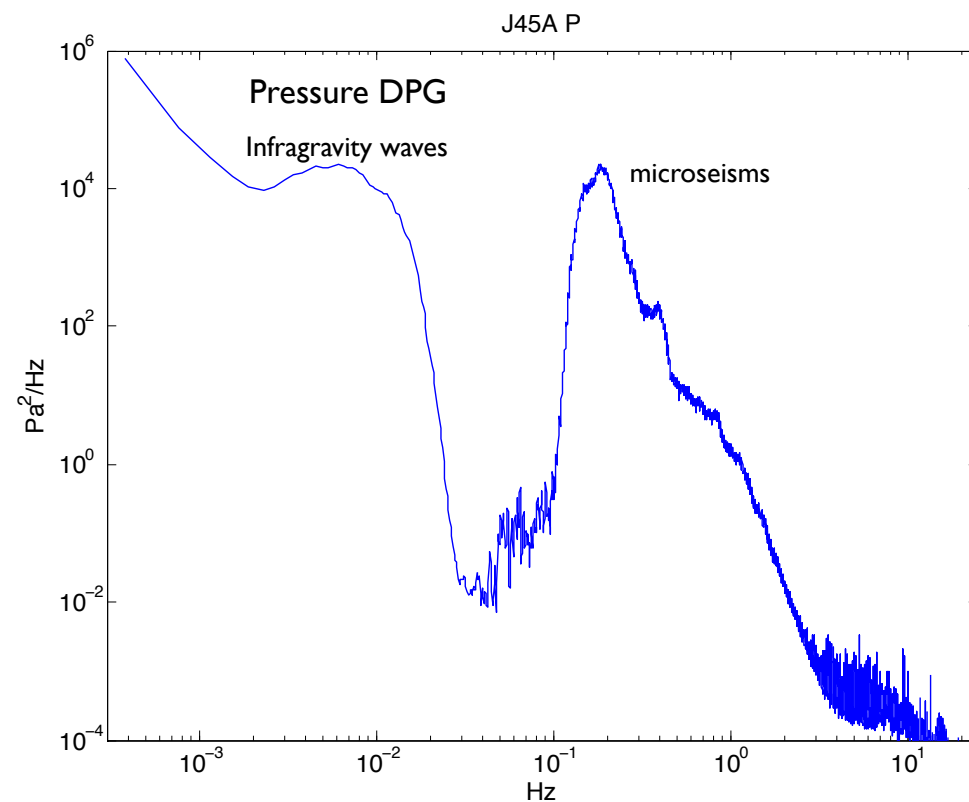
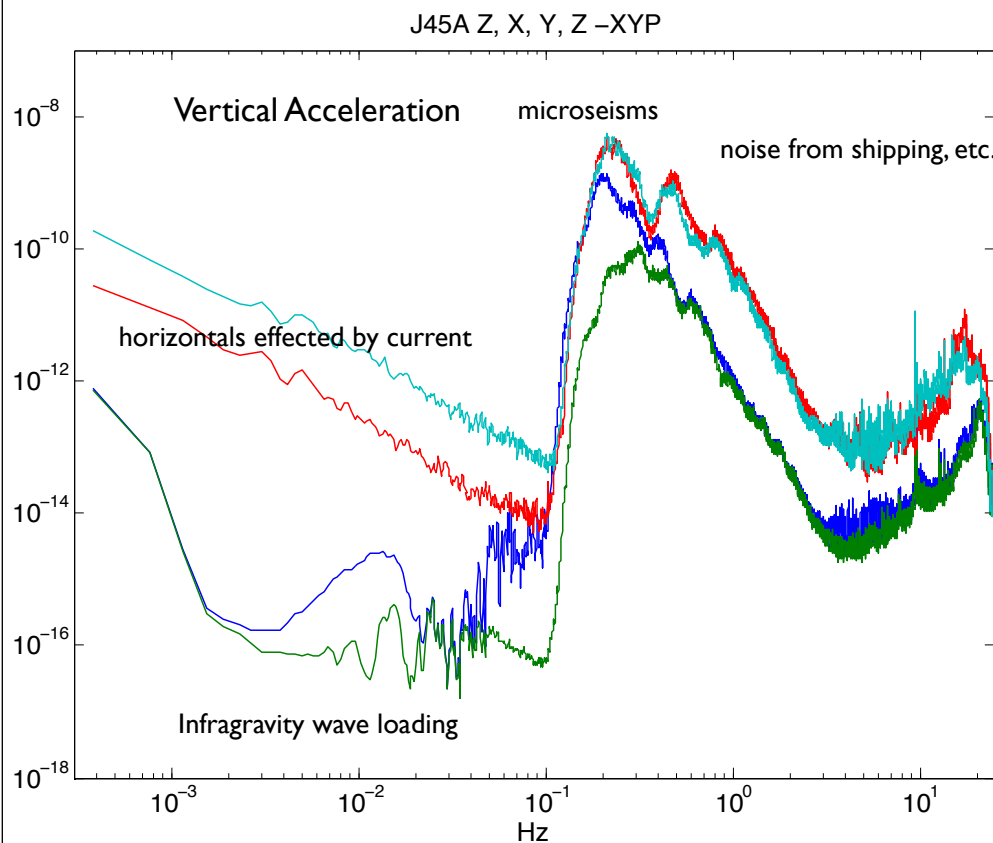


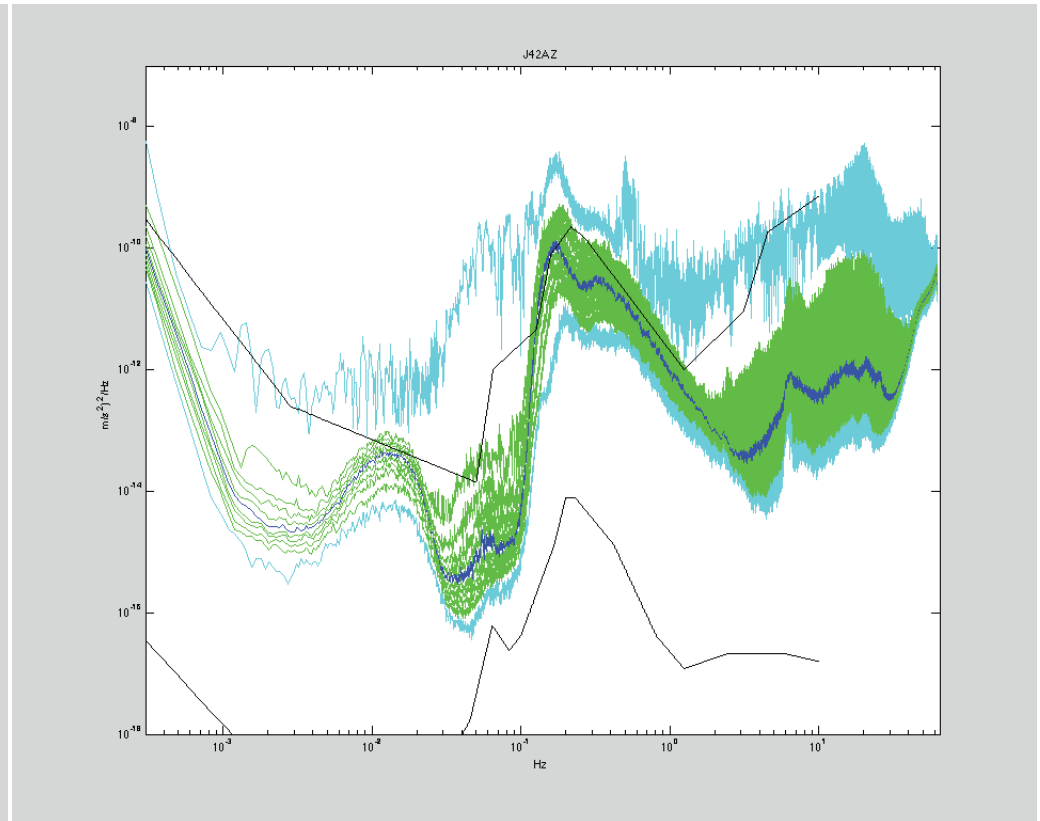
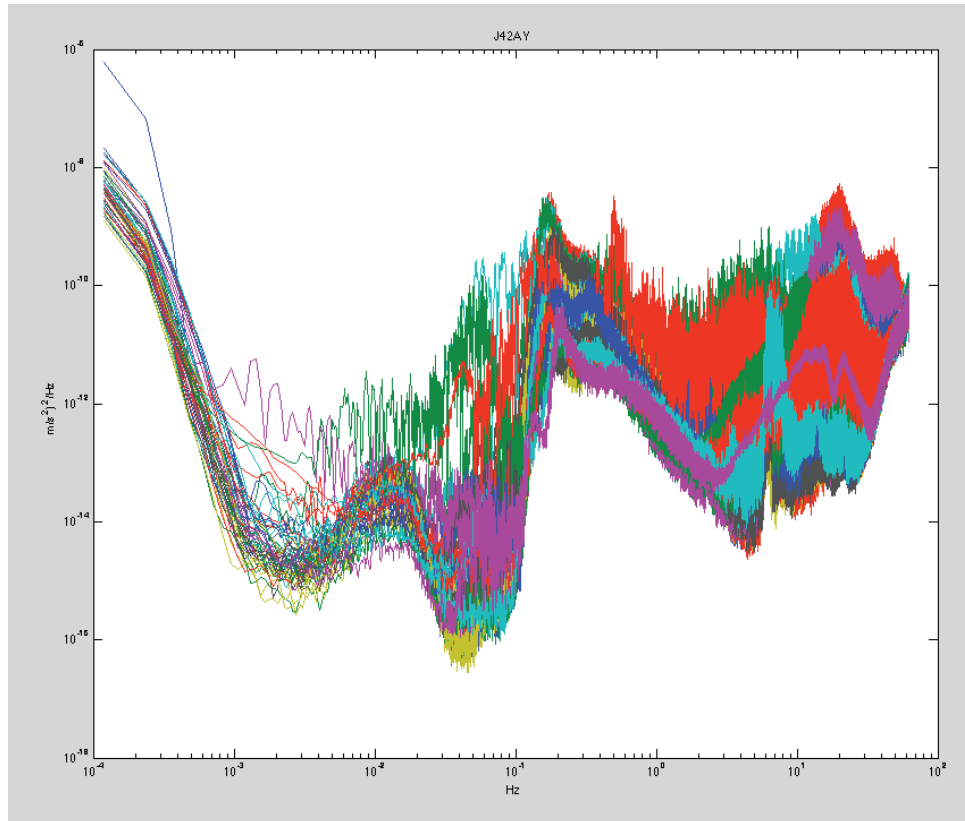
Cascadia OBS Noise

Deep Water- Vertical and pressure from J45A 2747m



Run spectra on 4 day long sections of data from entire data set. (may include some data during OBS recovery). Some spectra shown have more d.o.f, and lower resolution by a factor of 8 than others (shows up in the min freq. and std dev. of spectra).

Sort and bin spectral data and determine 0, 10, 20%.. 100% spectral values. Dark blue is the median value. 0 and 100% values (max and min) are cyan.



Wave Pressure Noise and Wave Loading

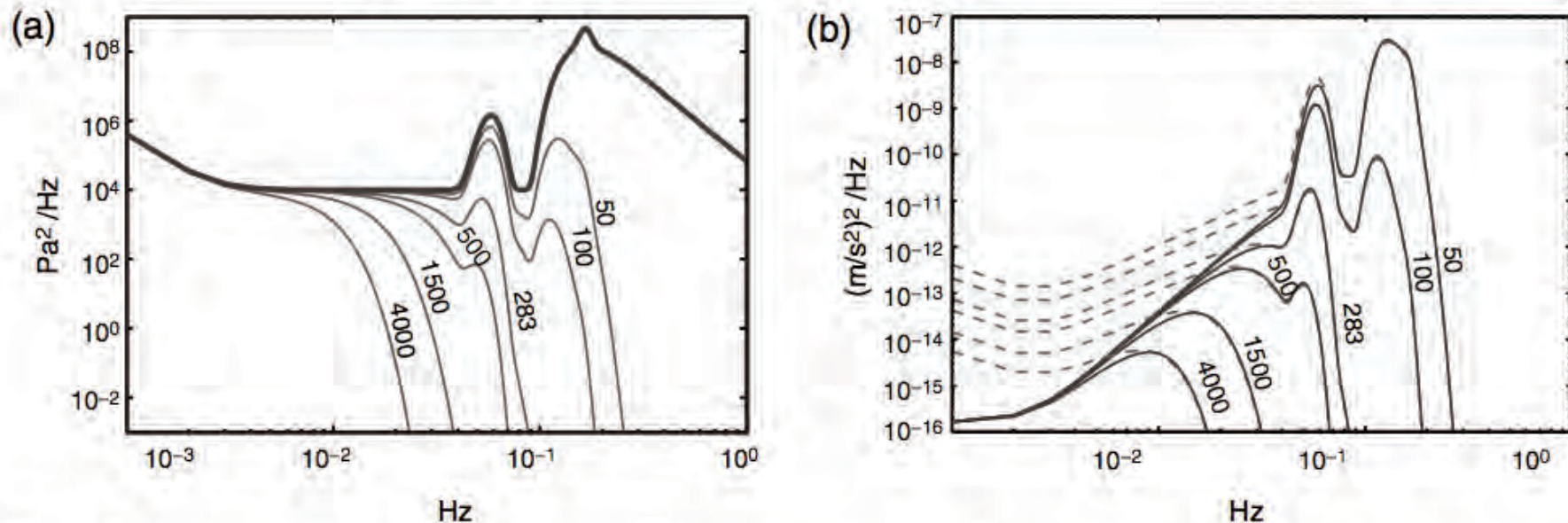
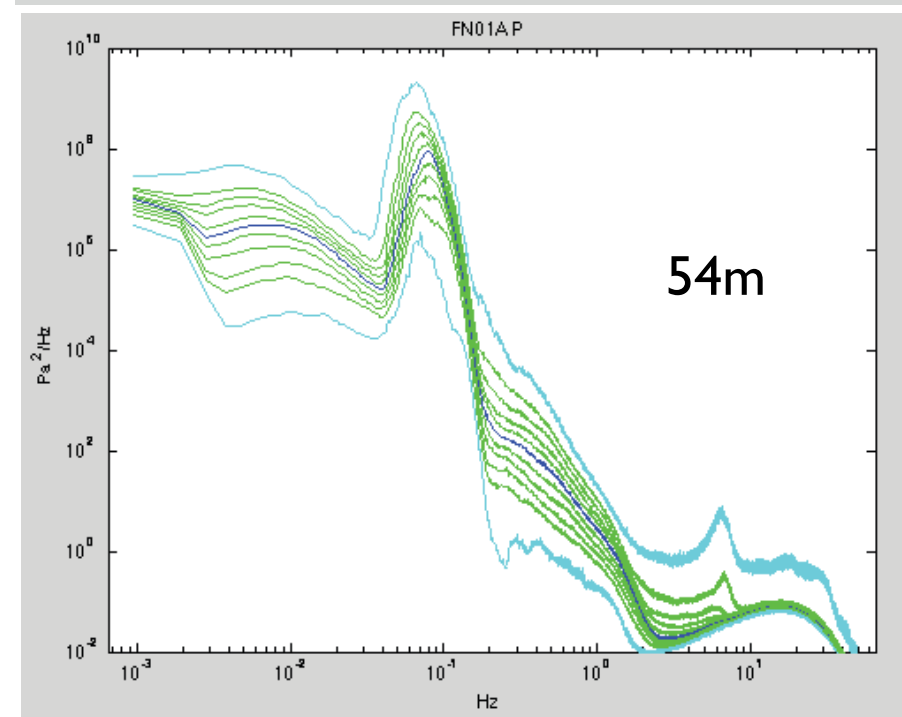
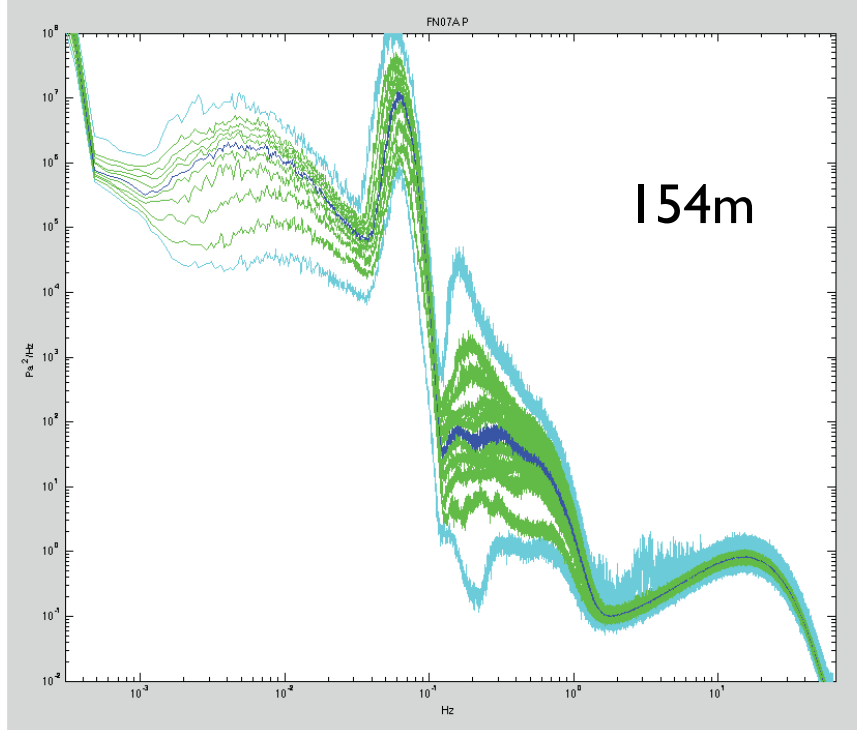
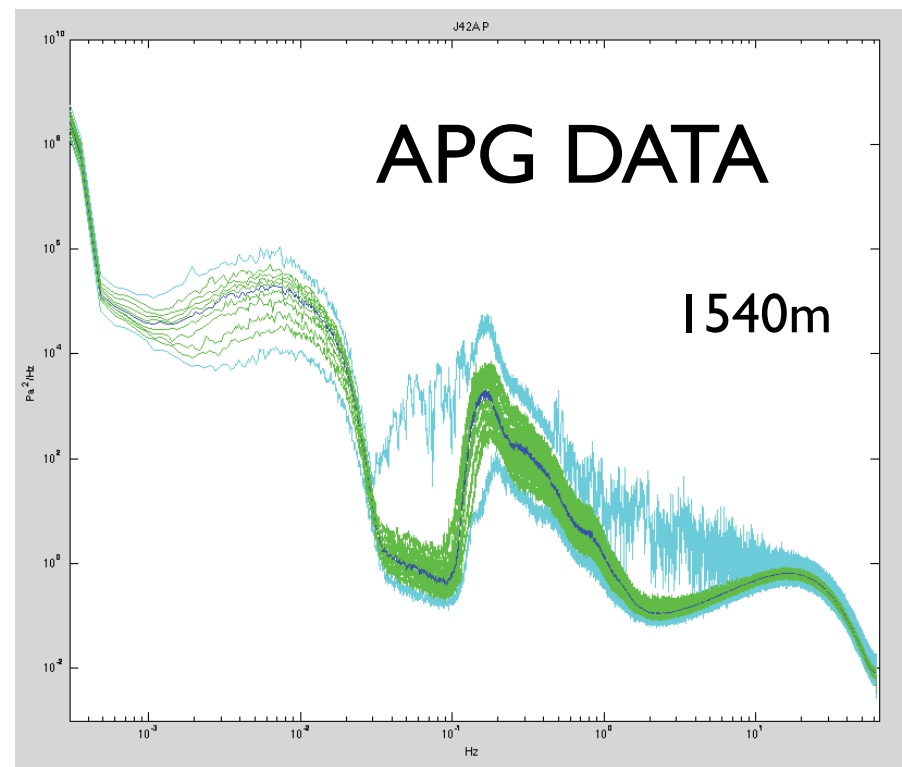
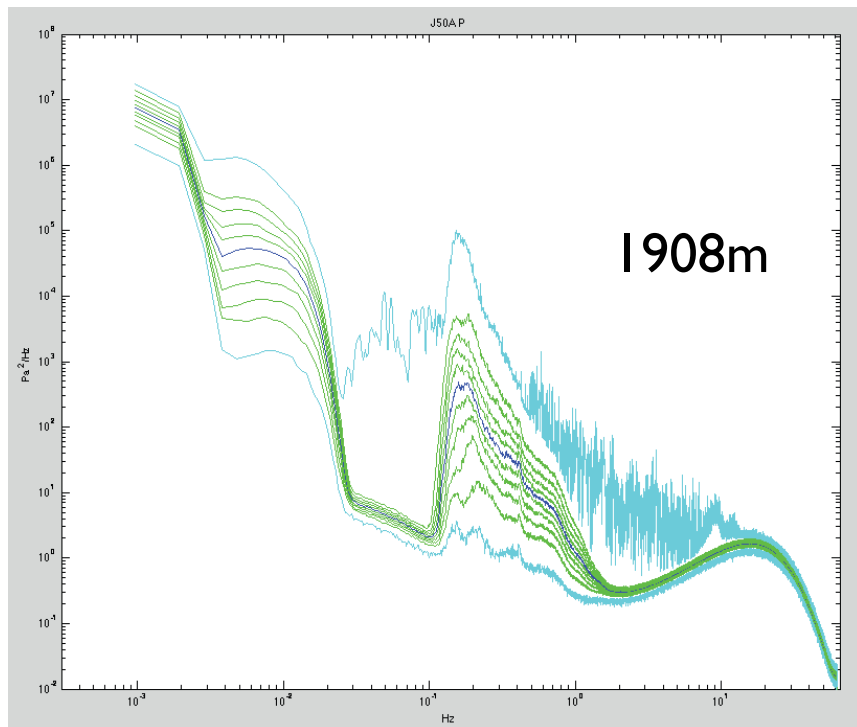
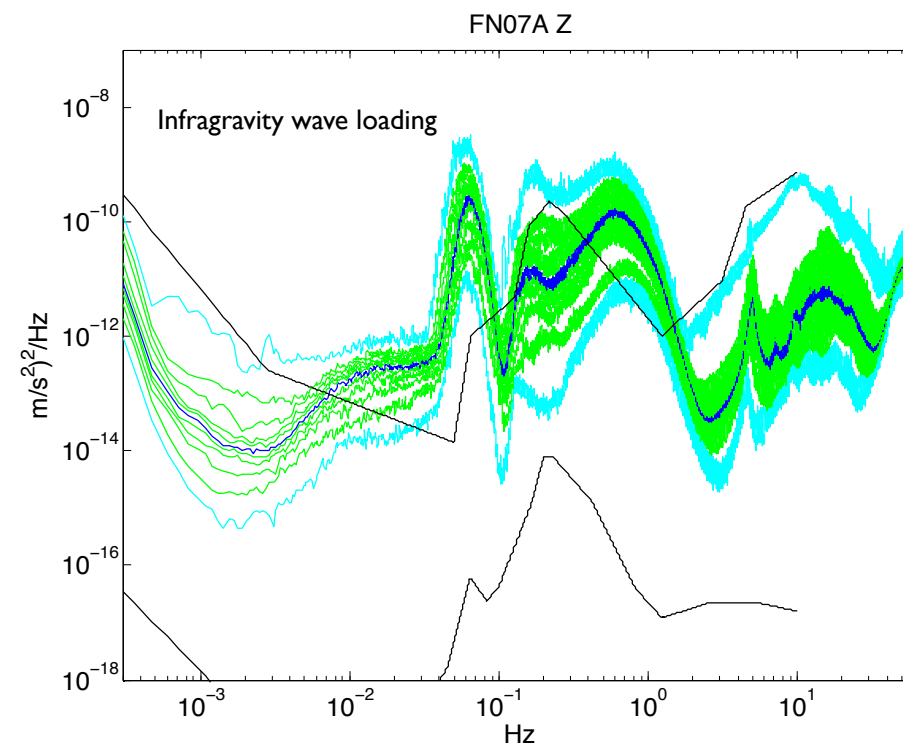
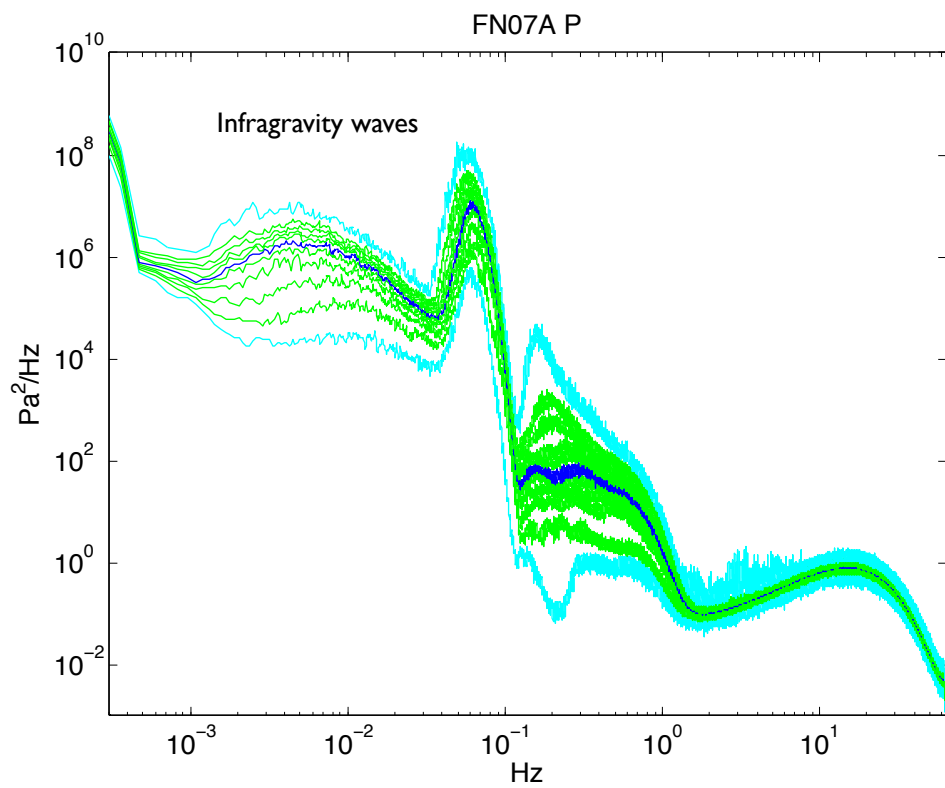


Figure 4. (a) A model for the pressure spectrum at the sea surface including the long-period (infragravity) waves, a small peak corresponding to a 16 sec swell, and an energetic wind-driven wave spectrum at higher frequencies (heavy line). Gray curves show the predicted pressure spectrum at the seafloor in different water depths. (b) Models for the vertical (solid lines) and horizontal (dashed) acceleration spectra expected at the seafloor due to deformation under wave loading in this wave model for different water depths.

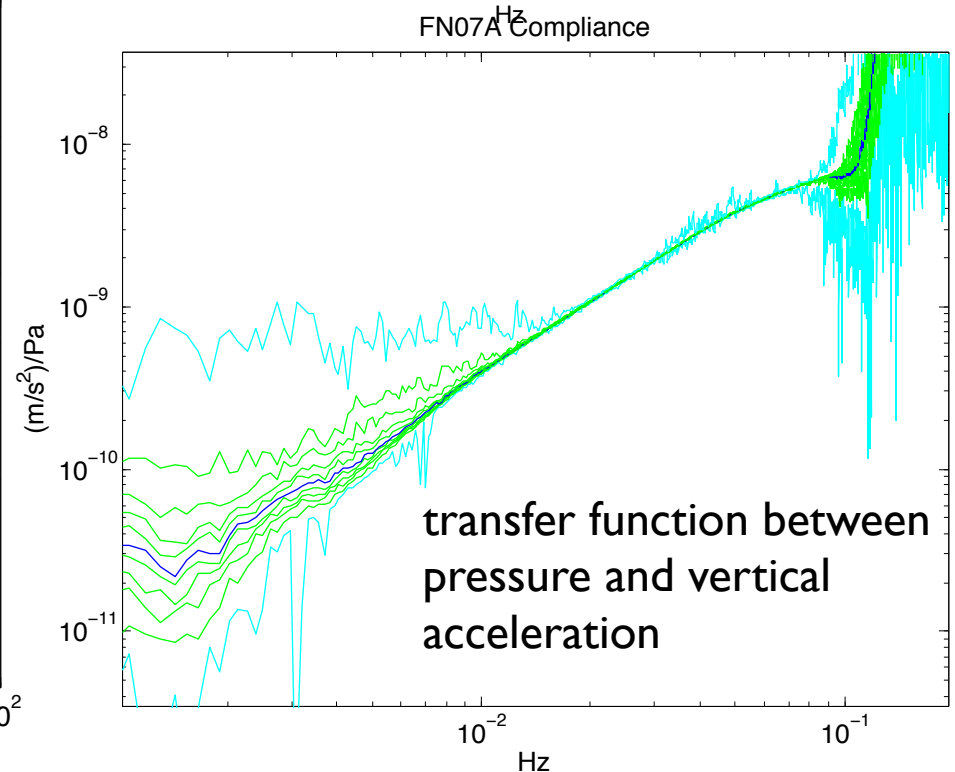
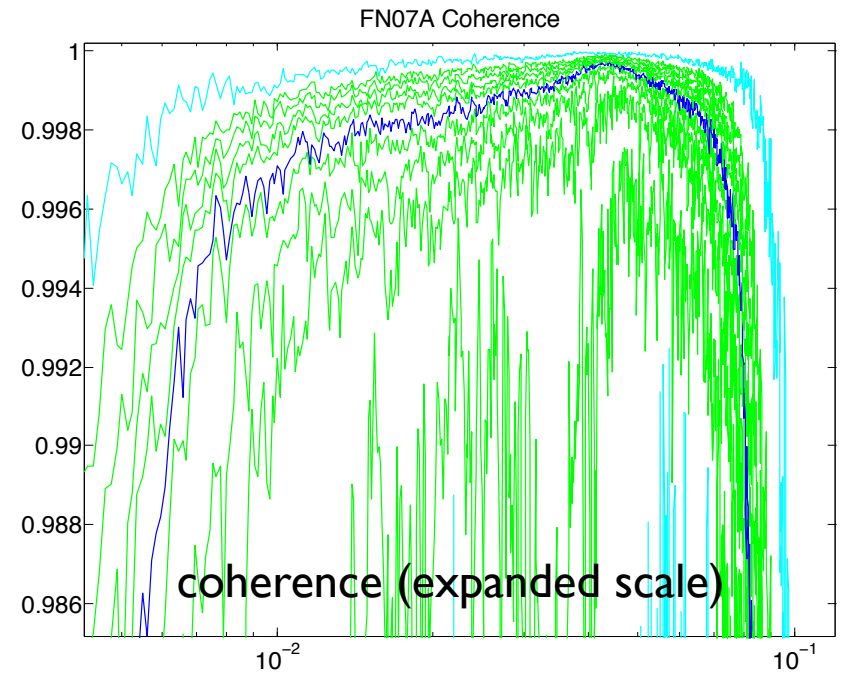
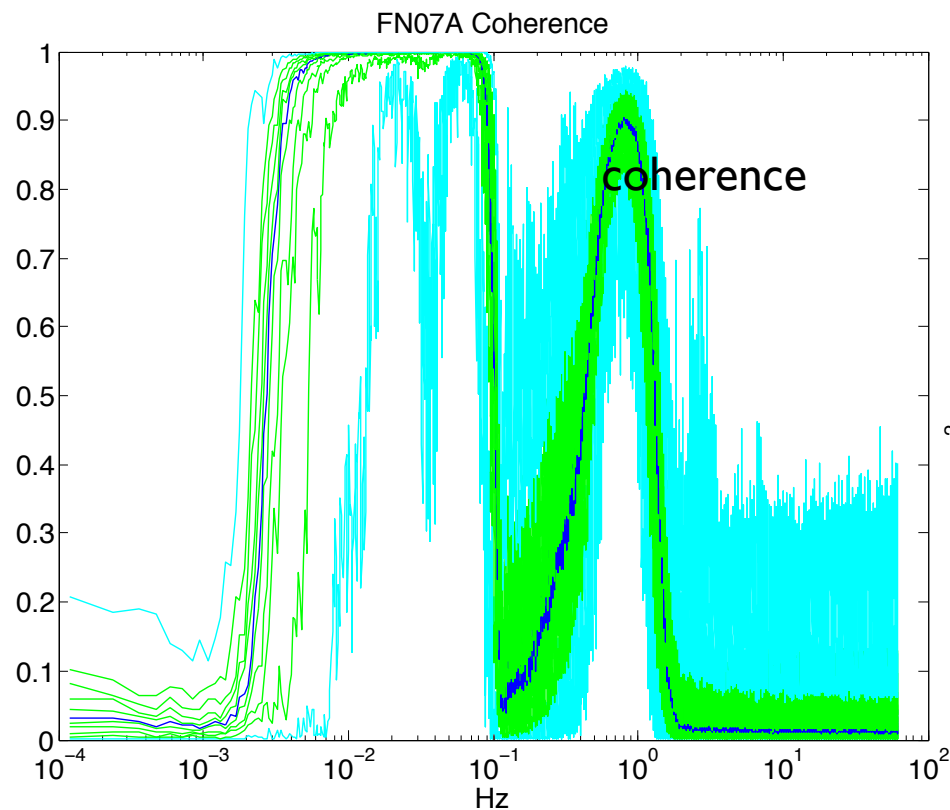
Webb and Crawford, BSSA, 2010



Pressure Vertical Acceleration from FN07 154m

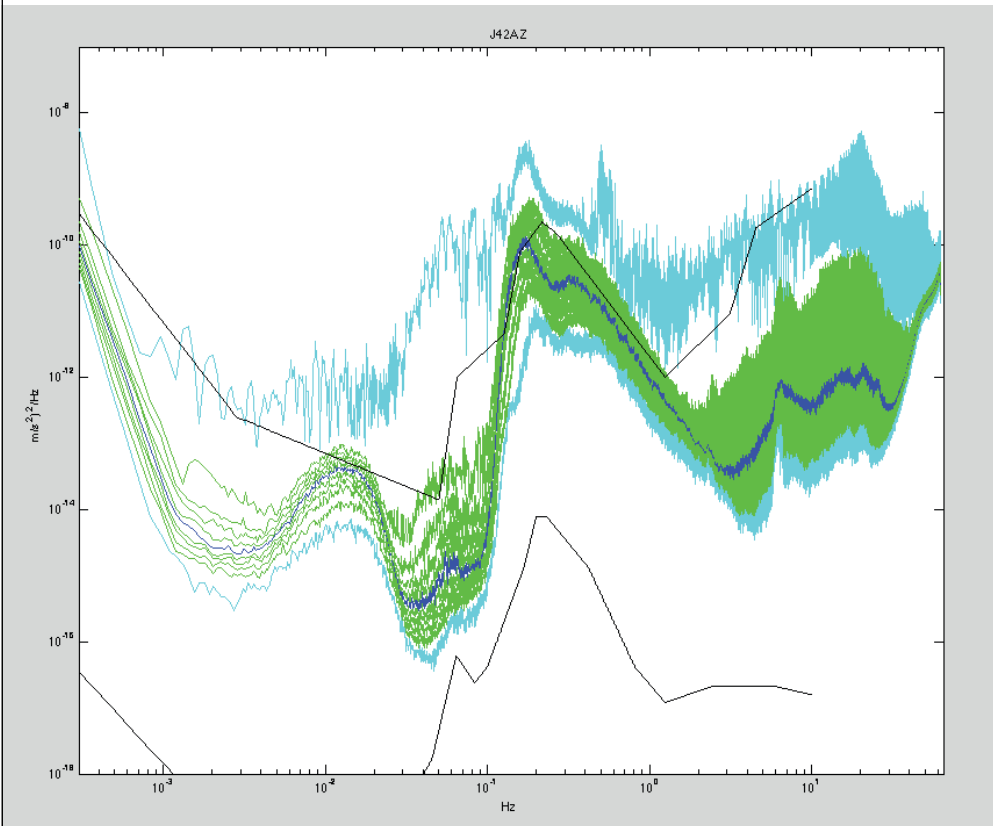


The coherence between vertical acceleration and pressure is very high in the infragravity wave band, allowing very accurate calculation of the vertical deformation from wave loading from the pressure record and removal from the vertical component record.

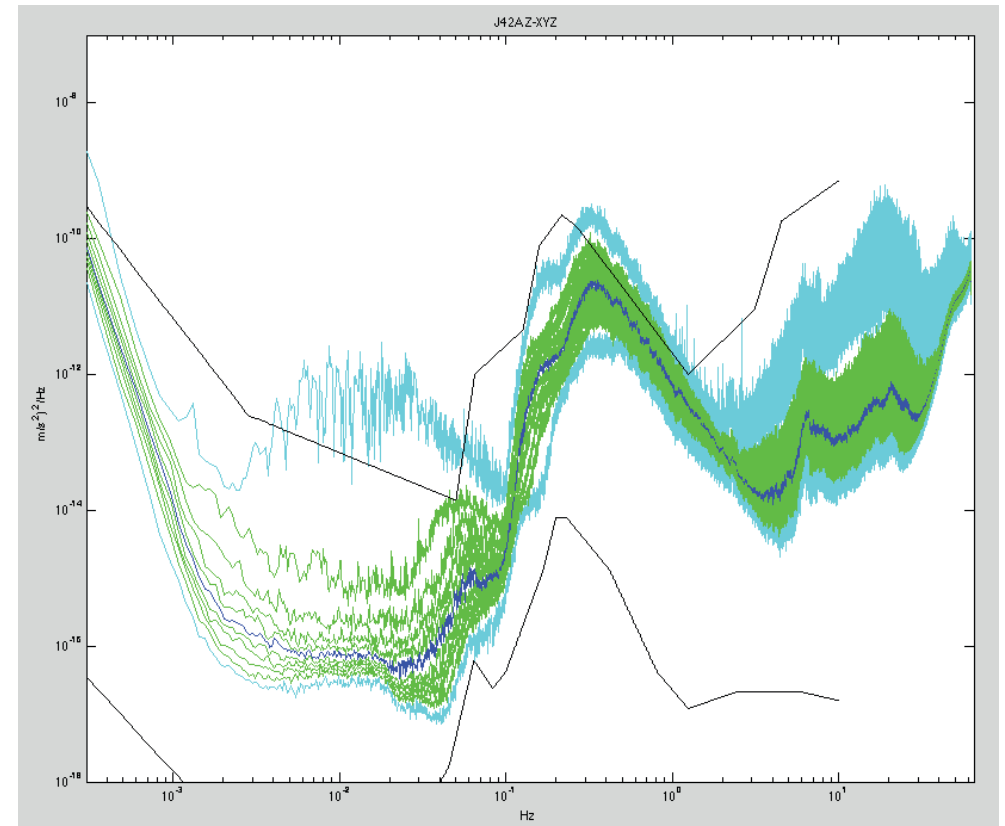


Vertical Acceleration from J42A 1540m

Vertical original

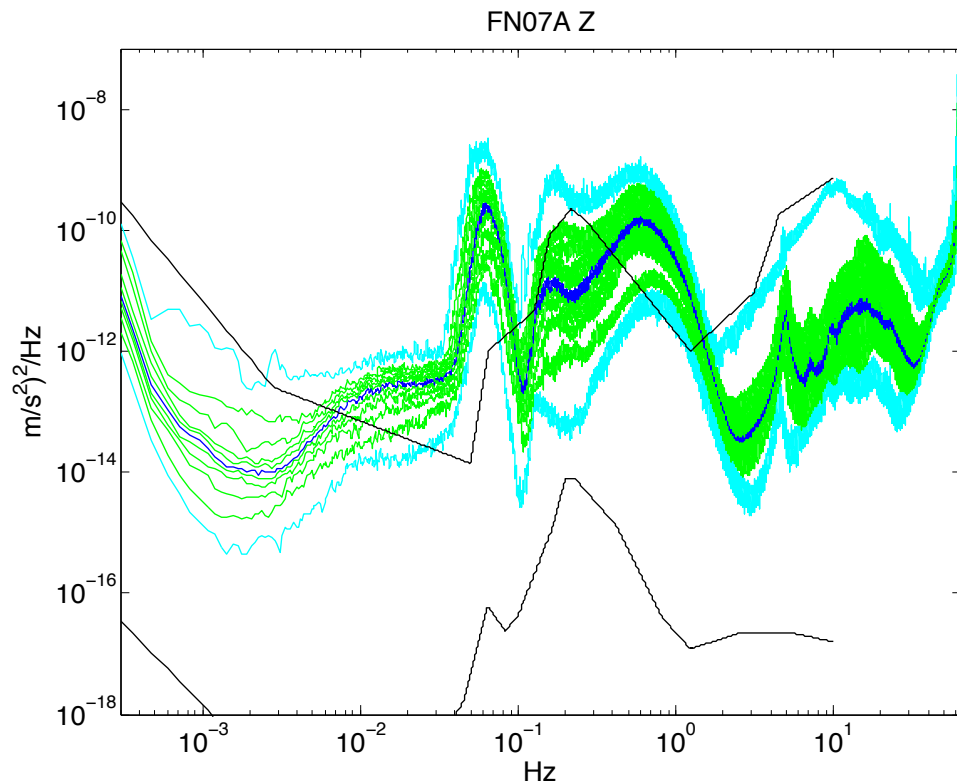


Vertical after using pressure signal and compliance function to remove wave loading noise

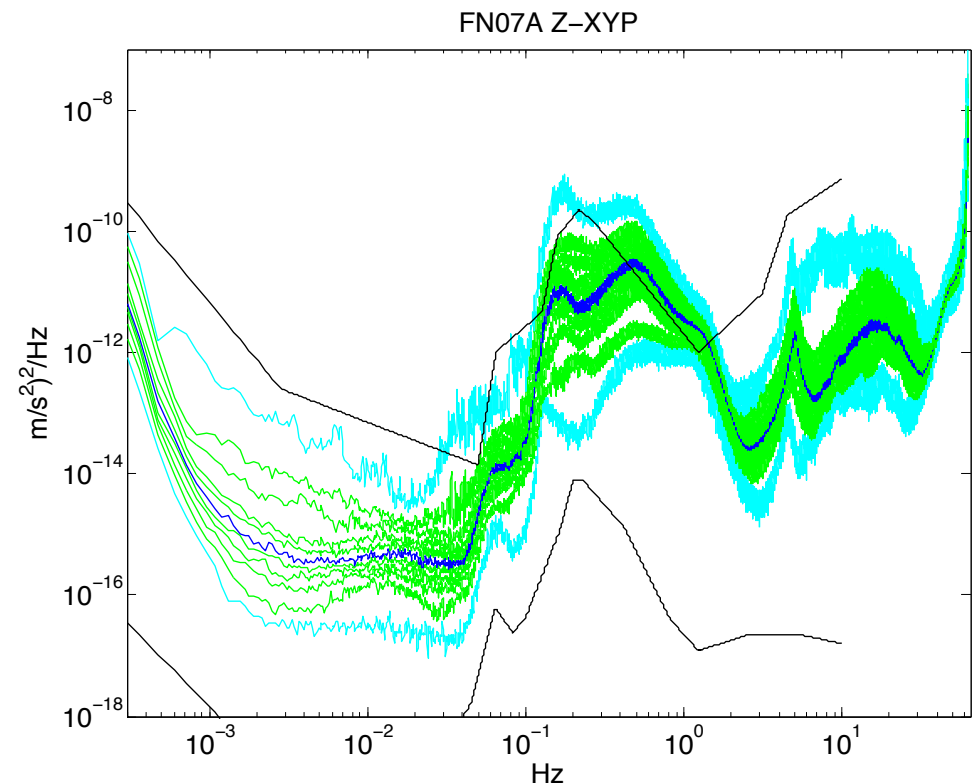


Vertical Acceleration from FN07A 154m

Vertical original



Vertical after using pressure signal and compliance function to remove wave loading noise



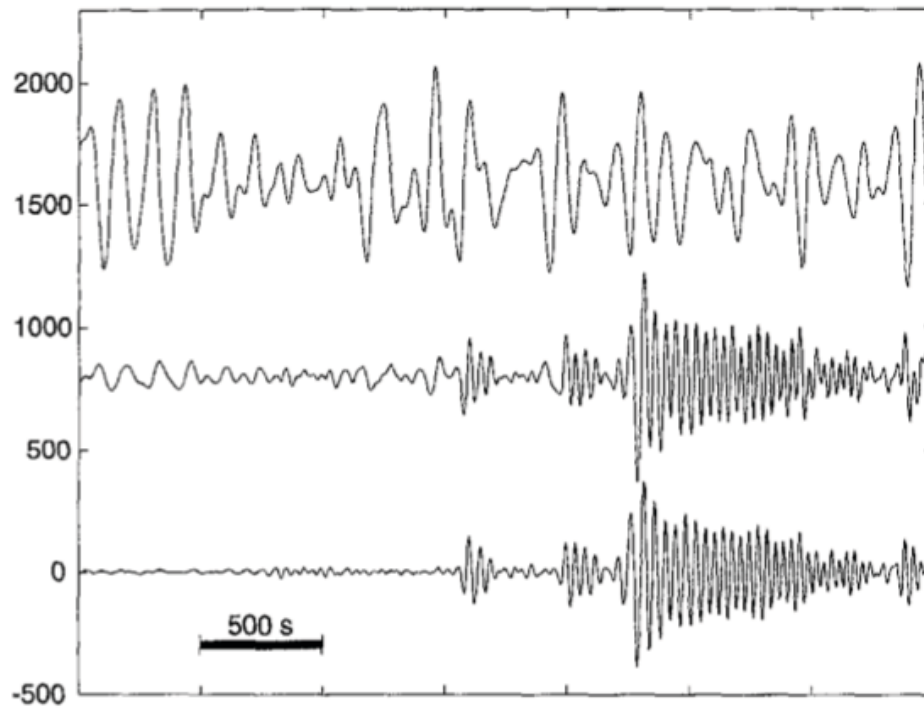


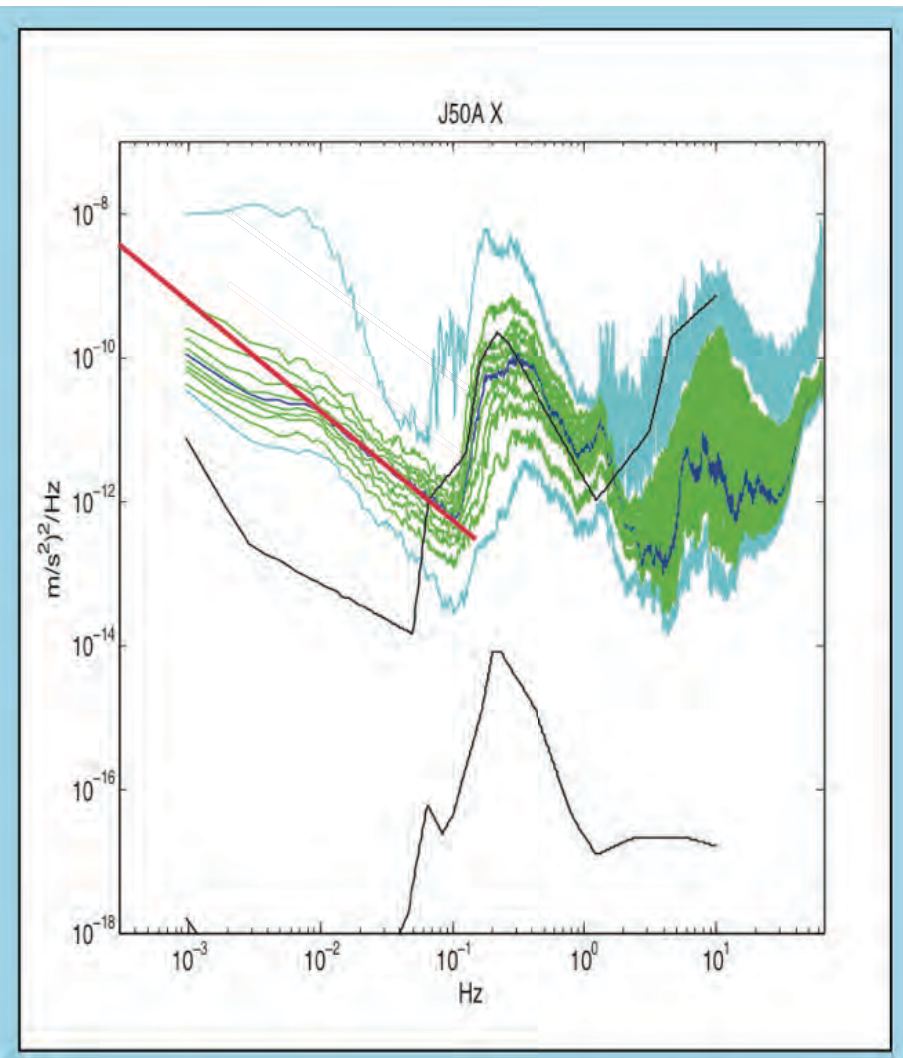
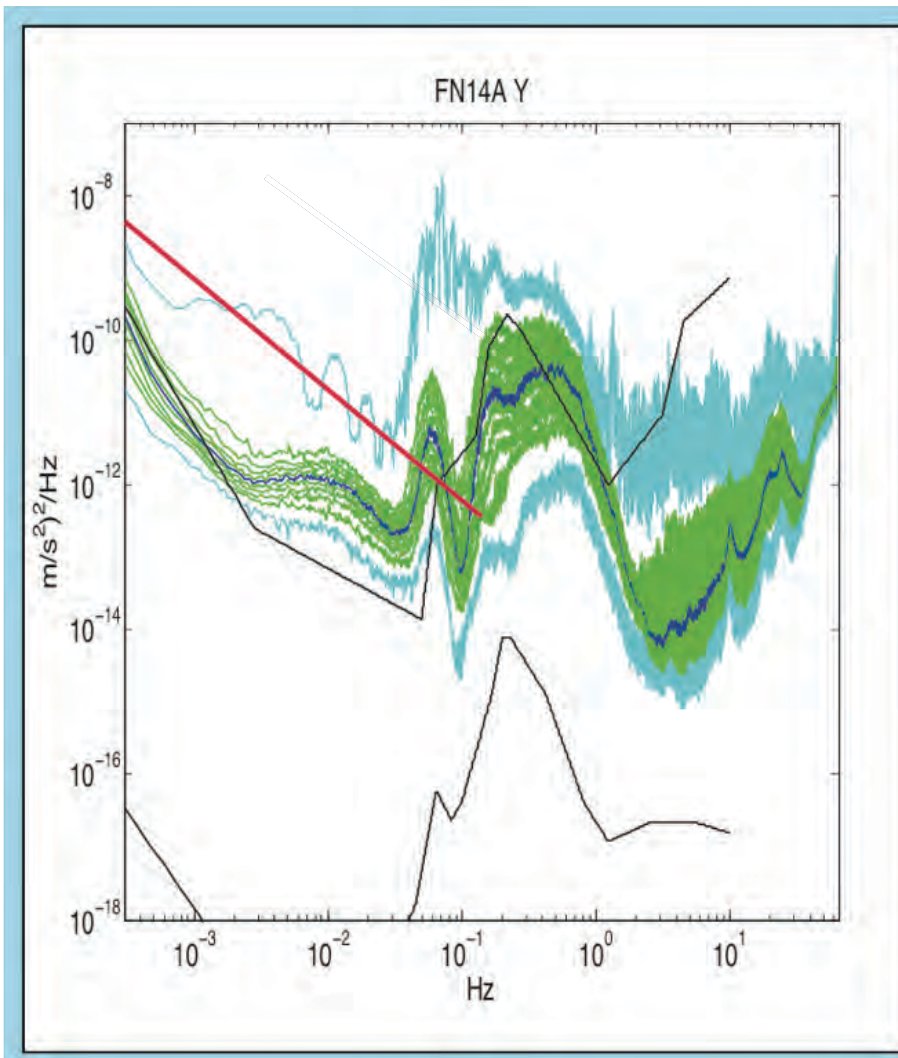
Figure 1. Top trace, differential pressure record filtered in the band from 0.008 to 0.04 Hz from a M_S 6.0 event in the Aleutian Islands observed at a site offshore of San Diego in 750 m of water. The infragravity waves completely obscure the event in the pressure record. Middle trace, filtered record of vertical acceleration from the same event. The deformation signal from infragravity waves is apparent before the body-wave arrivals. Bottom trace, the result of predicting the deformation signal from the pressure record and subtracting it from the acceleration record. The SNR for long-period phases has been improved by nearly 25 dB.

Removal of infragravity wave loading signal from vertical acceleration record. (Webb and Crawford, BSSA, 1999).

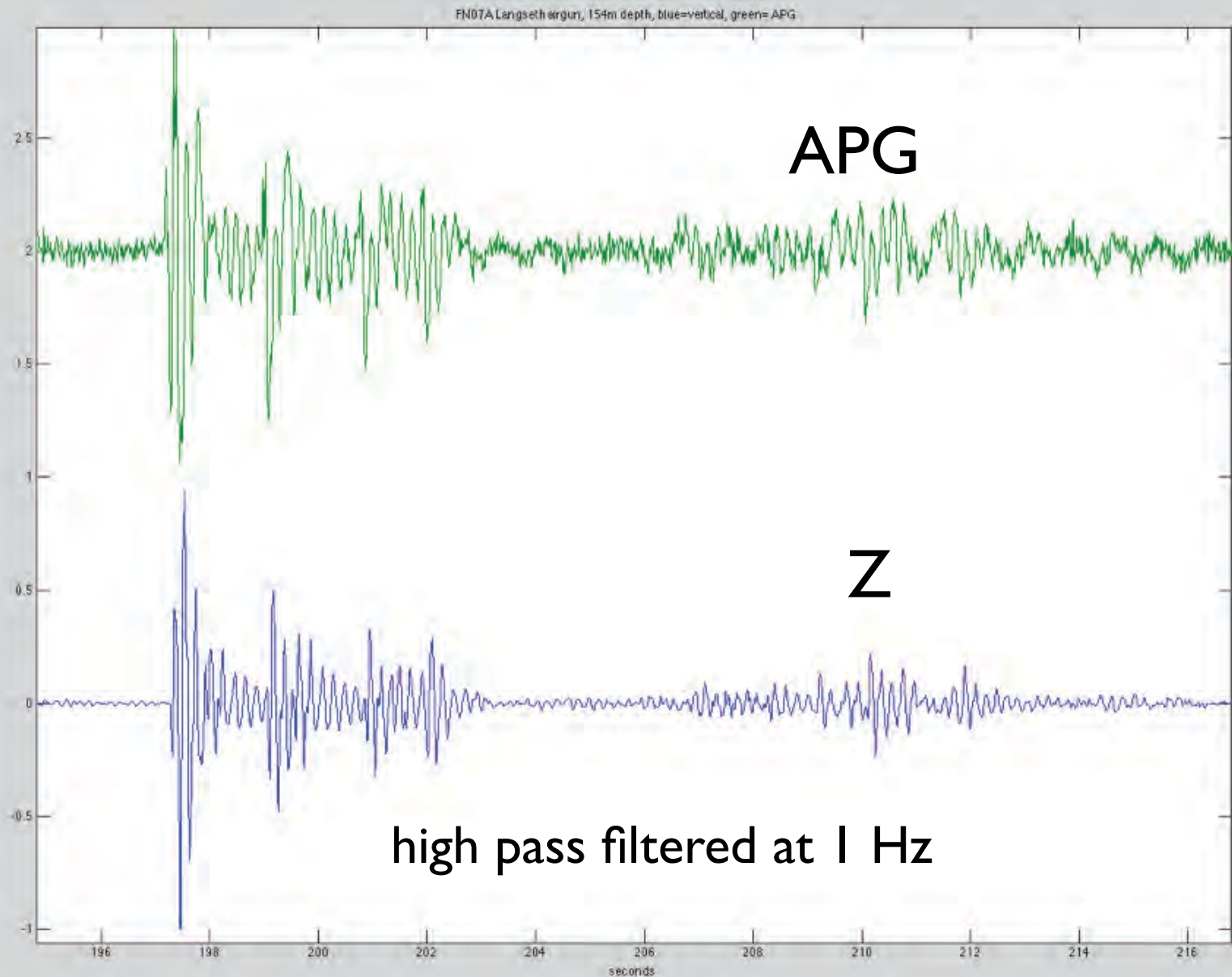
Trawl Shields- Shielding of Horizontals from Current

FN14 173m, trawl
shielded LDEO OBS

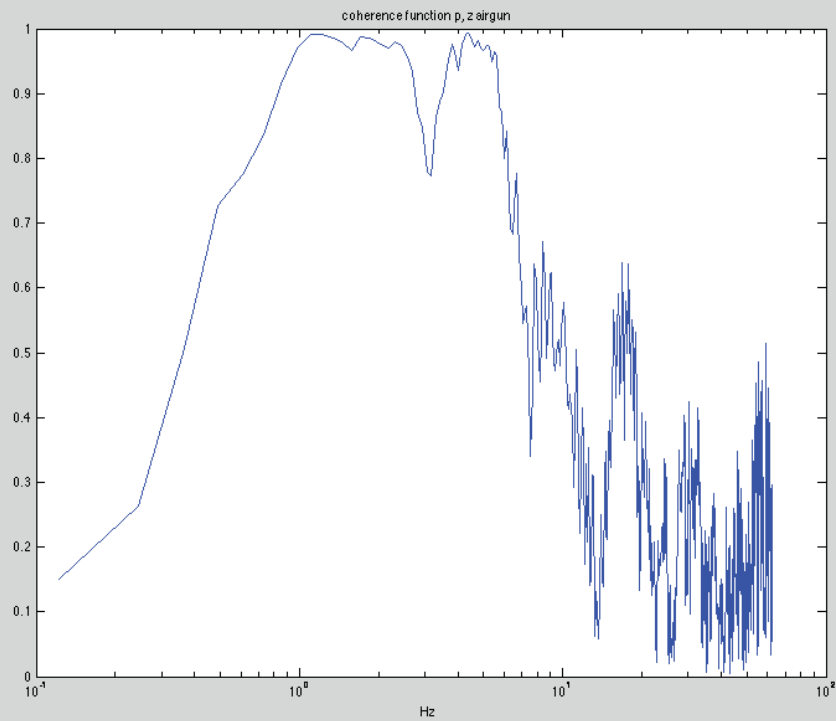
J50 1908m, unshielded
standard LDEO OBS



Langseth Airgun from site FN07A, 154m depth



Coherence between $\text{diff}(Z)$ and $\text{diff}(\text{pressure})$ from short airgun record



Spectra of $\text{diff}(Z)$ and $\text{diff}(P)$ from short airgun record and background spectrum

