Modeling the broad band radiation of the seismic source

AND ITS SLIPPERINESS

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What is a modeling ?

REALITY

What is a modeling ?

A SCHEMATIZATION OF THE REALITY

What is a modeling ?

WHAT WE THINK THE
SCHEMATIZATION OF THE REALITY IS

What we think it is …

Frequency domain

- w2 shape
- Corner frequency
- Anelastic attenuation
- Fmax
- Site effect resonance

Time domain

- Wiggling signal
- Non stationary
- Duration
- Amplitude

Which is due to which ?

Using a k2 slip model

Frequency domain

- w2 shape
- Corner frequency
- Anelastic attenuation
- Fmax
- Site effect resonance

Time domain

- Wiggling signal
- Non stationary
- Duration
- Amplitude

Using a k2 model and a complex medium

Frequency domain

- w2 shape
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Time domain

- Wiggling signal
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The bad news …

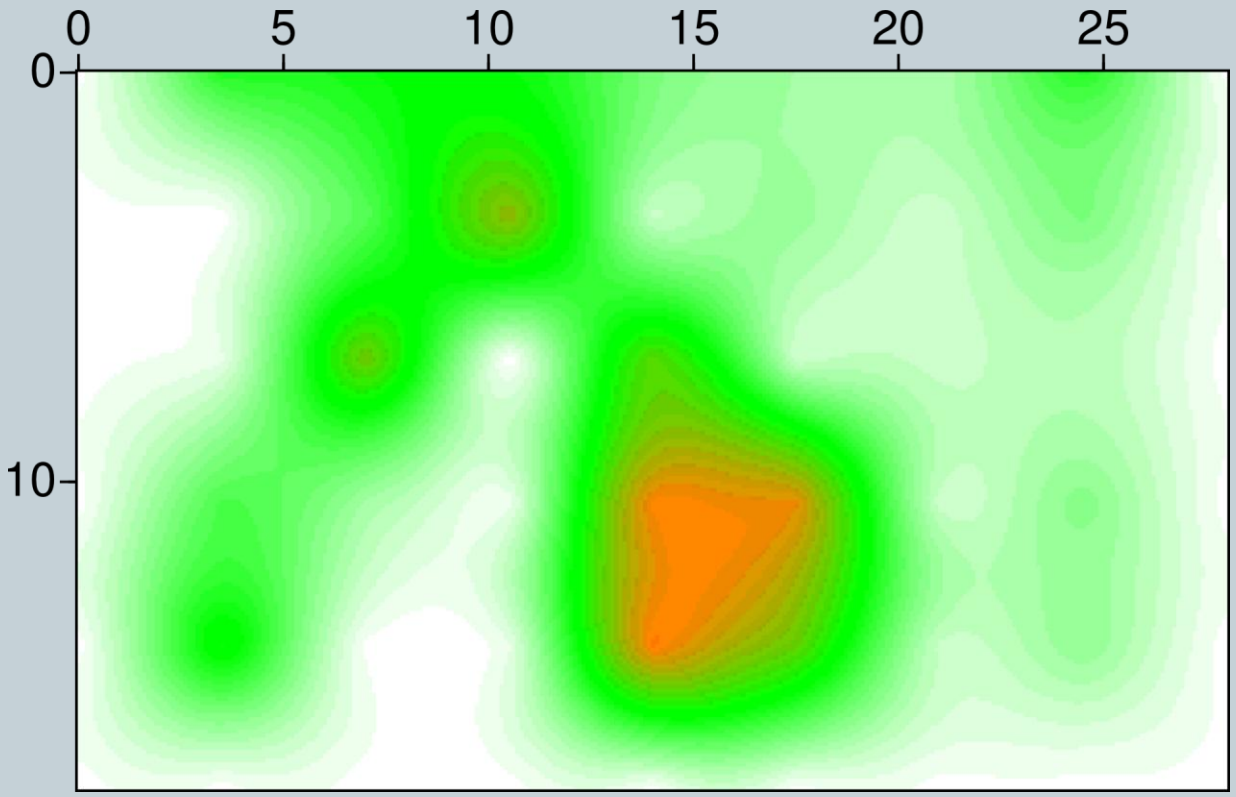
- This solution costs too much for a broad band modeling
- The deterministic LF + stochastic HF trick is not valid theoritically in near source range, i.e. our domain of interest.
- The w2 is not a good model. It fails on directivity.
- Thus the k2 distribution, which models a w2, is not a good model too.

Our goal for this year

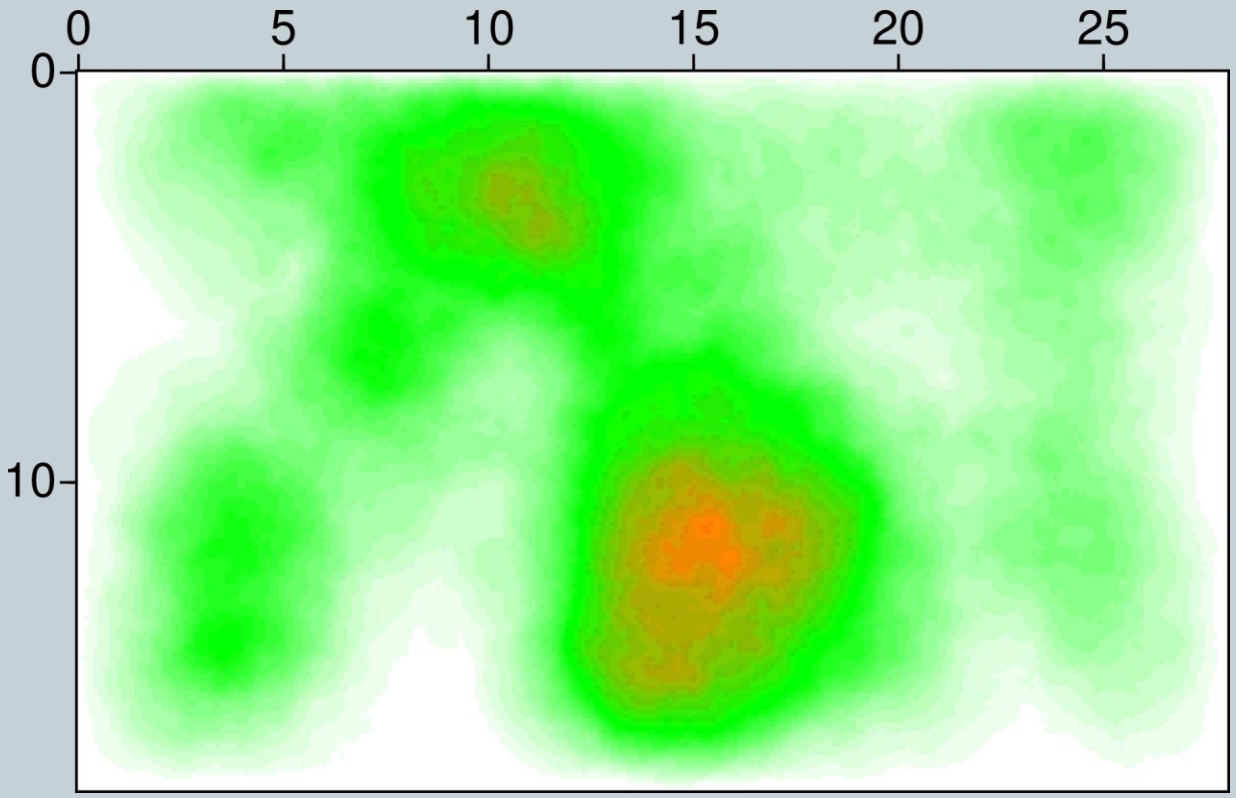
Focus on the k2 advantages and interface it with SPEED for near source simulations :

- Random scenarii selection
- Insert k2 small wave lengths to known slip distributions of real events
- Propose a road to overcome the bad news

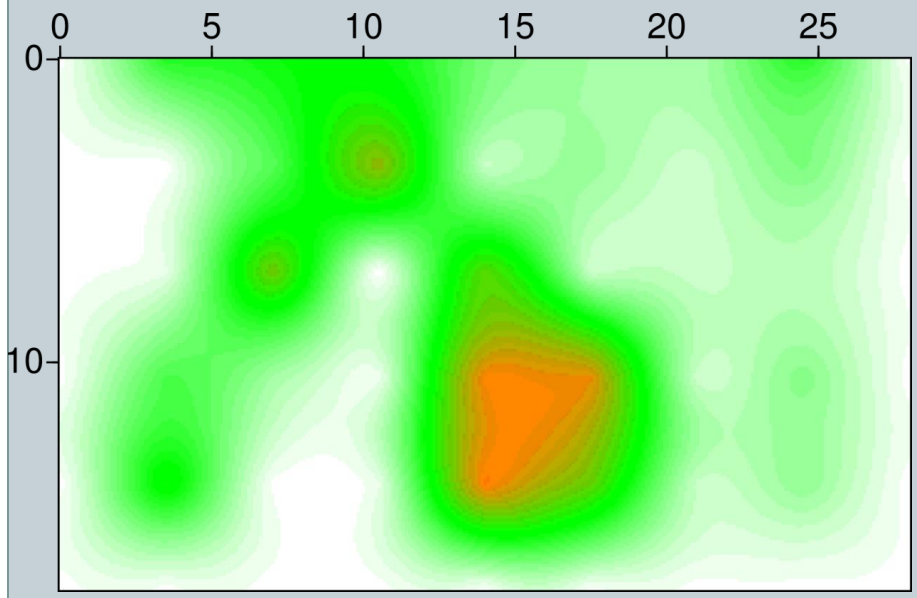
L’Aquila example

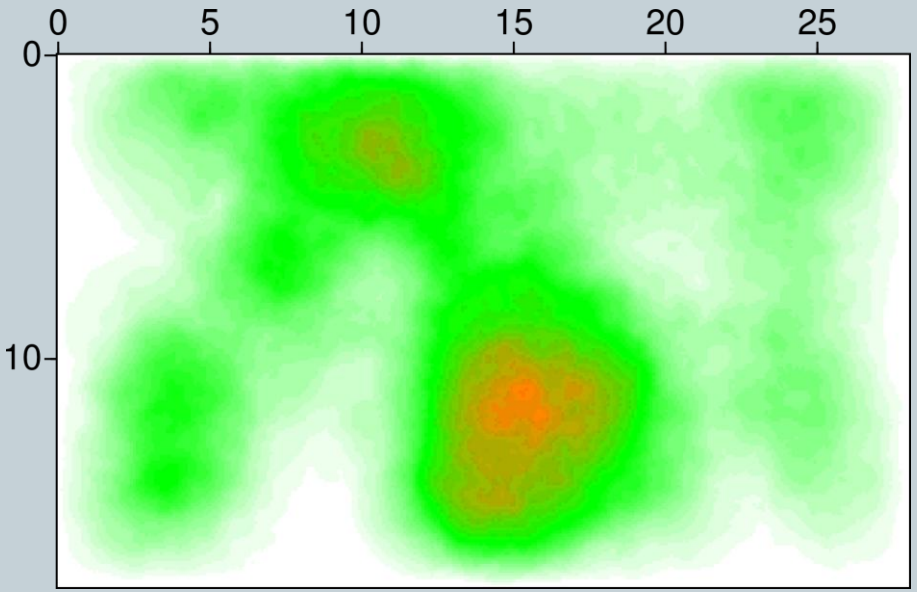


L’Aquila example



L’Aquila example





Two gaussians example