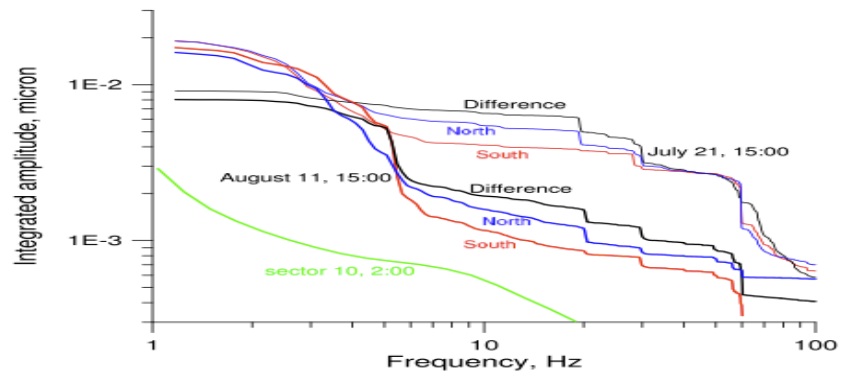
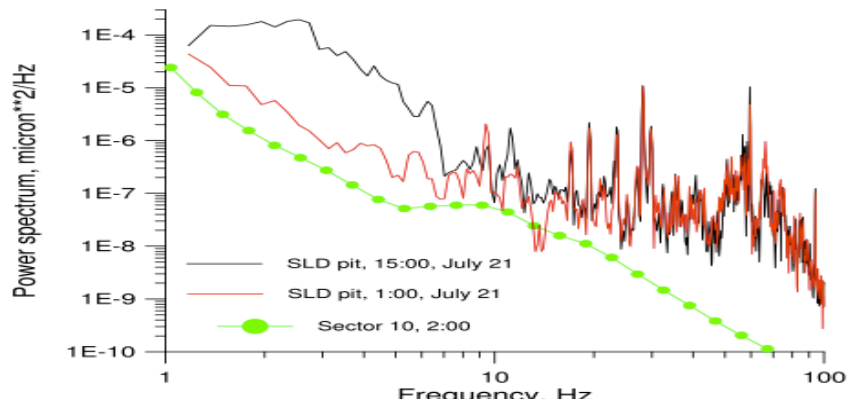


Vibration Spectra and Correlation Measurements in SLD Detector Hall

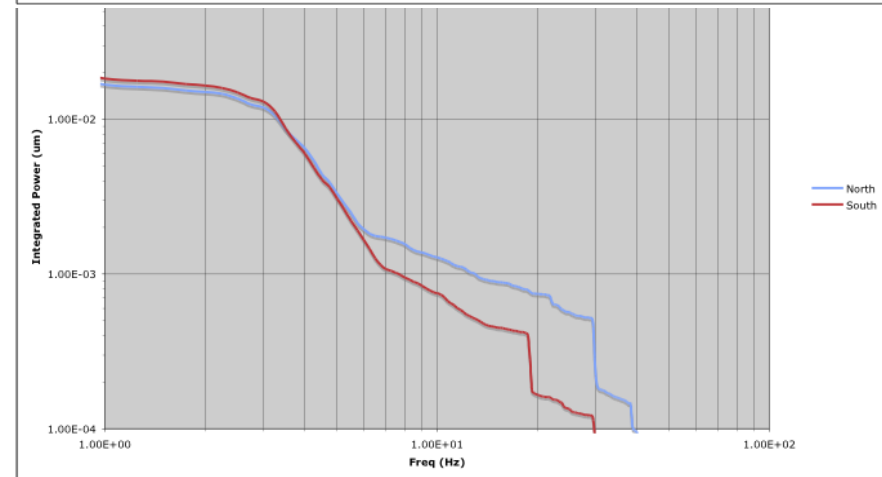
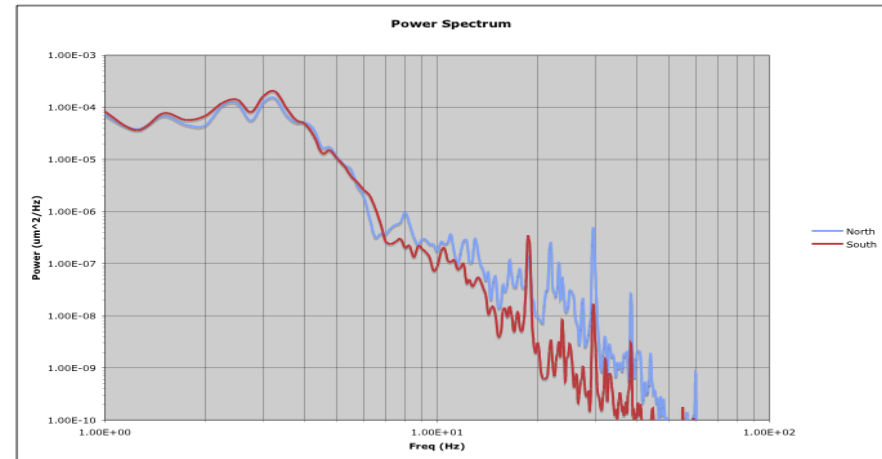
K. Bertsche

11-3-2011

Power Spectra in Pit

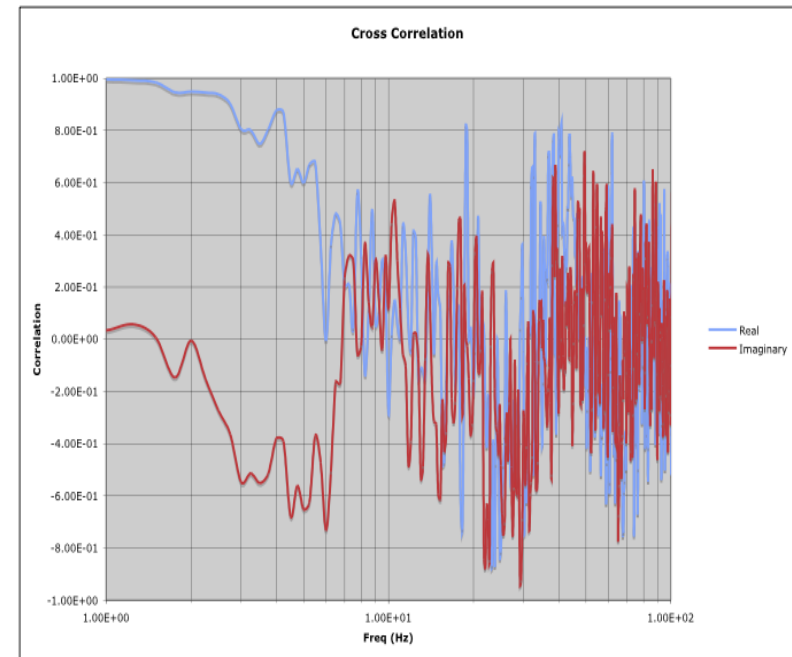
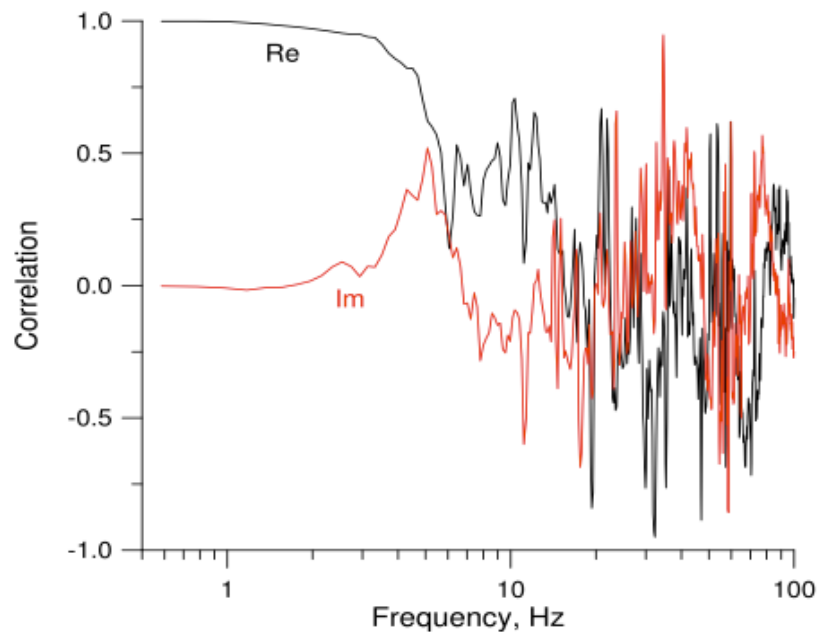


- Seryi, Breidenbach, Frisch, SLAC-PUB-8594 (2000)



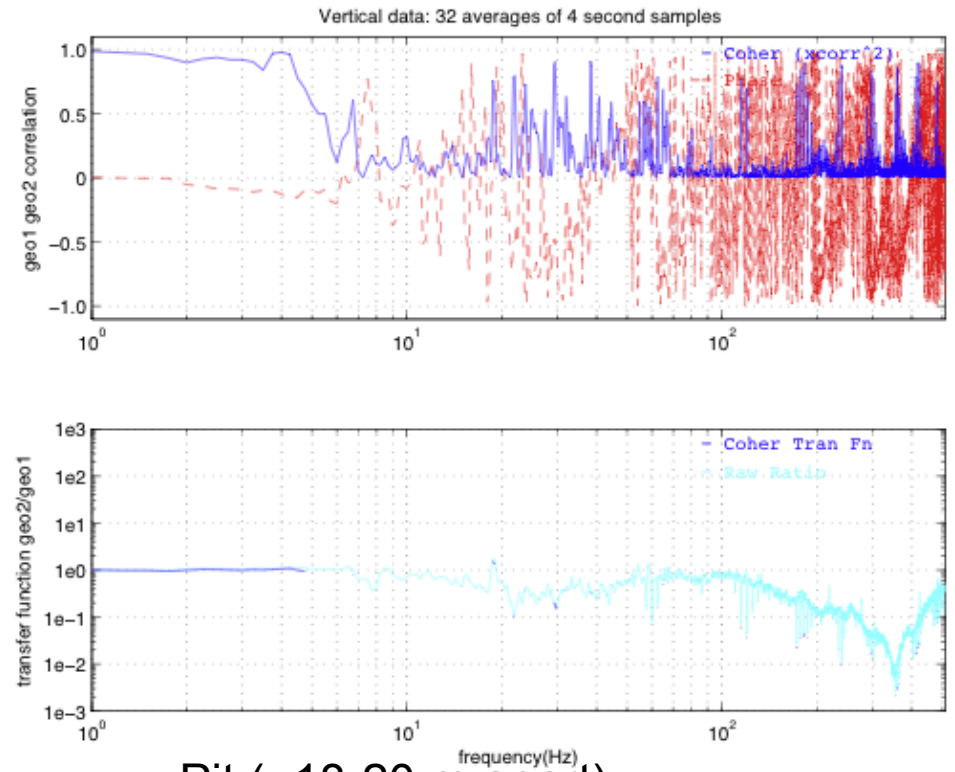
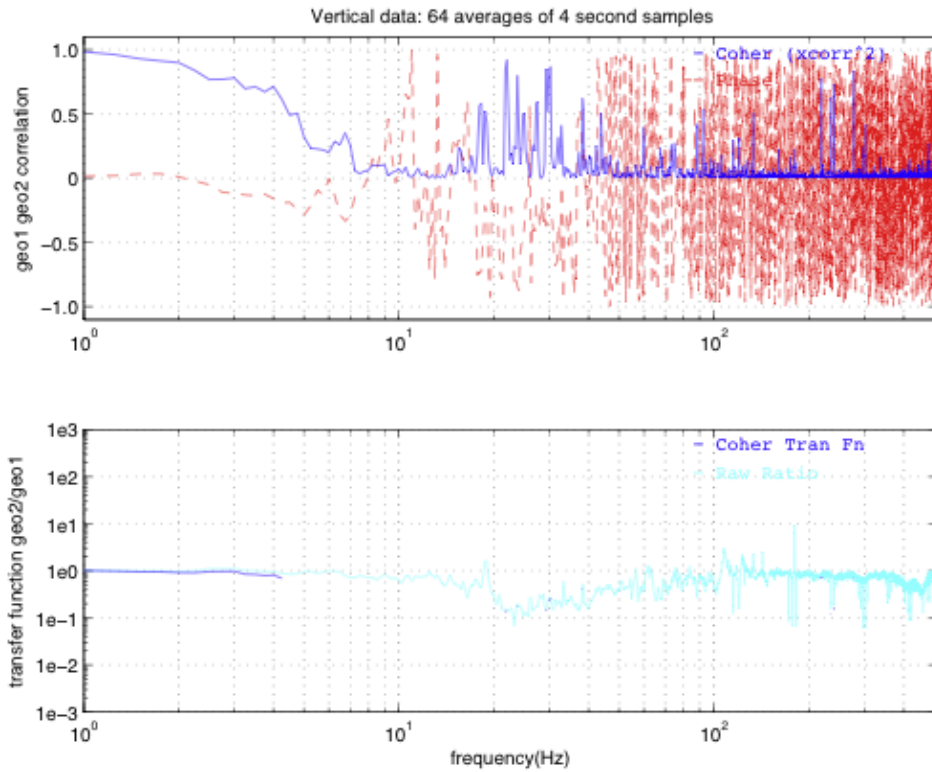
- #28153650, 10-28-2011, ~15:30

Correlation in Pit



- Seryi, Breidenbach, Frisch, SLAC-PUB-8594 (2000)
- #28153650, 10-28-2011, ~15:30
- Note: Real = 0 @ ~ 6 Hz for both (is this ~ $\lambda/4$?)

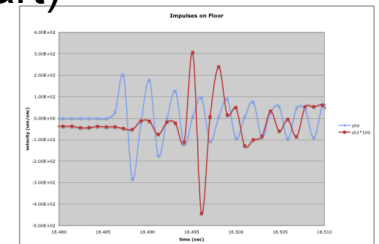
Tunnel vs Pit



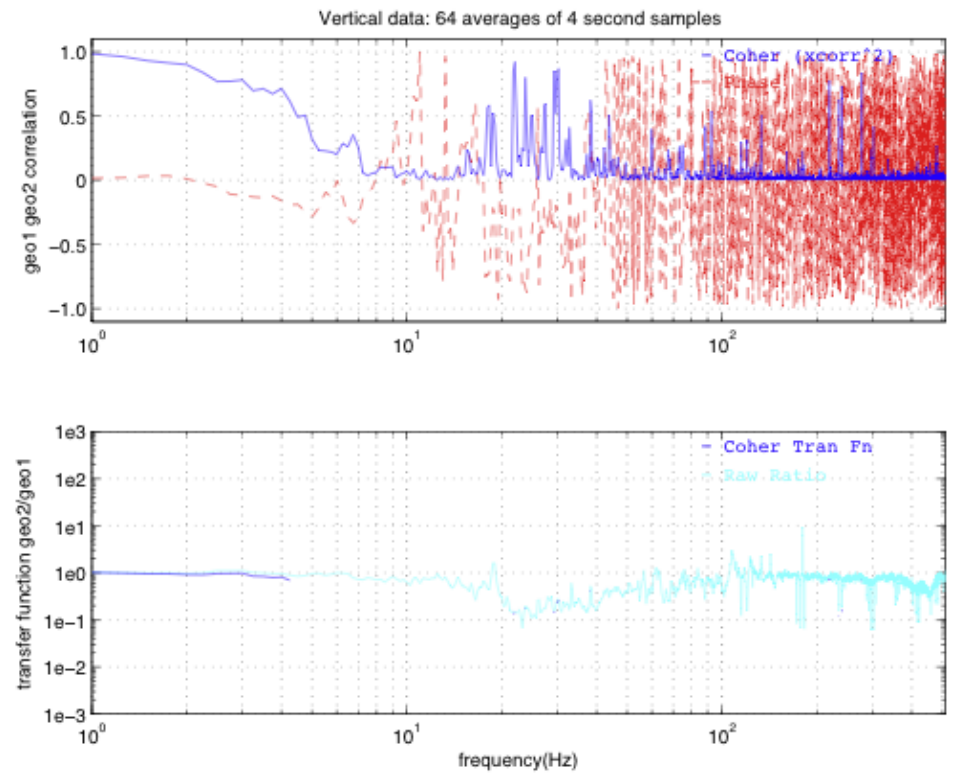
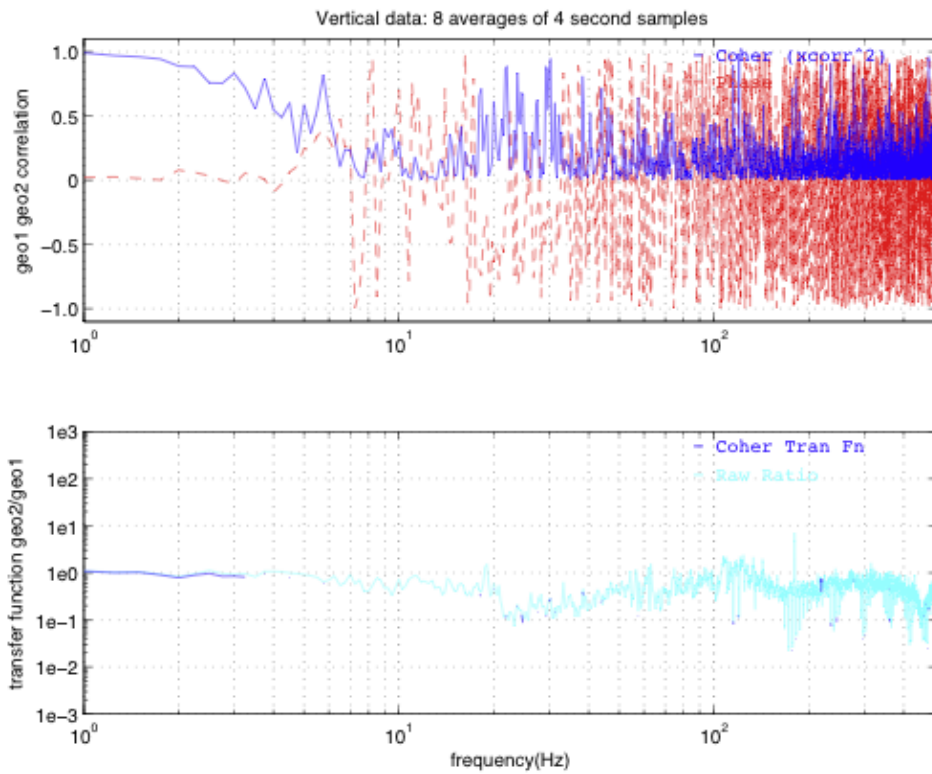
- Tunnel (~22 m apart, across pit)

- Shorter baseline in pit: correlation to higher freq
- Sound velocity ~600 m/s? (dispersive, hard to measure)
- Correlated to ~0.1-0.2 λ ?

- Pit (~18-20 m apart)

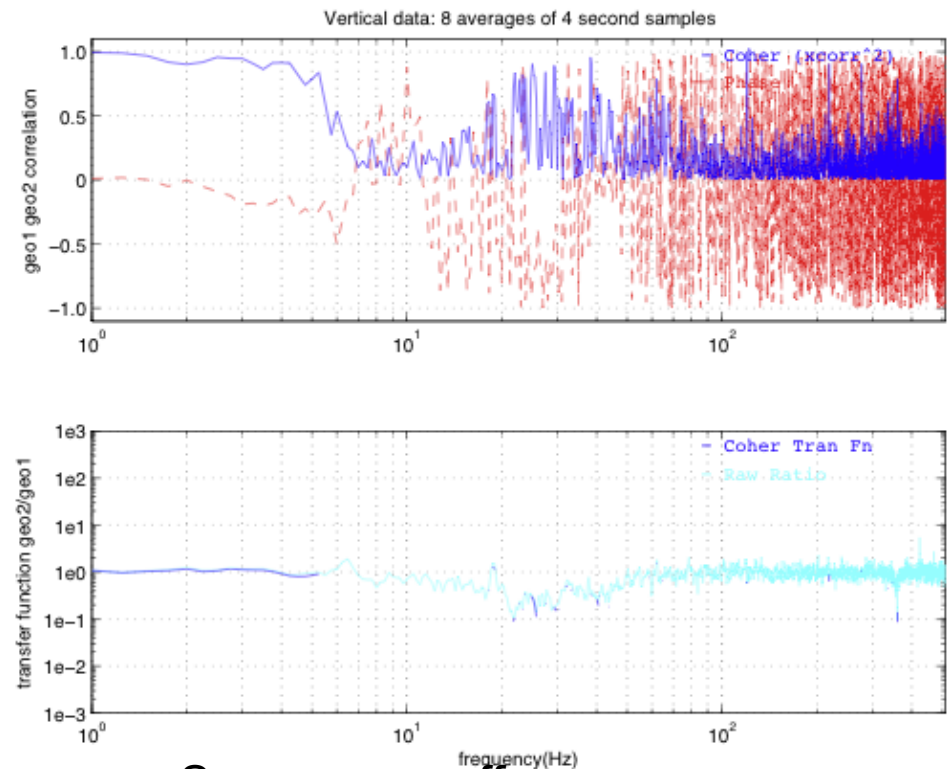
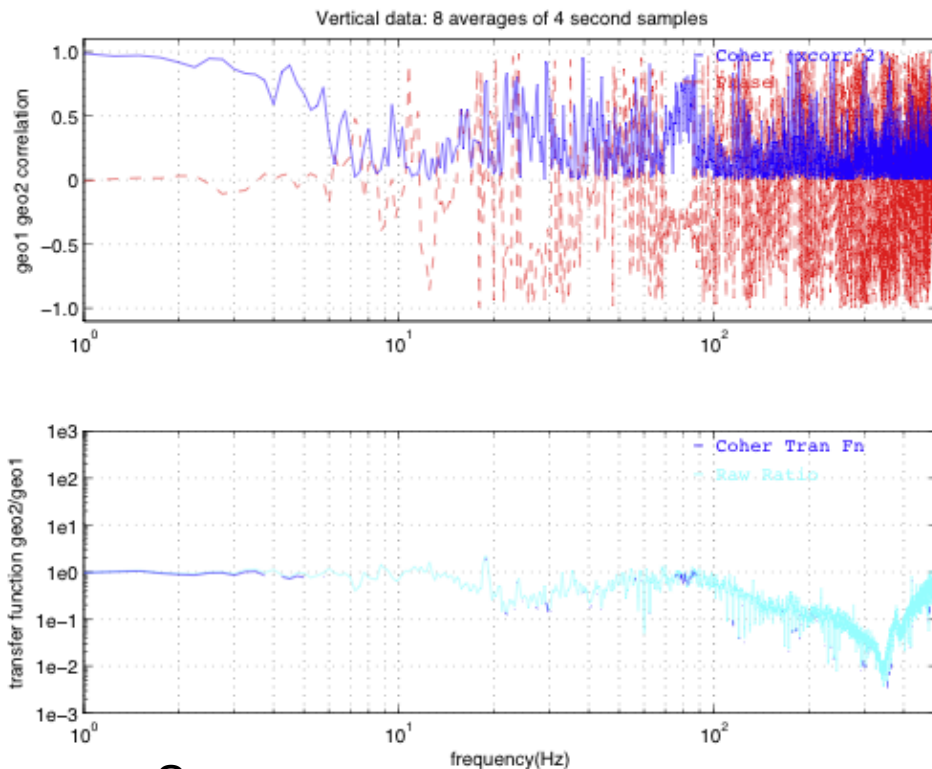


Change # of Averages



- More averages give smoother, more accurate data
- Final focus tunnels, 10-28-2011, ~15:30

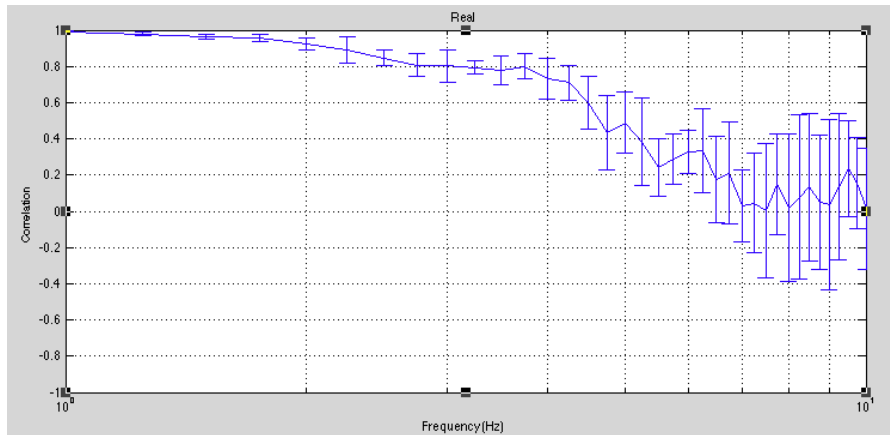
Change Ambient Noise



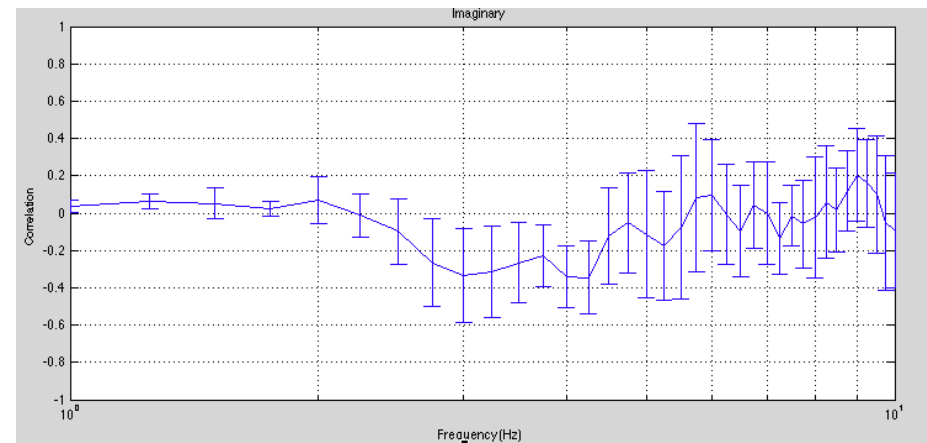
- Sump pump on
- Sump pump off
- Sump pump near N sensor; lots of noise at 60Hz and harmonics, especially 360 Hz
- HF noise may affect measurement slightly
- SLD pit, 10-28-2011, ~15:30

Correlation: Mean and Std Dev

- Real



- Imaginary

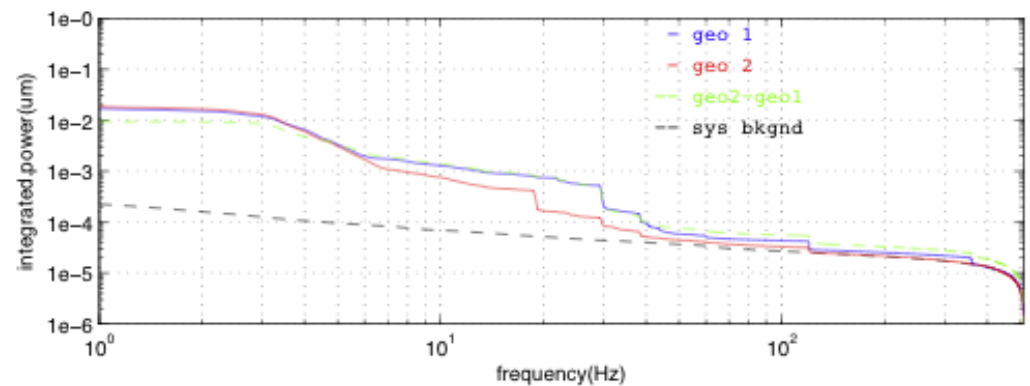
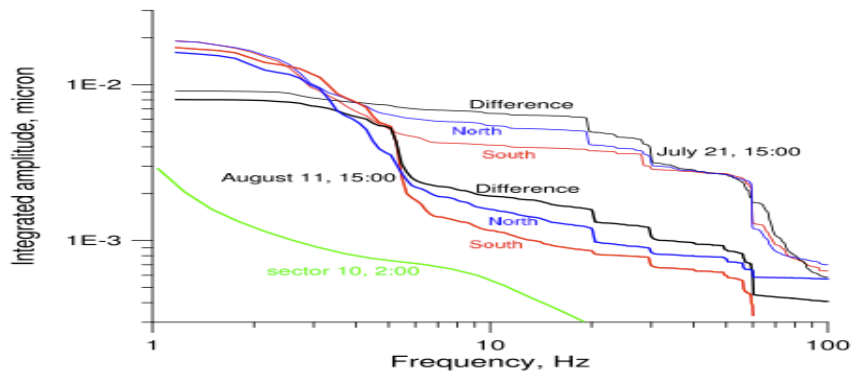
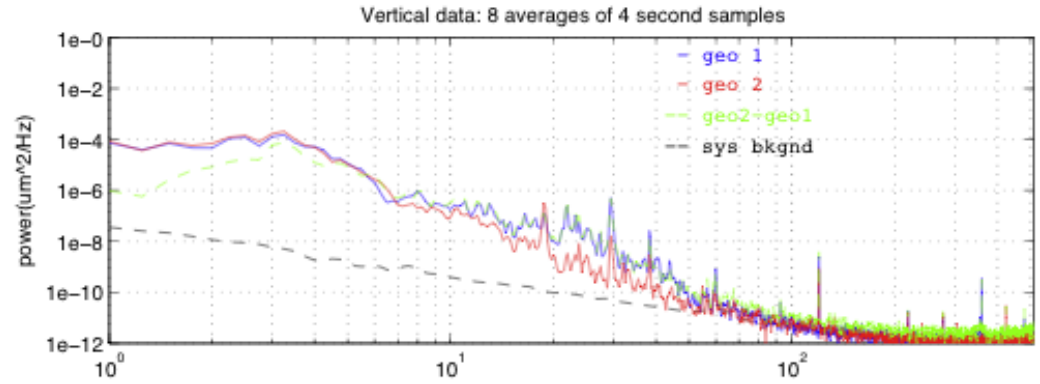
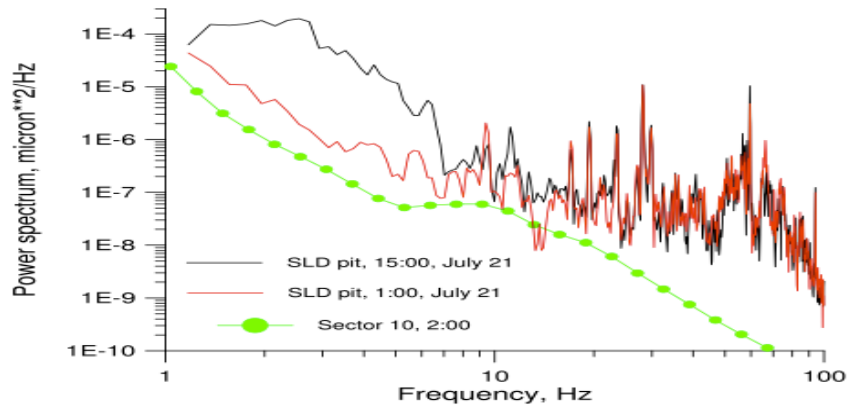


- Statistics based on 7 measurements, each using 8 averages of 4-sec data sets
- Std Dev should drop with $N^{1/2}$, where N is number of averages
- SLD tunnel, 10-28-2011, ~15:30

Conclusions

- SLD Hall Noise Measurements
 - LF almost identical, 11 years later
 - HF slightly quieter now
- Correlation Measurements
 - Need lots of averages (~ 100) for good data
 - Motion seems to be well correlated up to ~ 0.1 - 0.2 wavelength

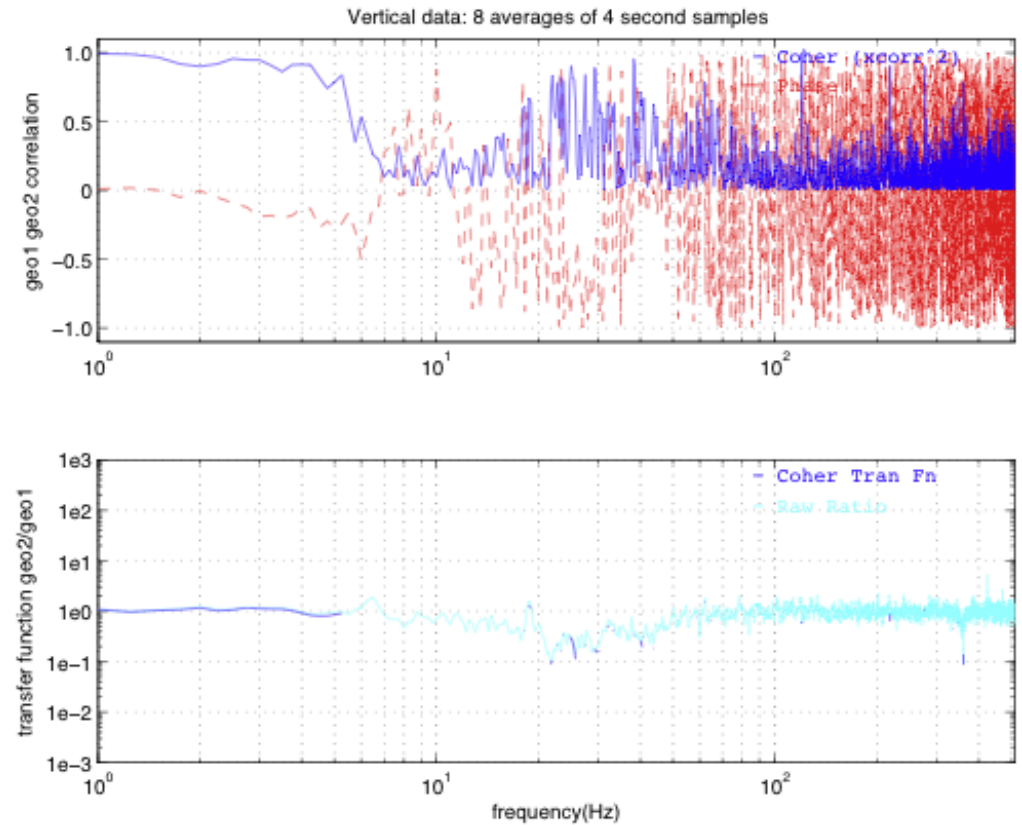
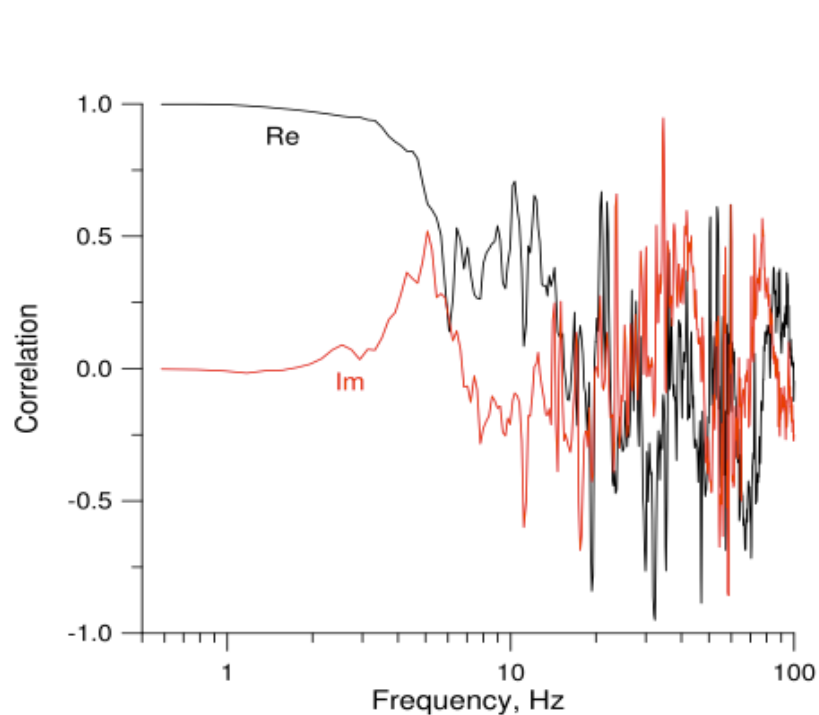
Power Spectra in Pit



- Seryi, Breidenbach, Frisch, SLAC-PUB-8594 (2000)

- #28153650, 10-28-2011, ~15:30
- Geo1--North, Geo2--South

Correlation in Pit



- Seryi, Breidenbach, Frisch, SLAC-PUB-8594 (2000)

- #28153650, 10-28-2011, ~15:30