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Solid Earth Discussions

Interactive comment on "noisi: A Python tool for ambient noise cross-correlation modeling and noise source inversion" *by* Laura Ermert et al.

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This is an interesting paper about a tool for efficient modelling of noise cross-correlations with applications in noise source inversion. Overall the paper is well written, but at places it is can use some additional explanations.

Here are some examples:

It is not clear why the correlation function is first introduced in terms of integrals (eqs 2 and 4) and later discretized (eq 7). Since in this paper the correlation function is not used as a representation of a Green's function between x_1 and x_2, it seems that one doesn't need the integral form of eq 4. Wouldn't it make more sense to define the correlation function as a summation (like in eq 7) right from the start? (honoring the

fact that sources are in general sparsely and irregularly distributed, such as in Figures 3a and 6a). If there is a good reason to start with the integral representation then this should be clearly explained.

Figure 5 shows sensitivity kernels. This needs more explanation. I assume the left panel shows eq 6 as a function of xi, for fixed x_1 and x_2 (shown by the triangles) and fixed n and m. If this is correct, please state this explicitly (or if it is not correct, explain what it shows instead). How are omega_0 and omega_1 chosen? The right panel, which shows the function A of eq 8, needs even more explanation. There are no spatial variables in eq 8. I assume C in eq 8 is implicitly a function of x_1 and x_2, but not of xi. It remains unclear to me which of these variables are taken along the axes in the right panel of Figure 5.

Some minor points:

Lines 15-20: I suggest to add some references to the pioneering papers in each of the fields of application mentioned here.

Line 51: 'It presents a . . . alternative for cross-correlation modeling.' Why do you say 'an alternative'? Isn't cross-correlation modeling what the paper is about?

Line 93: The star instead of the bracket should be set as a superscript.

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