" Type="int">10</Param>
    <Param Name="N" Type="int">65</Param>
    <Param Name="M" Type="int">1</Param>
    <Param Name="ChannelA" Type="string" Unit="channel">H2:ASC-ITMX_P
    <Array Type="float">
      <Dim>65</Dim>
      <Stream Encoding="BigEndian,base64">
        PXFV2j2aNwY9yXHpPgcUET47CpU+hsnLPsyDNT8mLAA/1K7PQBn+WkDNU0NB89L7
        Q9VYm0QgAnRDaL3AQWi9tkCE/qI/4REoP2hS+D8HhQM+q+A9PmeiZD4jgaU972QC
        PbSBbT2Ldmo9W/HXPTB8KD0PzGQ87TokPMYSuDynC1s8jhb+PHPSCjxSpec8Nzgm
        PCBIPdWm7h47+VQp090pejvFbSw7sGr0056A1Tu0+Y87gV3o02py9TtUUVw7QT56
        0y/U8zsg40g7Esw20wbAIzr2qHE643by0s9Syjq/Bg46ryN30qEckjqUEKY6h1gU
        OnnZ5DpjFYo6Tv9k0jzJyzoreaE=
      </Stream>
    </Array>
  </LIGO_LW>
  ...
</LIGO_LW>

```

MAIN FEATURES

❑ Excitation

- 8kHz bandwidth: digital & analog
- sine, square, ramp, sweep, arbitrary, etc.

❑ Diagnostics Test Tool (DTT)

- Access to all on-line data
- Integrated excitation signal setup
- Fourier analysis, Swept sine, Sine response, Triggered time response
- Fully functional GUI, Integrated graphics
- Print: ps, pdf, eps, epsi, jpeg, ai
- Export: ASCII, binary
- File format (save/restore): LIGO-LW (XML based)

❑ Off-line

- Large disk (140GB)
- Tape robot
- Same software

It is ready!

