

DIAGNOSTICS TEST TOOL

LSC Livingston Meeting, March 2000

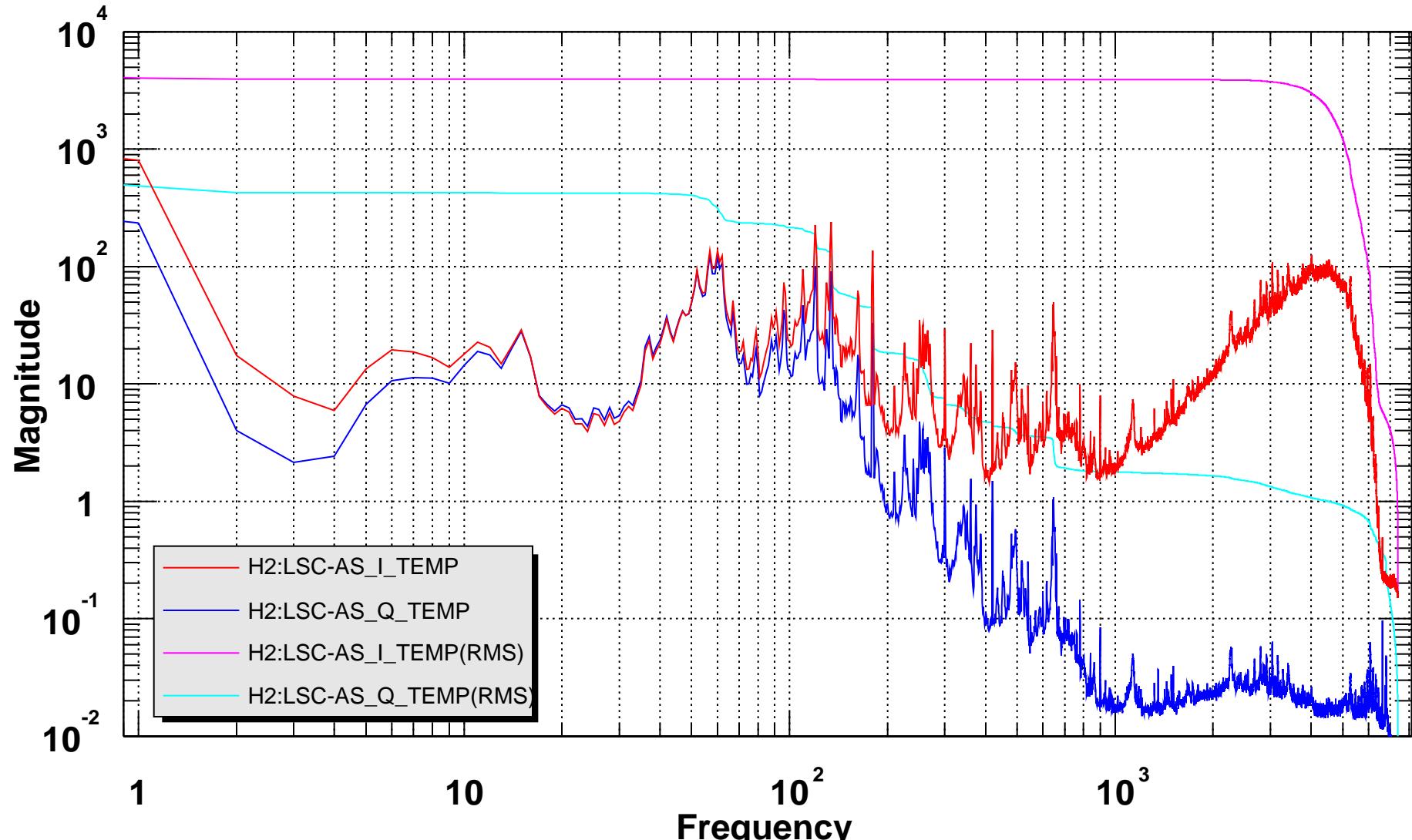
Daniel Sigg



1 of 4

LIGO-G000079-00-D

Power spectrum

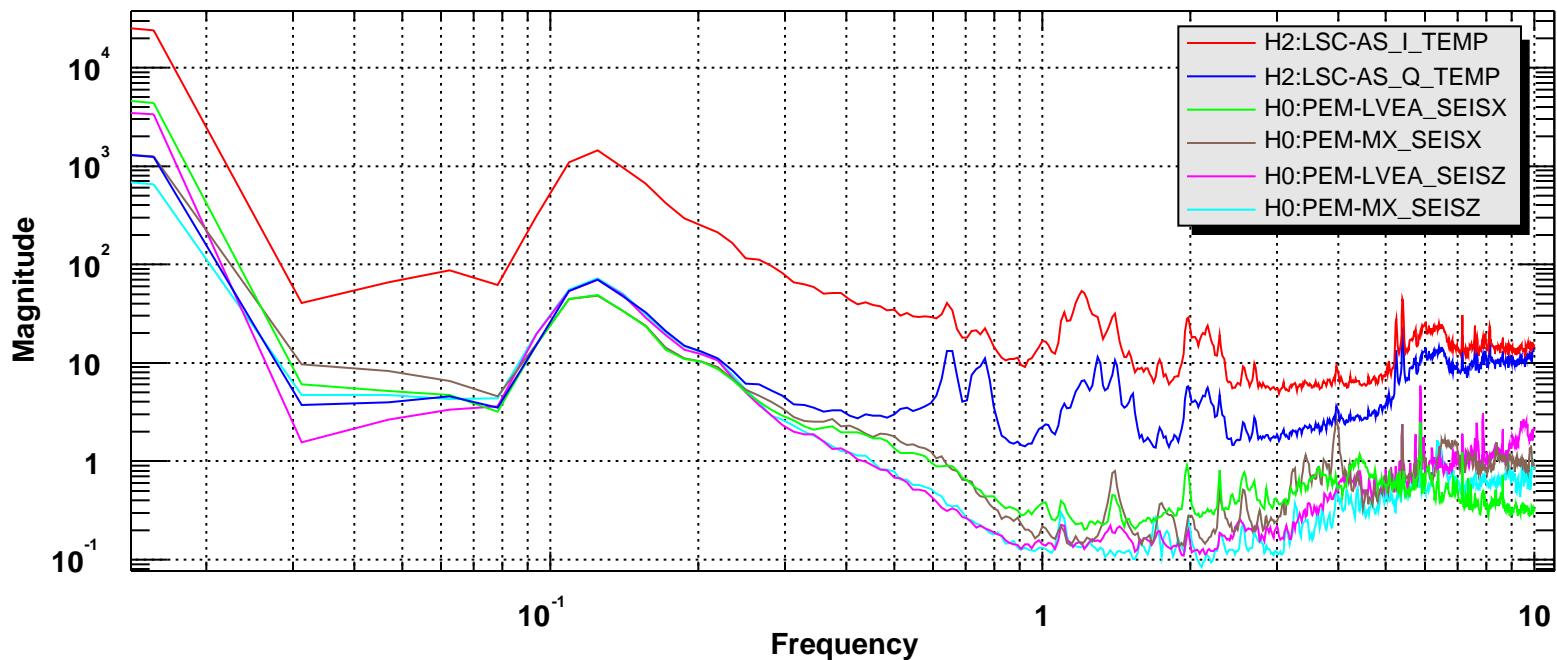


T0=03/03/2000 07:55:00

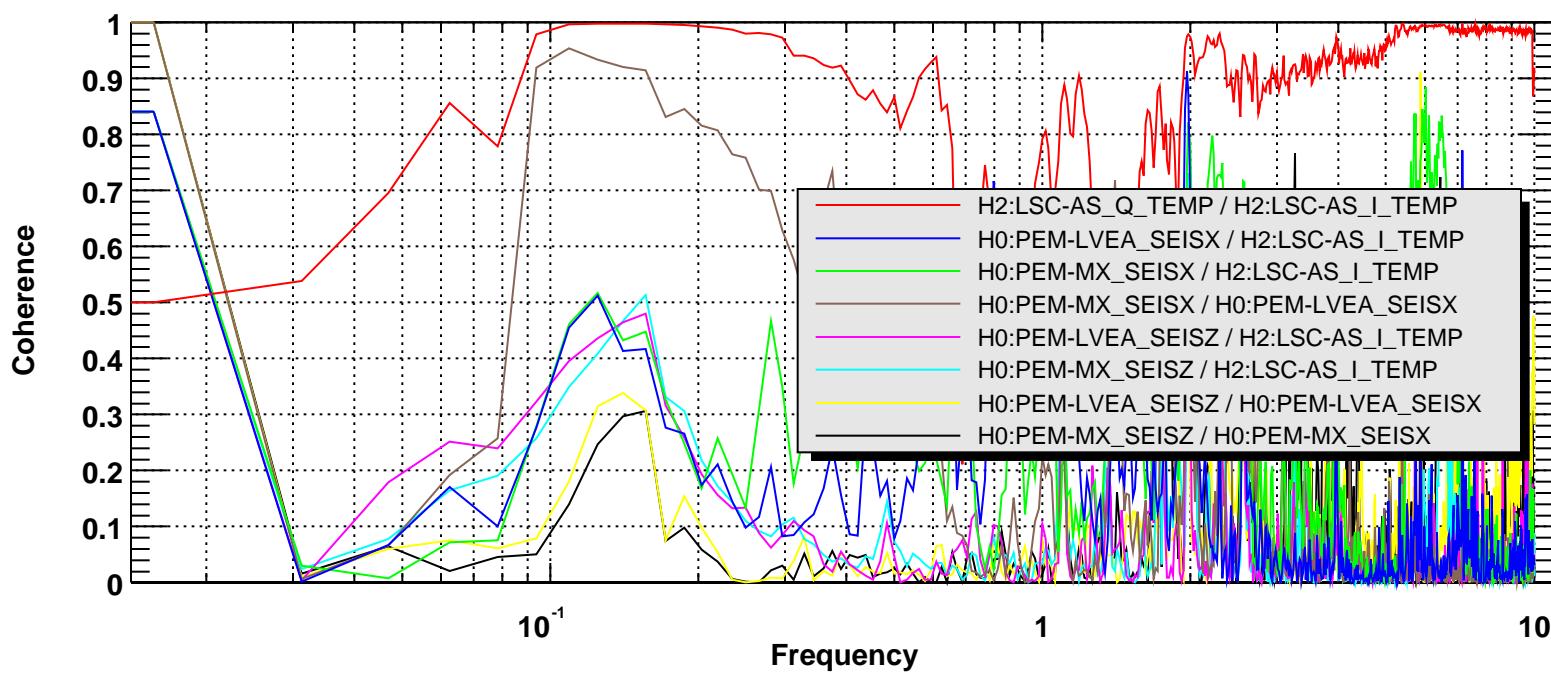
Avg=100

BW=1.49999

Power spectrum



Coherence

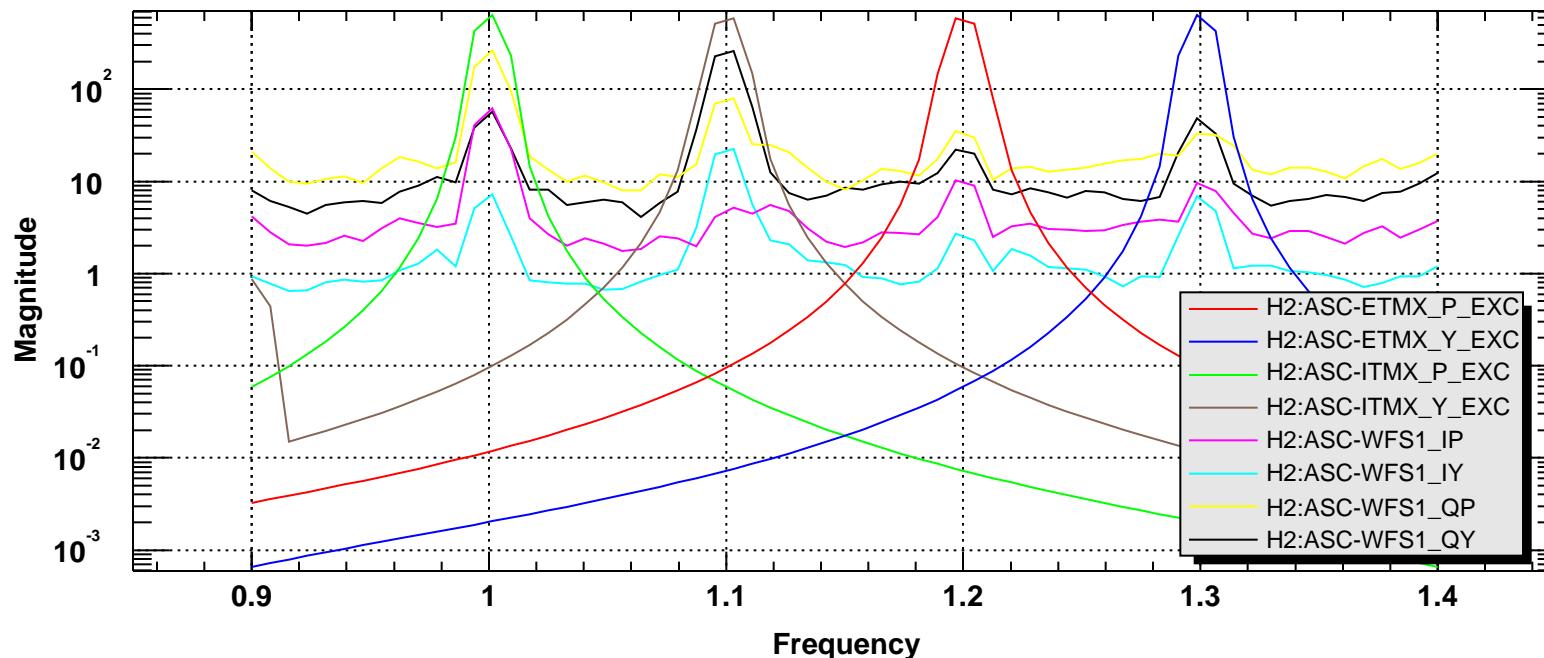


T0=03/03/2000 07:55:00

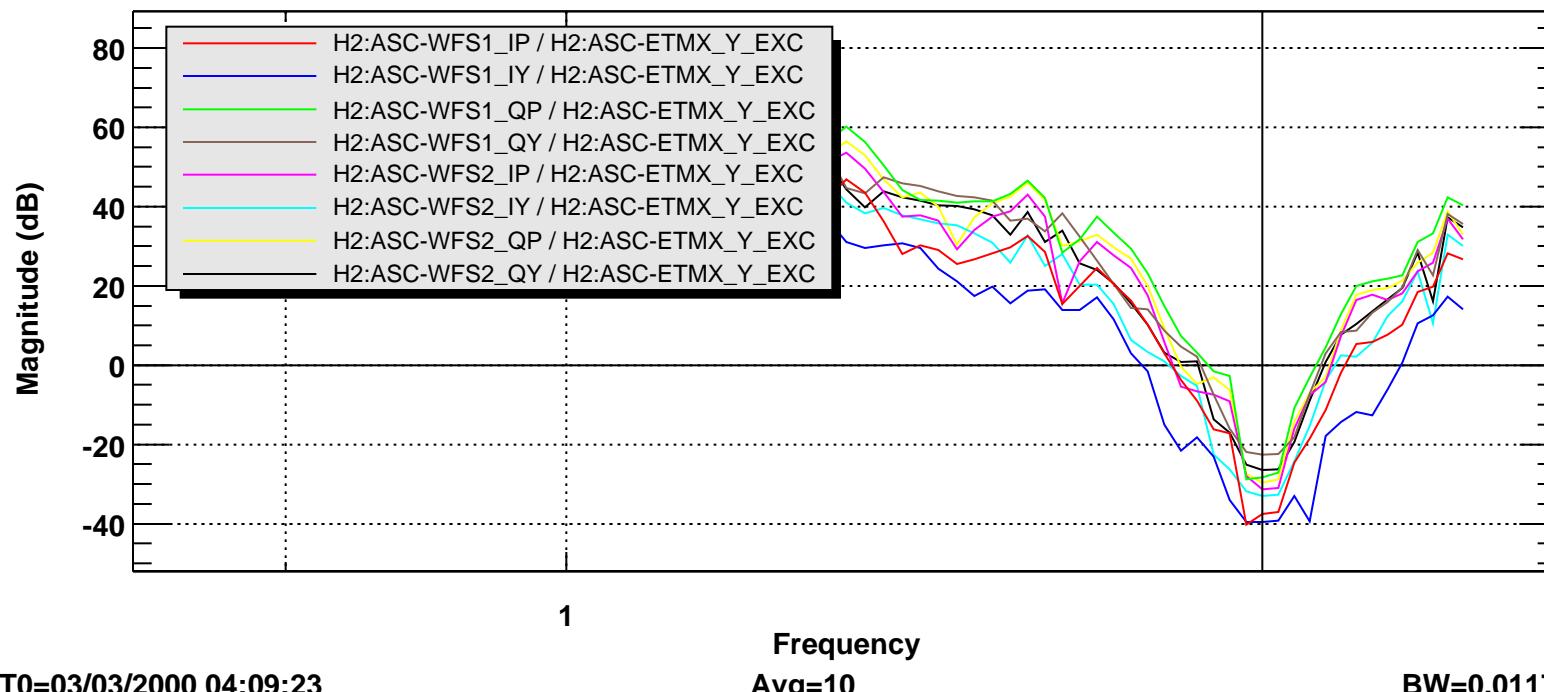
Avg=60

BW=0.0234375

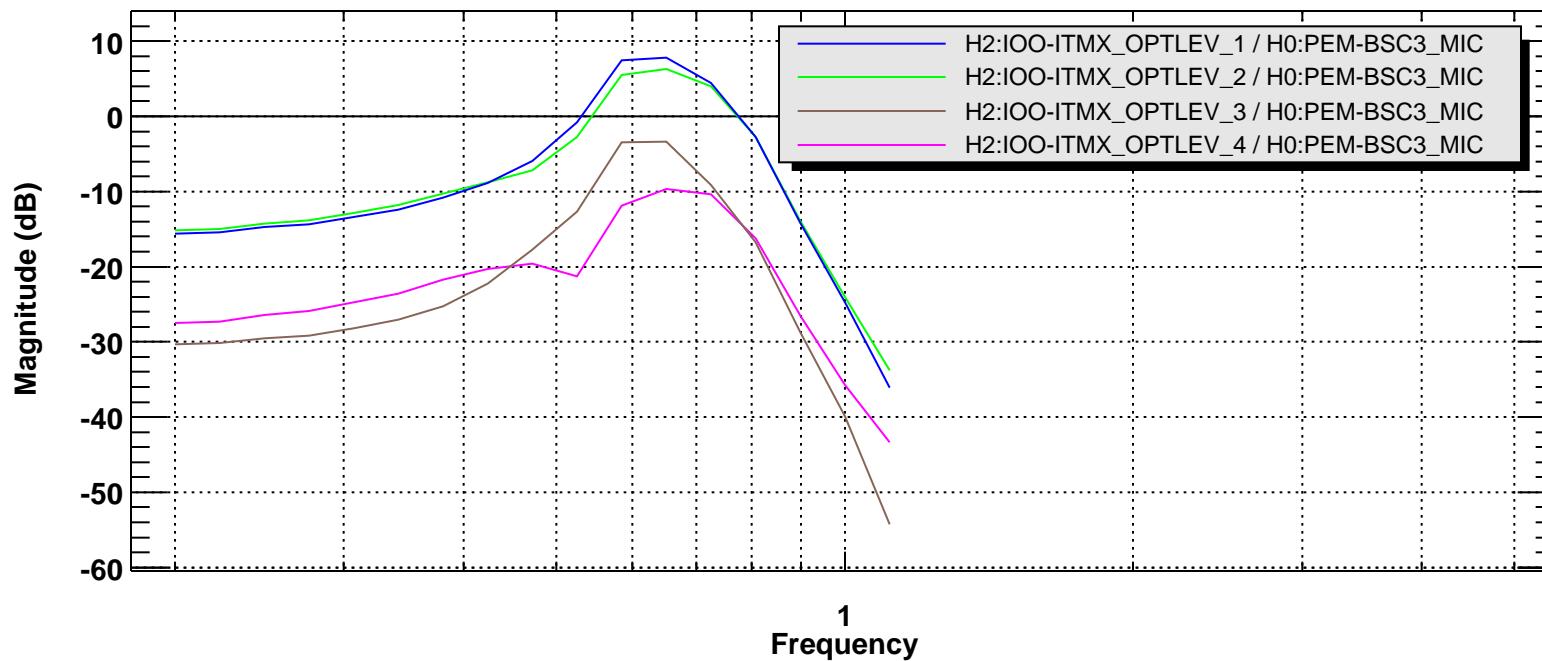
Power spectrum



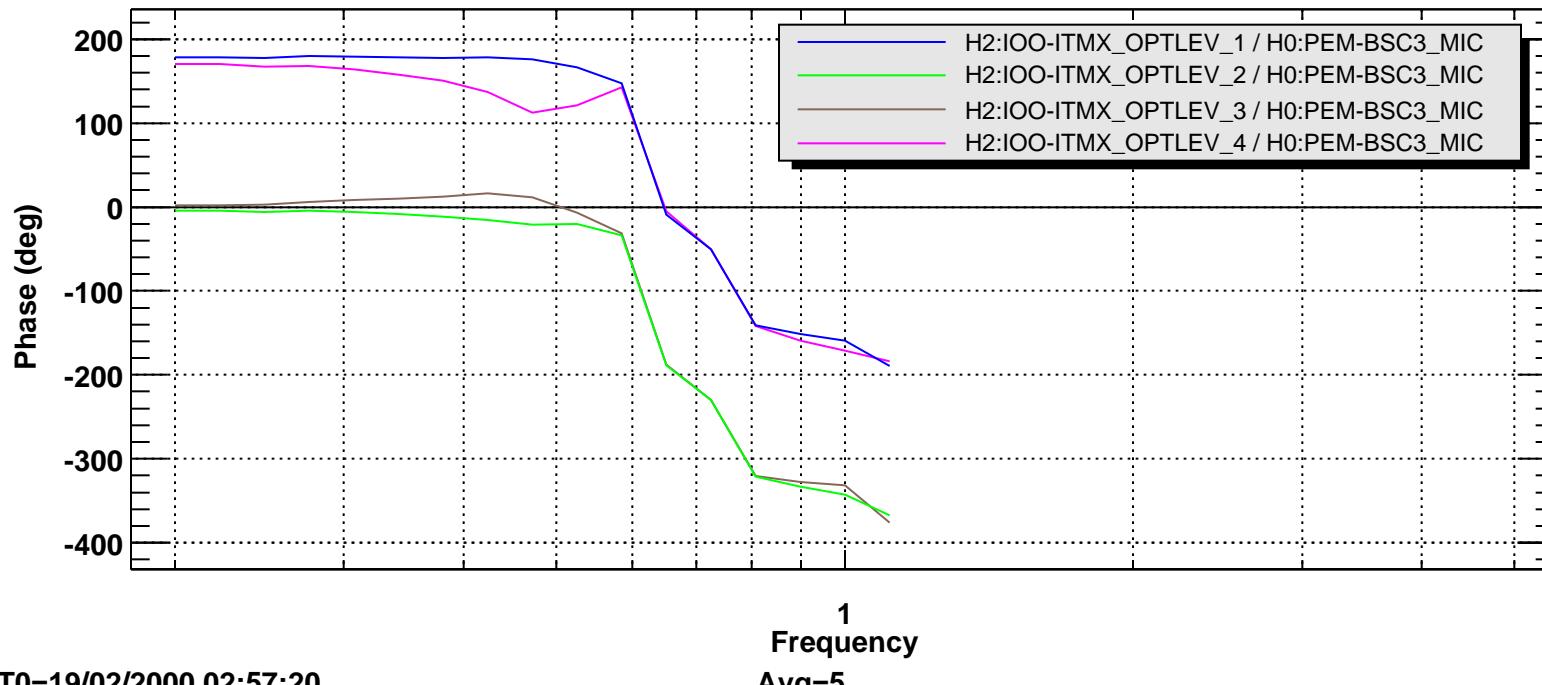
Transfer function



Transfer function



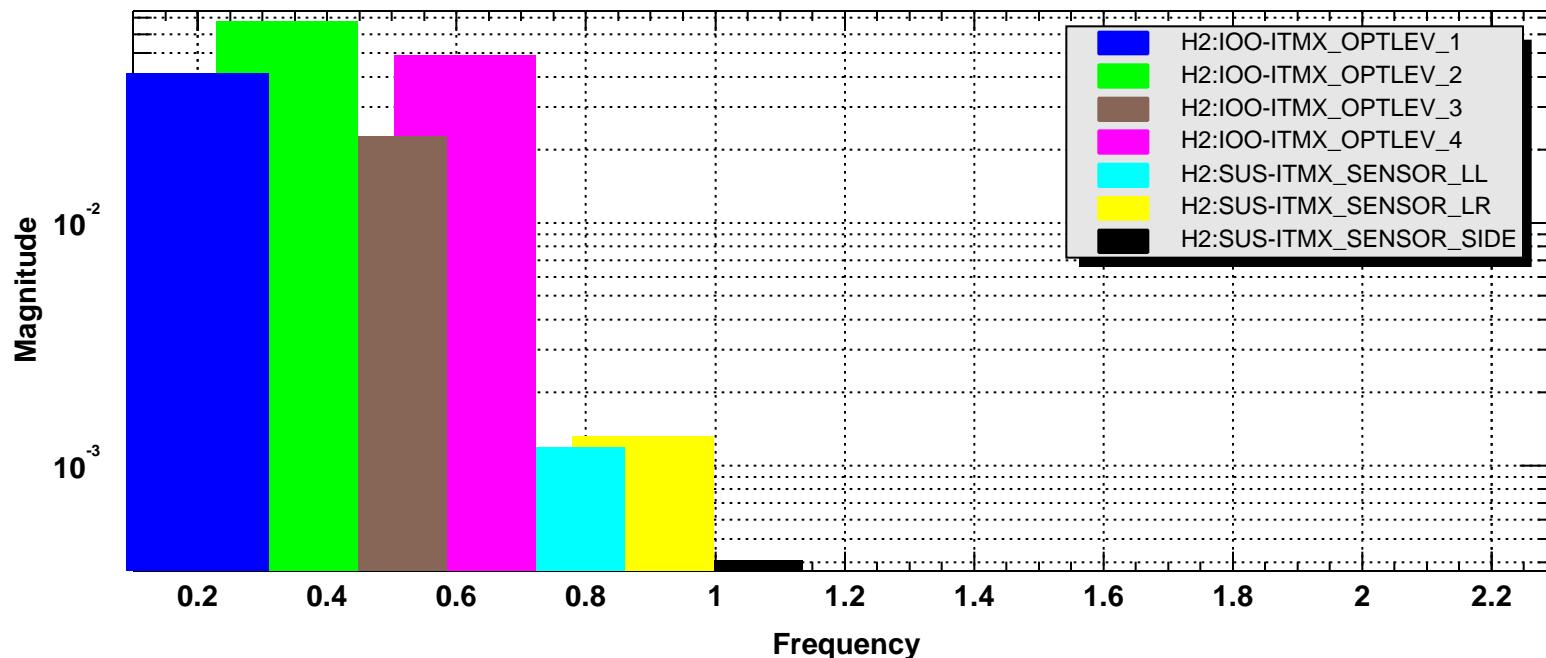
Transfer function



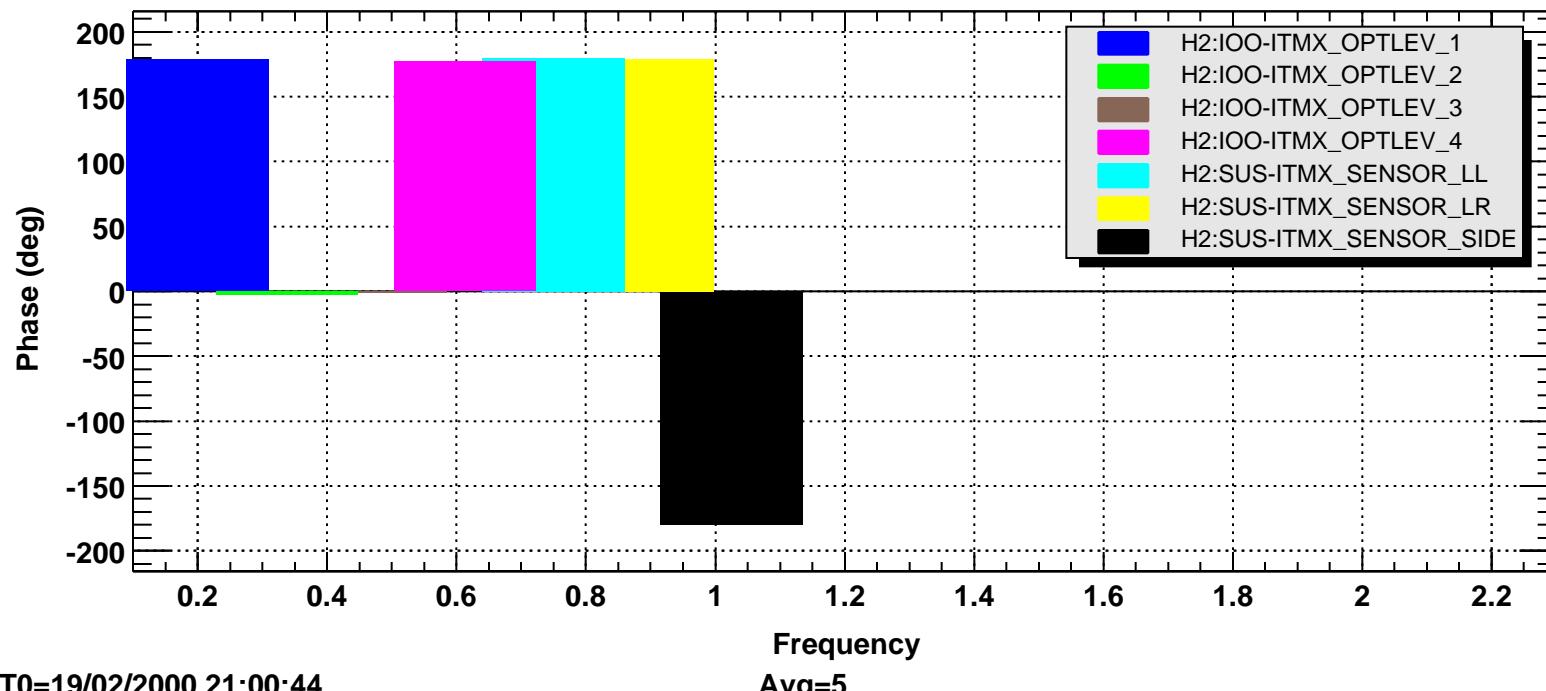
T0=19/02/2000 02:57:20

Avg=5

Transfer coefficients



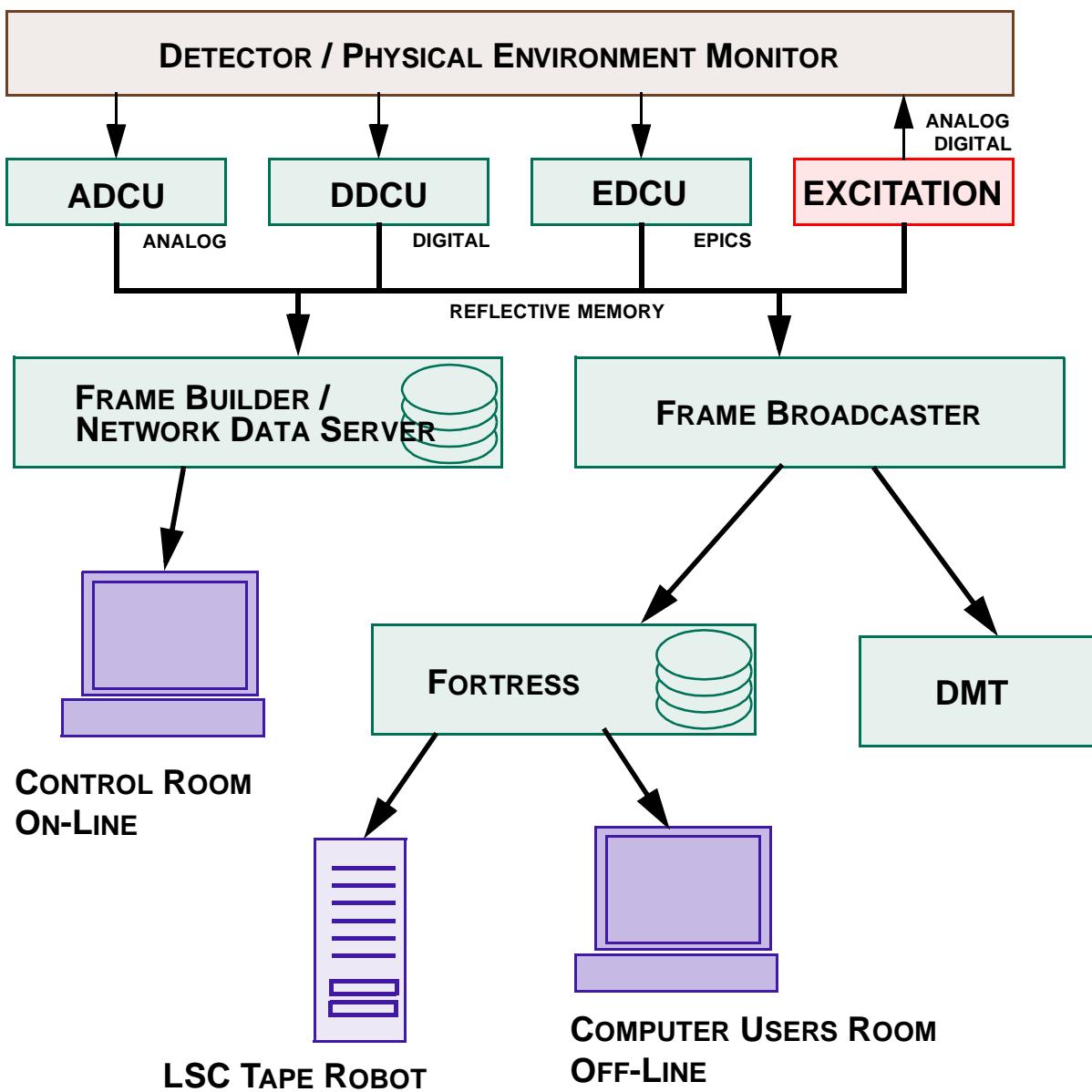
Transfer coefficients



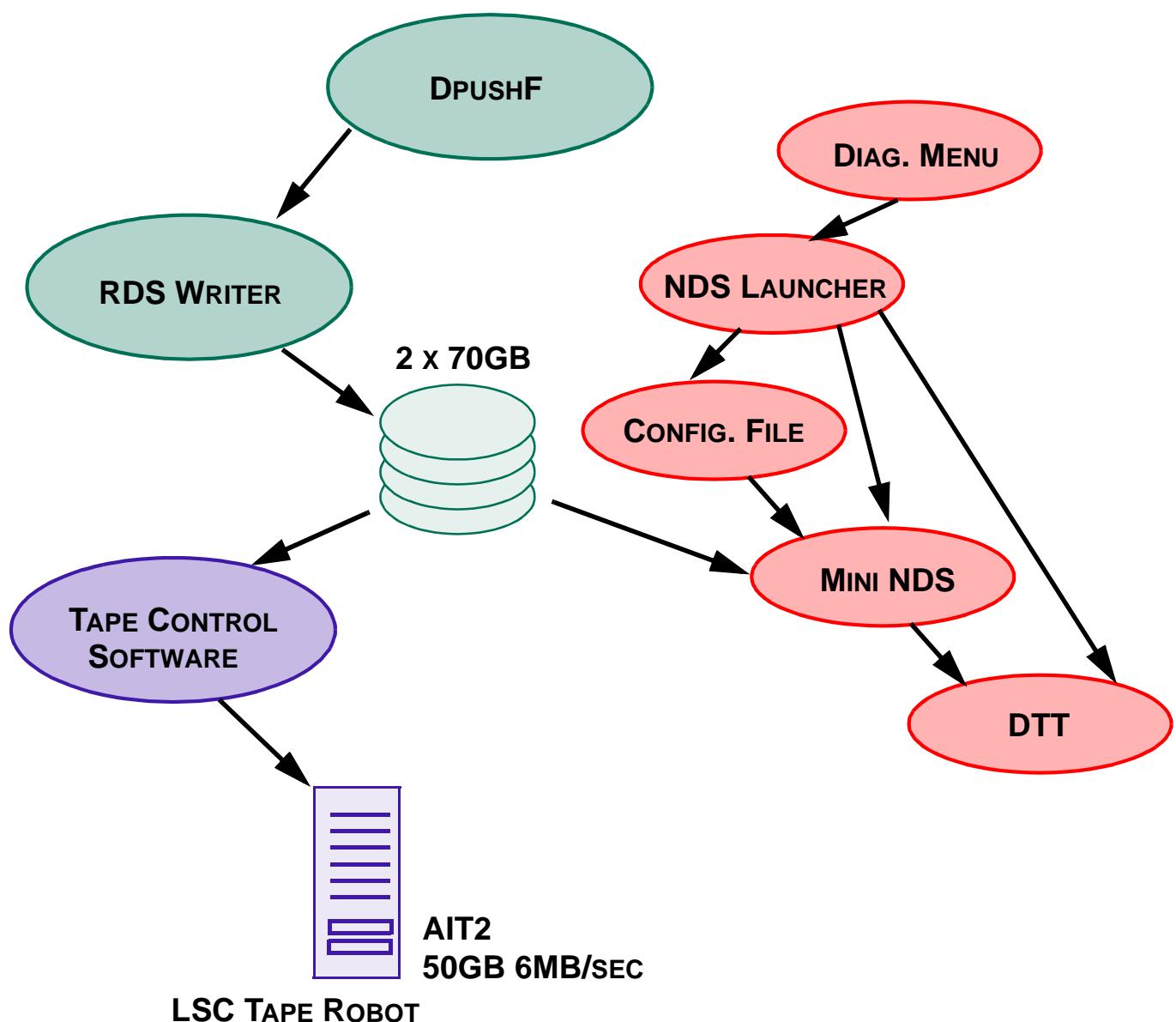
T0=19/02/2000 21:00:44

Avg=5

HARDWARE SETUP



FORTRESS



Arbitrary Waveform Generator

File Status

Help

Channel: H2:LSC-CARM_EXC

Waveform Data File: File Name

Load Waveform Data

Periodic

Low/Sample

f [12.5] Hz A [1.0] V

Offset [0.0] V Phase [0.0] Rad

High

f [0.0] Hz A [0.0] V

Rate

f [0.0] Hz

Ratio

% [50.0]

Waveform

Sine Square Ramp Triangle Offset Uniform Normal Arbitrary Sweep

Sweep

Type

Linear Log

Direction

Up Down Up/Down

Trigger

Single Auto

Set/Run

Clear/Stop

Trigger

Exit

Diagnostics test tools – /opt/CDS/e/dtt/daniel/lock_000218_050748_mca.xml

File Edit Measurement Utilities Help

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: 0 Hz Stop: 900 Hz BW: 0.062 Hz Settling Time: 0.0 %
Window: Hanning Overlap: 50.0 % Remove mean Number of A channels: 3
Averages: 18 Average Type: Fixed Exponential Accumulative

Start Time

Now
 In the future: 0:00:00 hh:mm:ss
 In the past: 0:00:00 hh:mm:ss
 GPS: 636353298 sec 0 nsec
 Date/time: 6/3/2000 dd/mm/yy 4:48:05 hh:mm:ss UTC

Measurement Information

Measurement Time: 18/02/2000 05:08:04 UTC

Comment / Description:

Start Pause Resume Abort Repeat Fourier tools

Diagnostics test tools – /opt/CDS/e/dtt/daniel/lock_000218_050748_mca.xml

File Edit Measurement Utilities Help

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

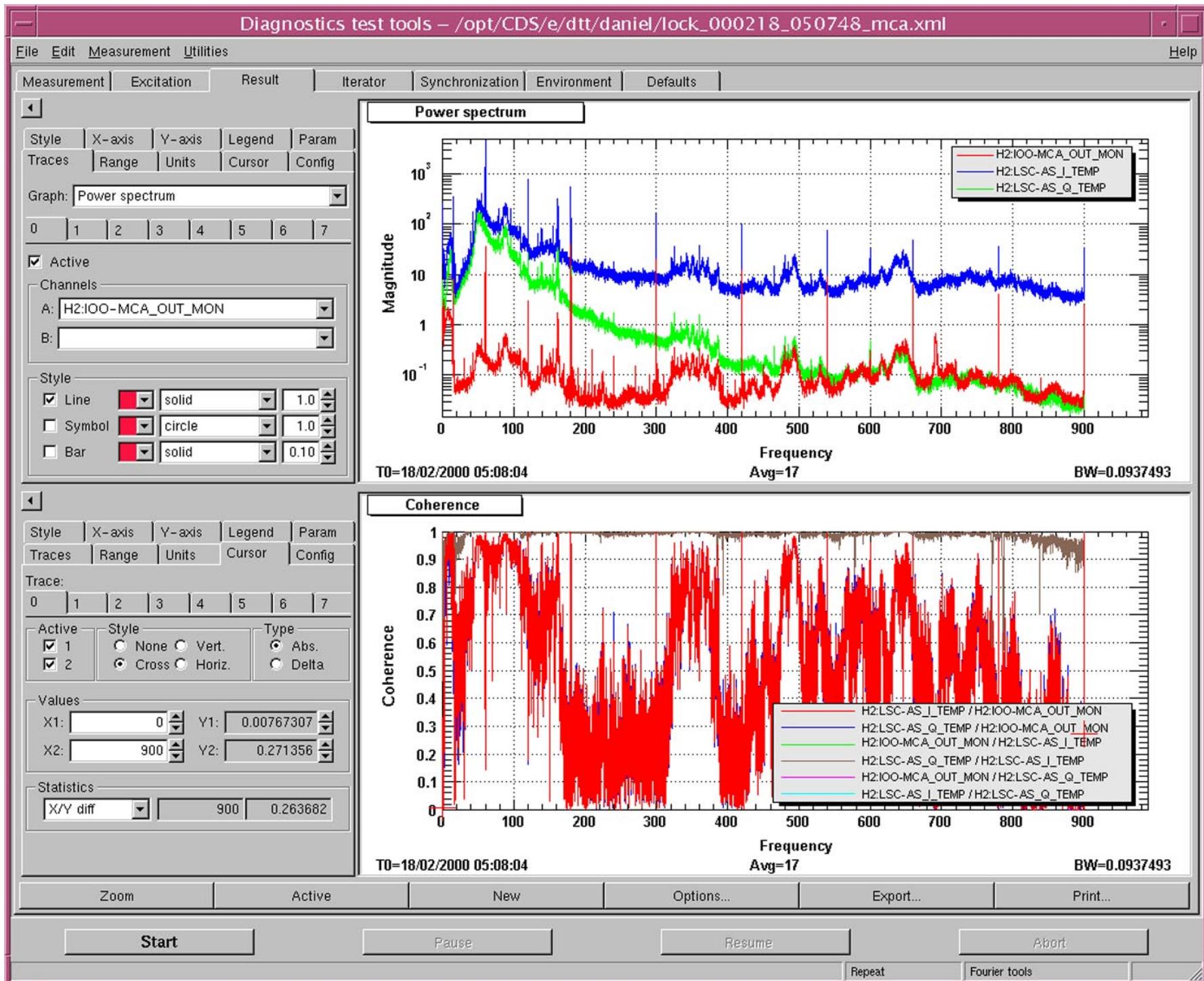
Channel 0
 Active Channel: Readback Channel: Default None User:
Waveform: None Choose...
Frequency: 100 Hz Amplitude: 0 Offset: 0 Phase: 0 deg Ratio: 50 %
Frequency Range: 10000 Hz Amplitude Range: 0

Channel 1
 Active Channel: Readback Channel: Default None User:
Waveform: None Choose...
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: None Choose...
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: None Choose...
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



Diagnostics tests

Window Edit Options

Help

Text Editor – test1.xml

File Edit Format Options Help

```
<?xml version="1.0"?>
<!DOCTYPE LIGO_LW SYSTEM "http://www.cacr.caltech.edu/projects/ligo_lw">
<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</Param>
    <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</Time>
    <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="to" 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+PHPSjxSpec8NzgM
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Oy/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!

