Wavelet Energy Absorption

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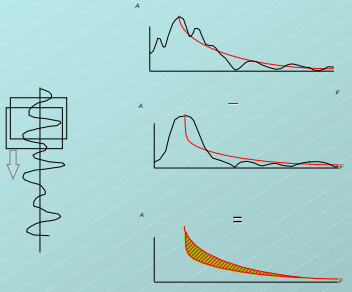
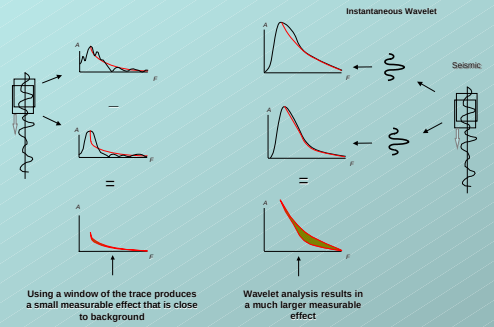
From the convolution theorem:
T(t) = W(t) * R(t) + N(t)
However:
R(t) is the reflection coefficient and contains no information about attenuation
W(t) is the wavelet and reflects the effect of frequency dependent attenuation among other things.

Absorption works by measuring a drop in the high frequencies due to gas

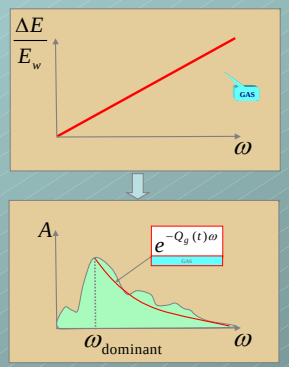


But if calculated directly from the trace, reflection coefficients are noise for absorption

Instantaneous Wavelet Approach to Absorption Analysis

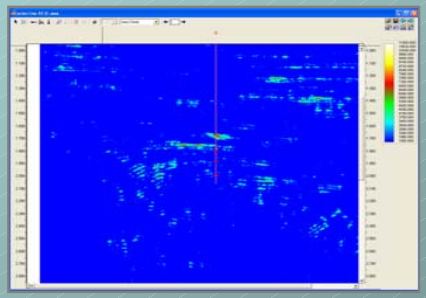


Analyzing Attenuation Due to Gas

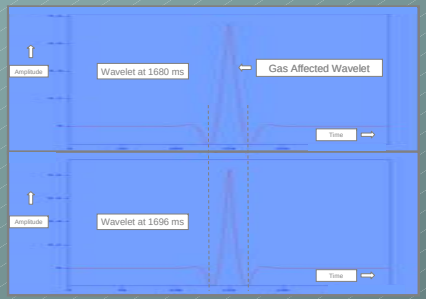


1. So we extract the instantaneous wavelet from a sliding window along the trace.
2. For gas we analyze from dominant to nyquist frequency.
3. Remove the background attenuation from the gas [illegible] attenuation function.

Example from a known gas reservoir



Wavelets extract from the trace



The wavelets are separated by 16 ms in time. However, the shallower wavelet is effected by the gas and exhibits a lower frequency.