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Supporting Information for

Detailed nucleation process and mechanism of the July 2019 Mw 6.4 Ridgecrest, California earthquake

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Additional Supporting Information (Files uploaded separately)

Caption for Table S1

Caption for Movie S1

Introduction

This supporting information provides 40 figures, one table (separate from this file) and one movie (separate from this file) to support the discussions in the main text.

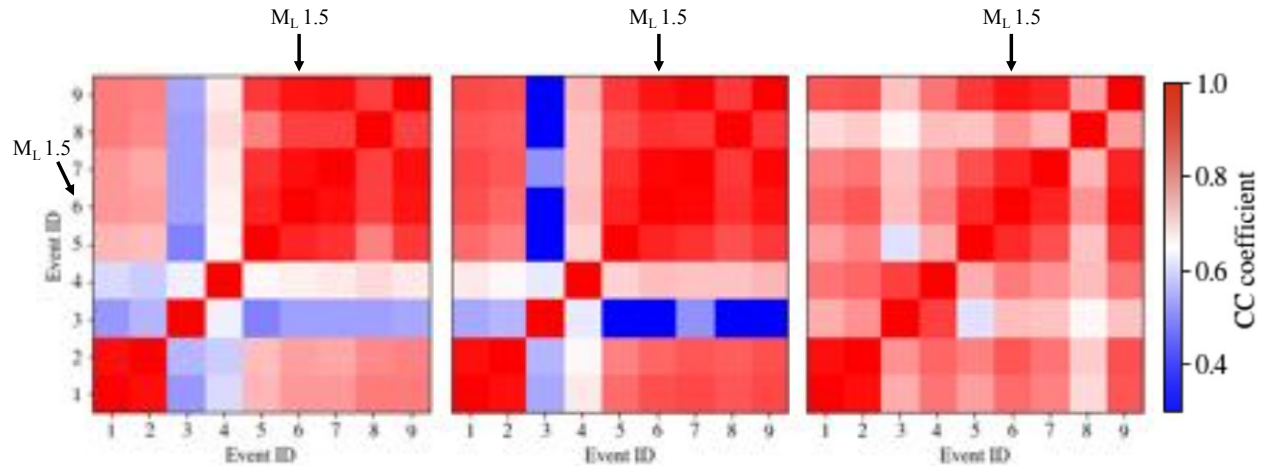


Figure S1. (a) Pairwise CC coefficients of S wave segments (0.2 s before and 1.8 s after the manually picked S wave arrival time) on the horizontal components (EH₁) of the nearest borehole station Bg21 for the 9 SCSN cataloged foreshocks. Black arrows mark the selected template event M_L 1.5 in this study. (b) Similar to (a), but for horizontal components of EH₂. (c) Similar to (a), but for P wave segments on vertical components.

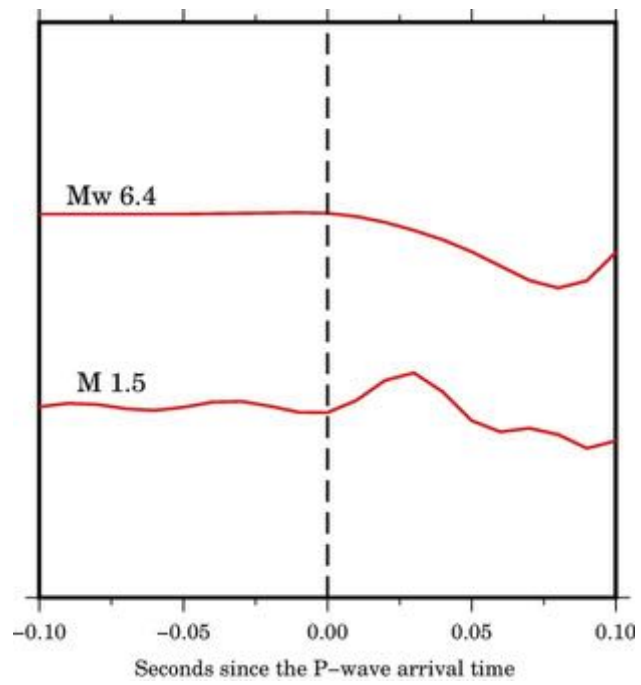
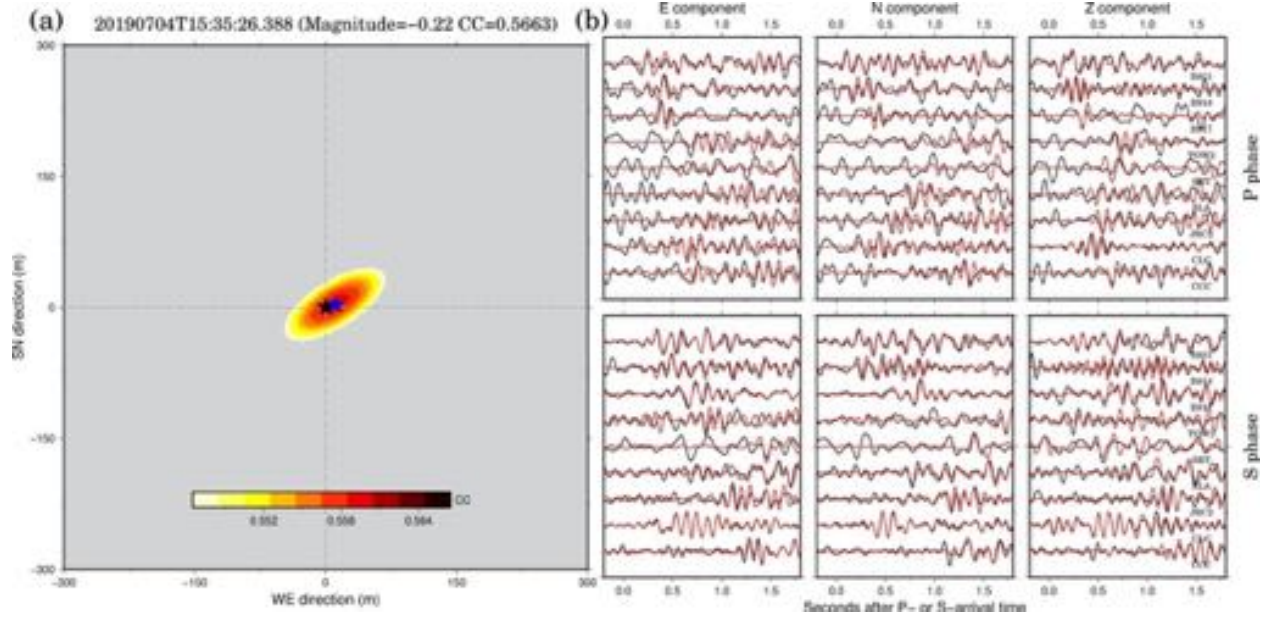
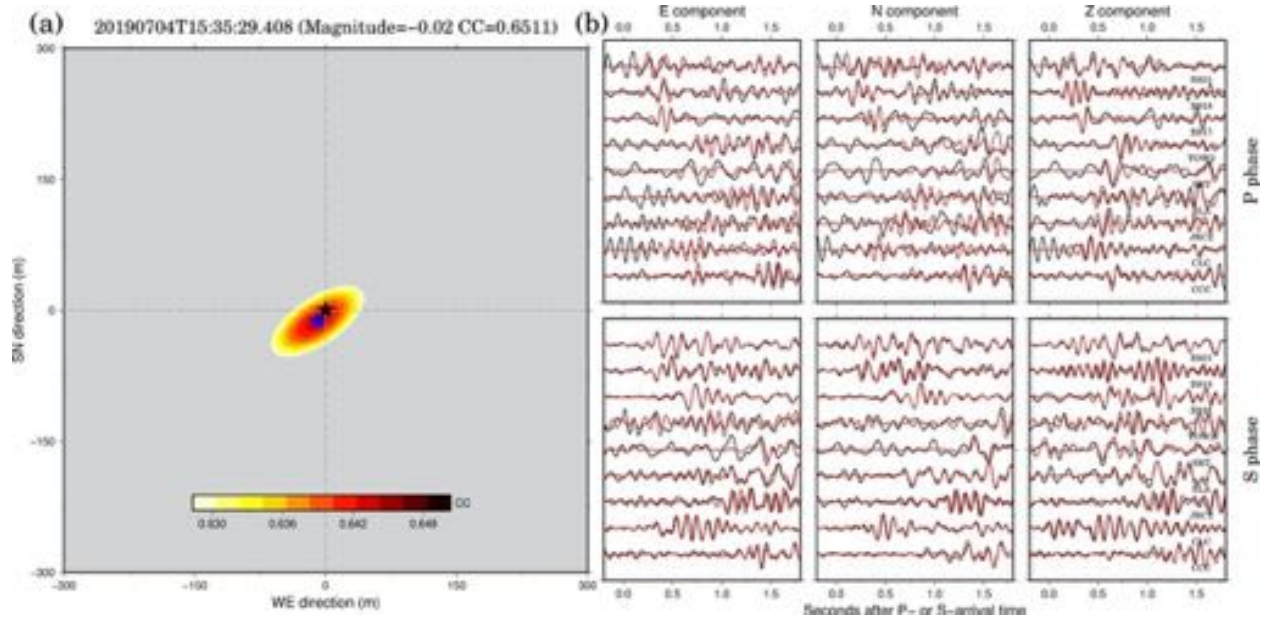


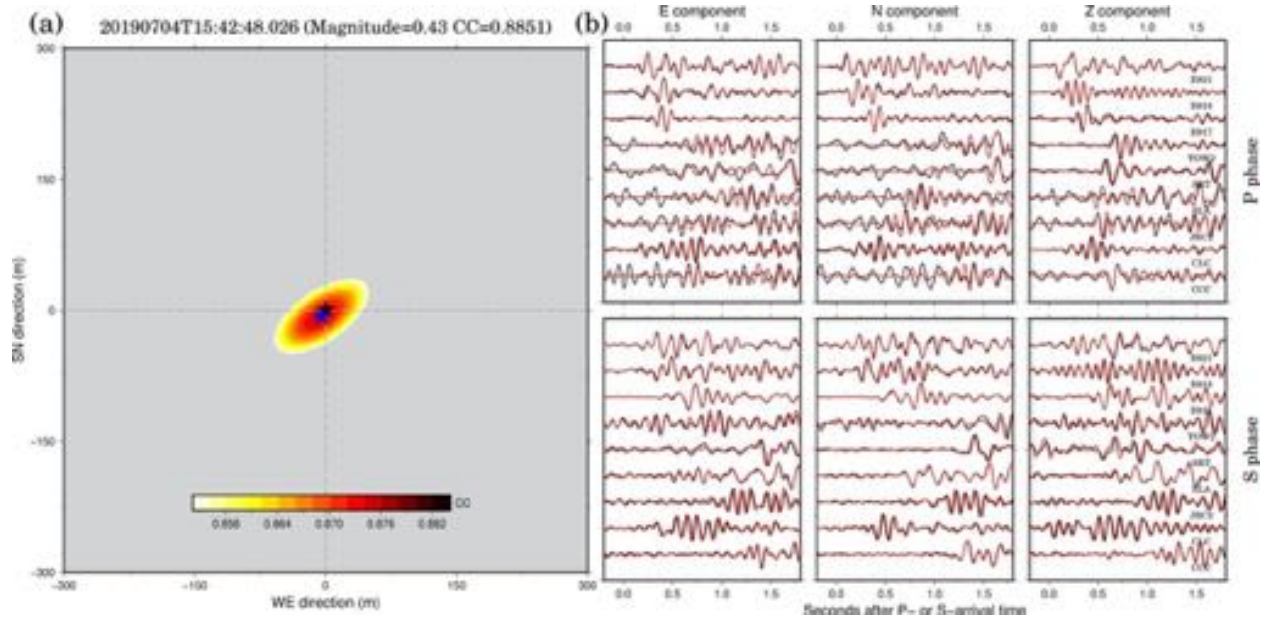
Figure S2. Comparison of the early P phase between the M_L 1.5 reference event and the Mw 6.4 mainshock. All traces were aligned according to the manual-picked P first arrivals.



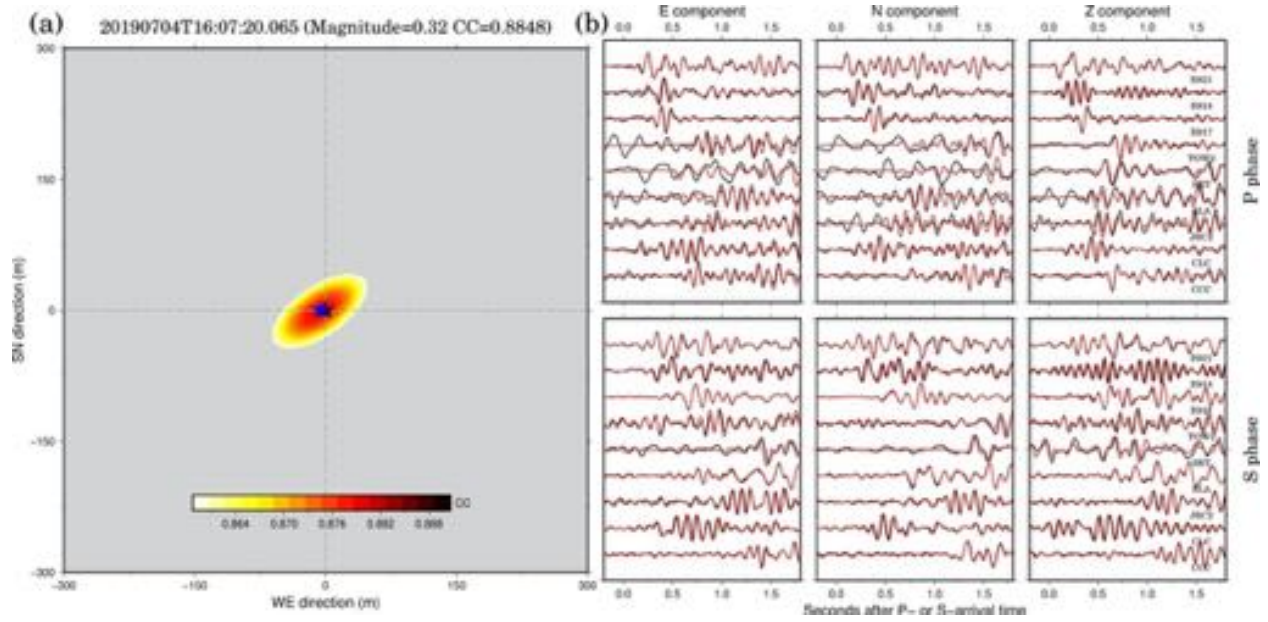
Figures S3. Horizontal CC convergence of EQ 1 (see event ID in Table S1) and its waveform comparison with the template event (M_L 1.5). (a) Black and blue stars represent the epicenters of the template and detected events, respectively. The distribution of averaged CC coefficients is shown with a color bar. (b) Waveform comparison of P phases (top panel) and S phases (bottom panel) between EQ 1 (red) and template (black) event, from nine three-component stations after relative travel time correction.



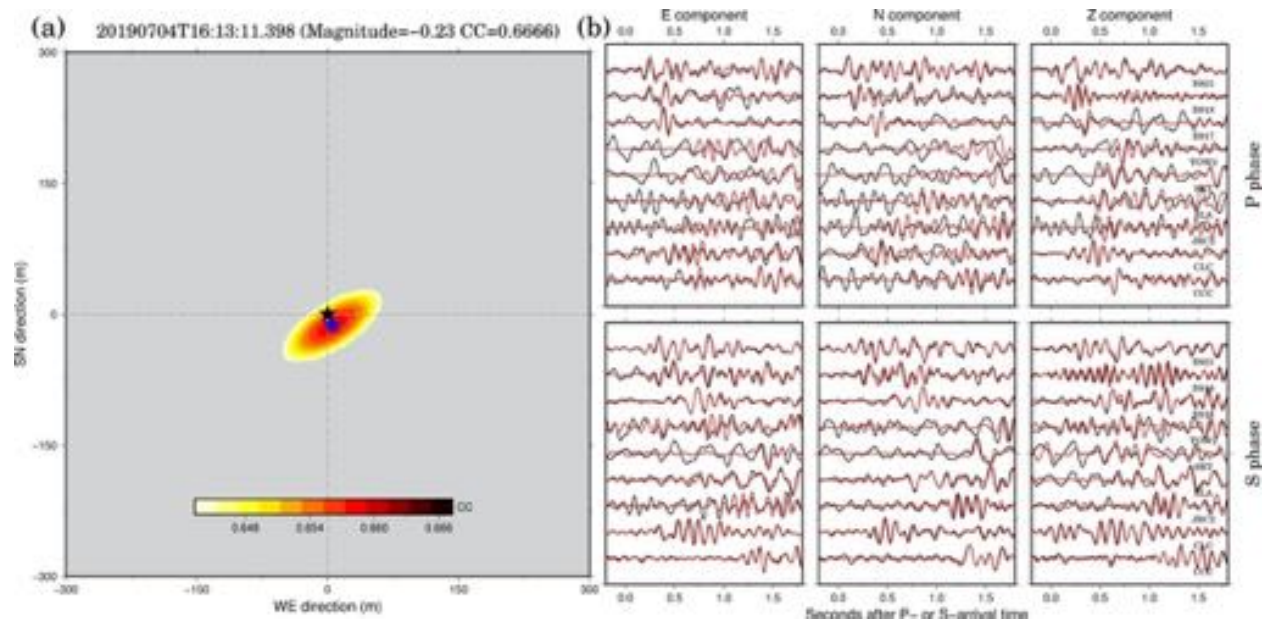
Figures S4. Similar to Figure S3, but for EQ 2.



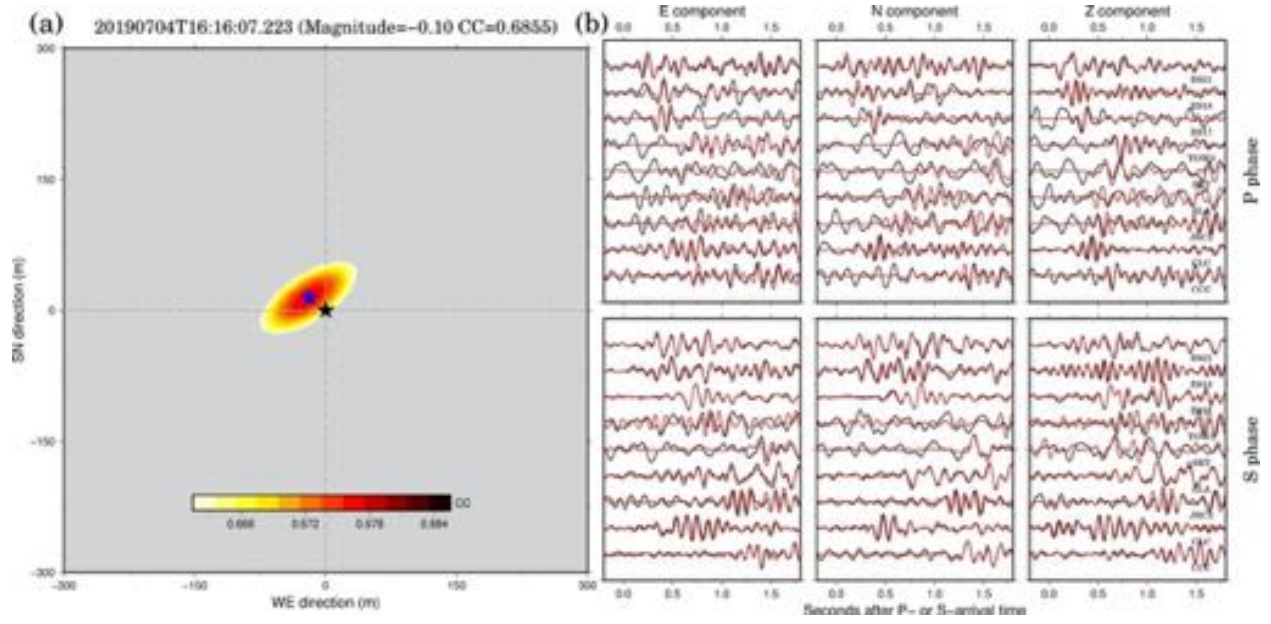
Figures S5. Similar to Figure S3, but for EQ 3.



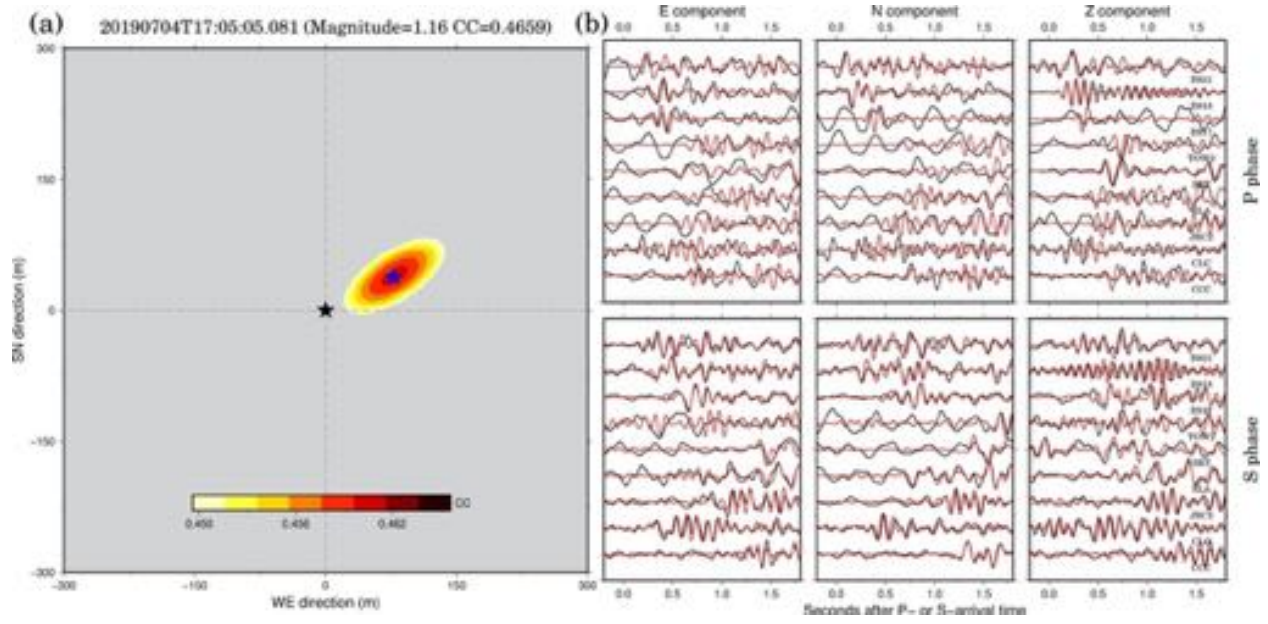
Figures S6. Similar to Figure S3, but for EQ 4.



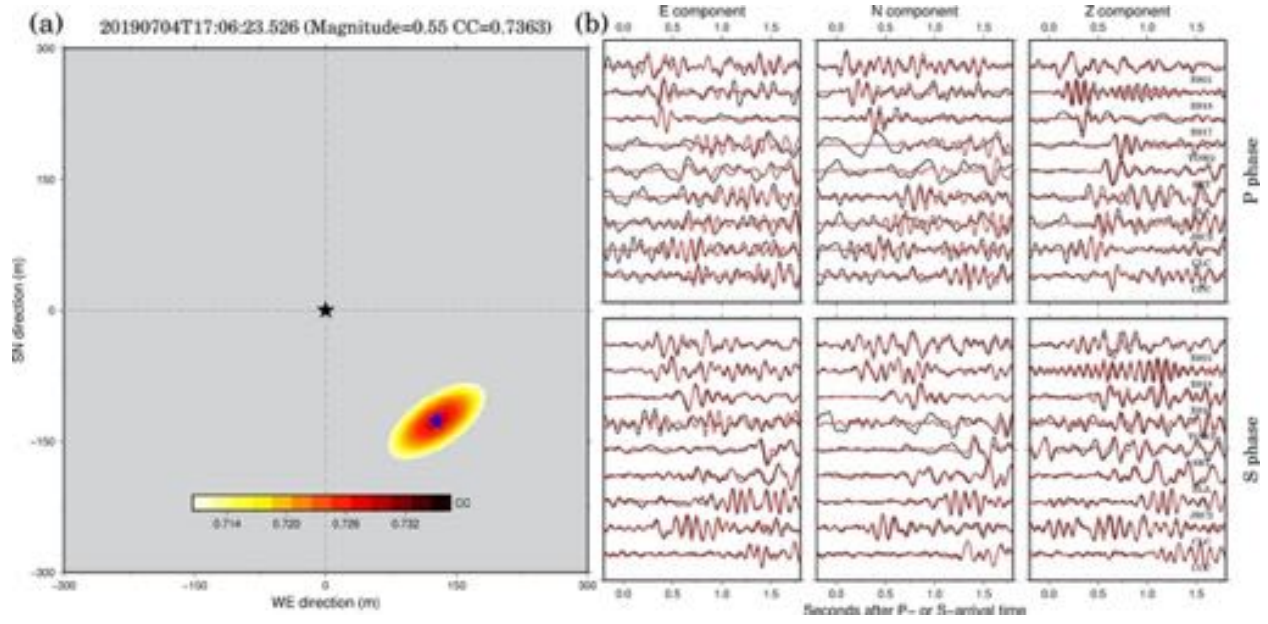
Figures S7. Smilar to Figure S3, but for EQ 5.



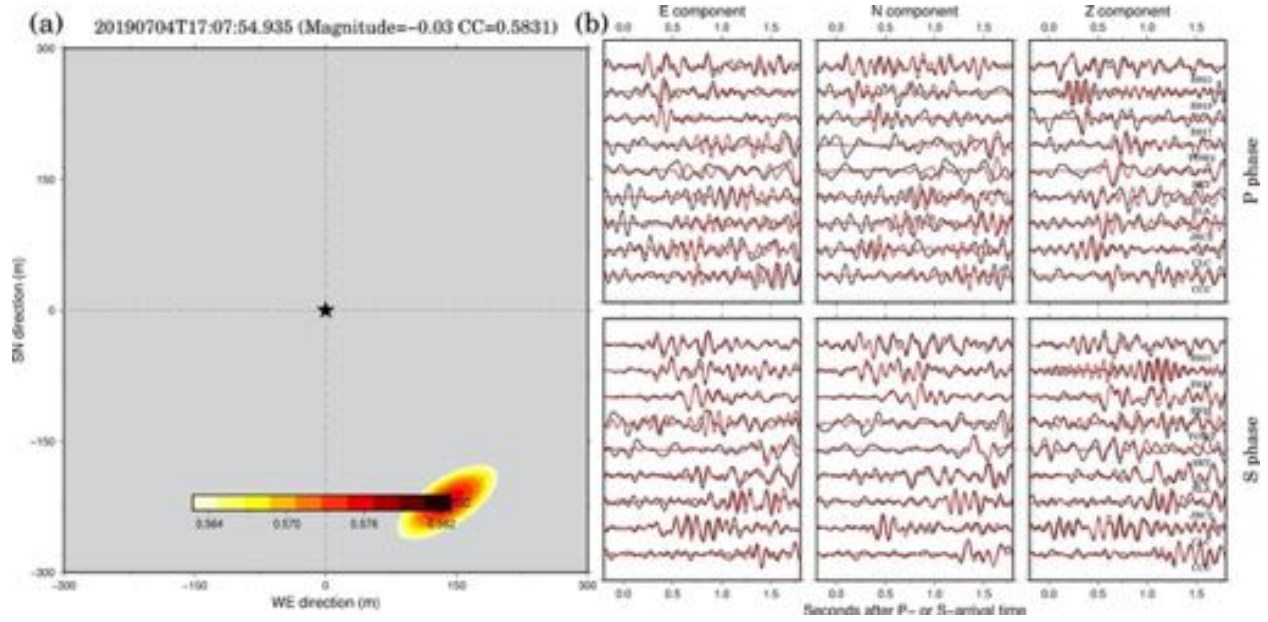
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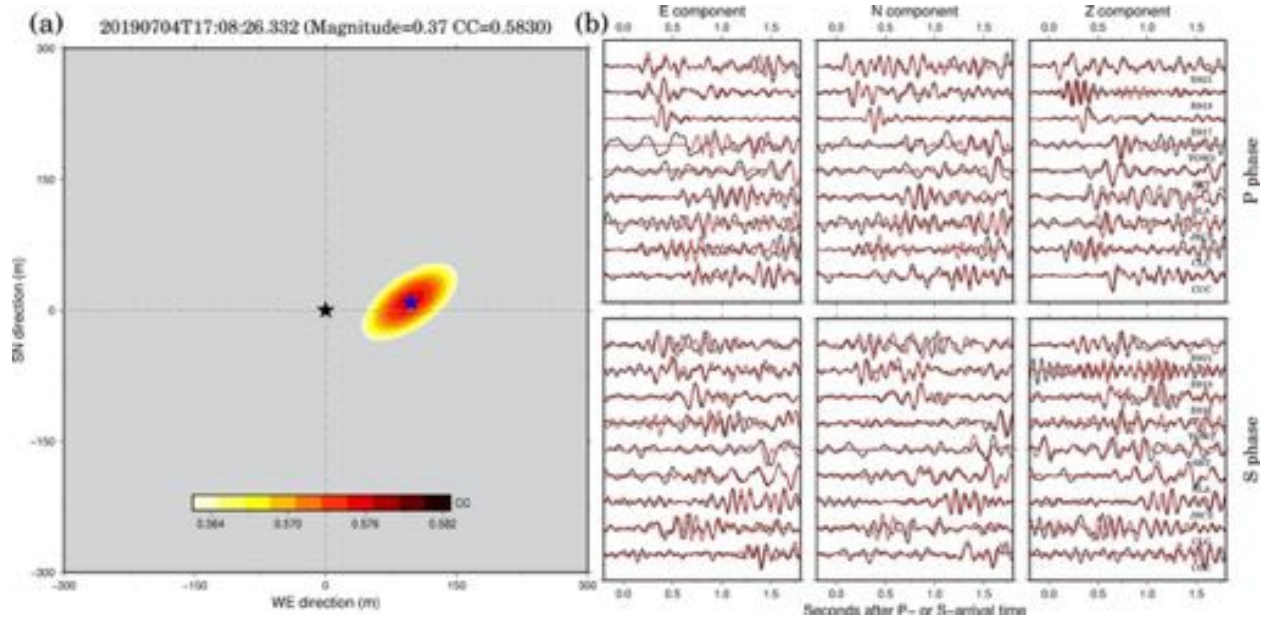
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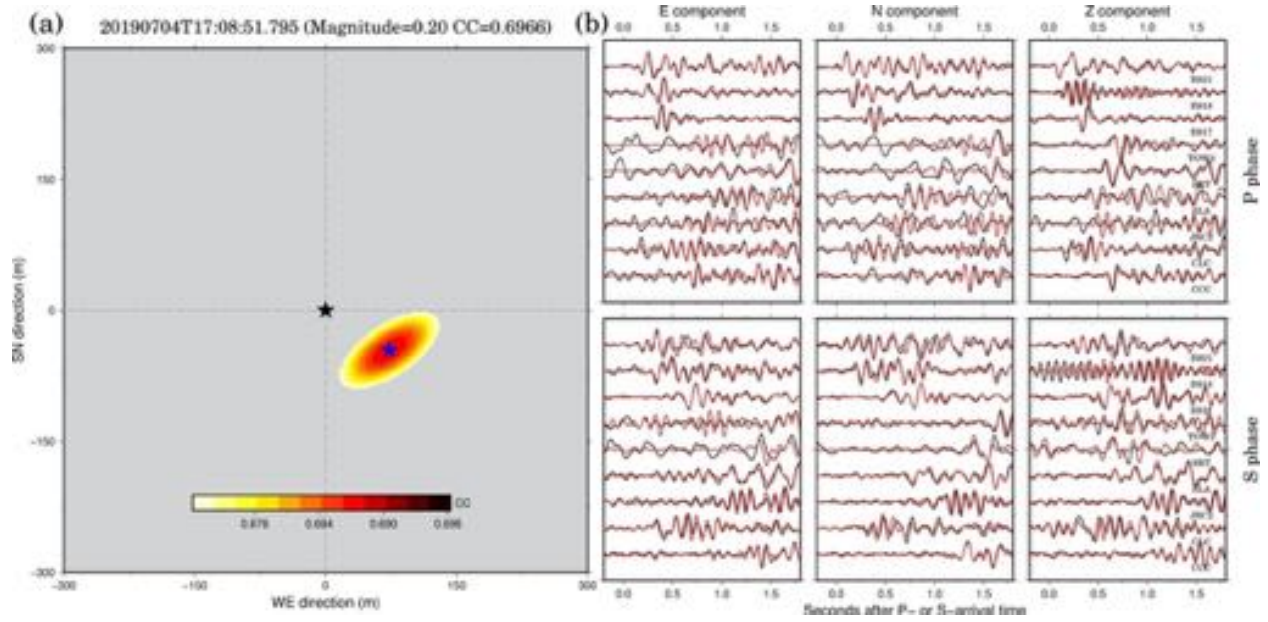
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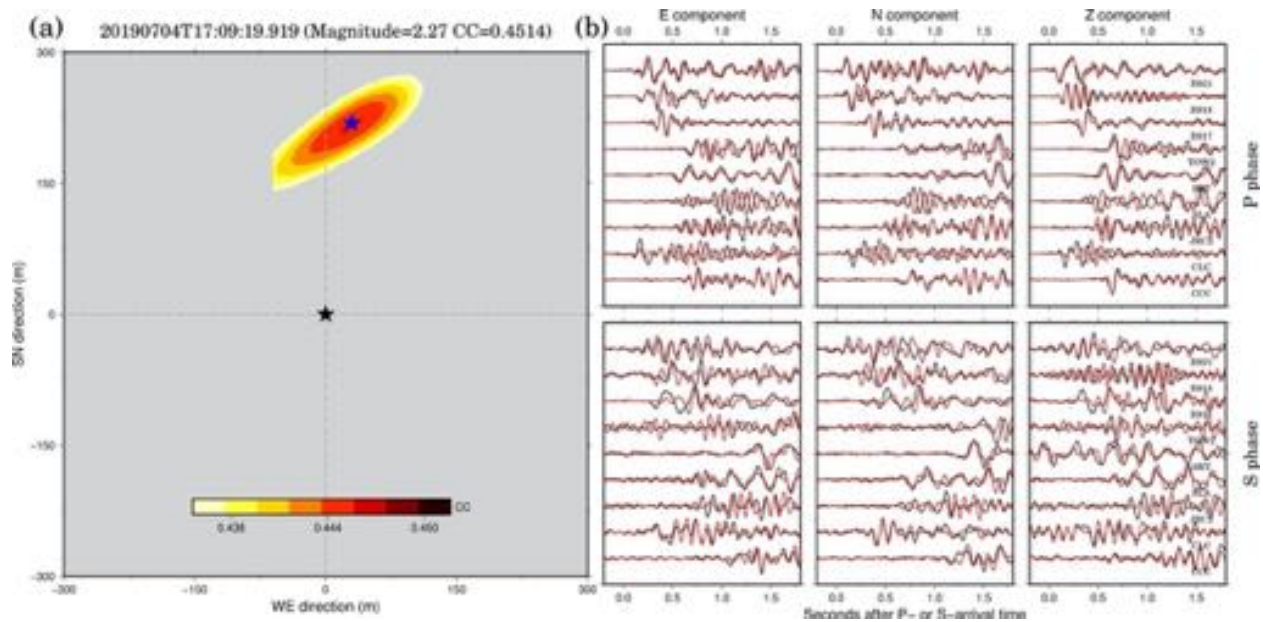
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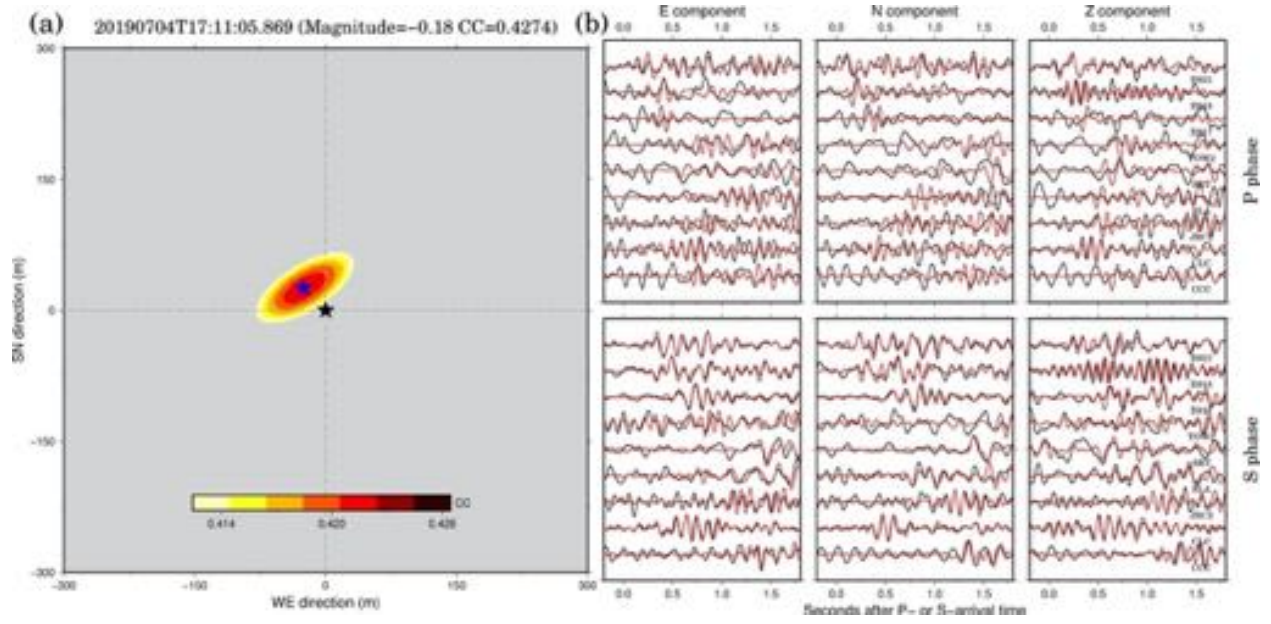
Figures S12. Similar to Figure S3, but for EQ 12.



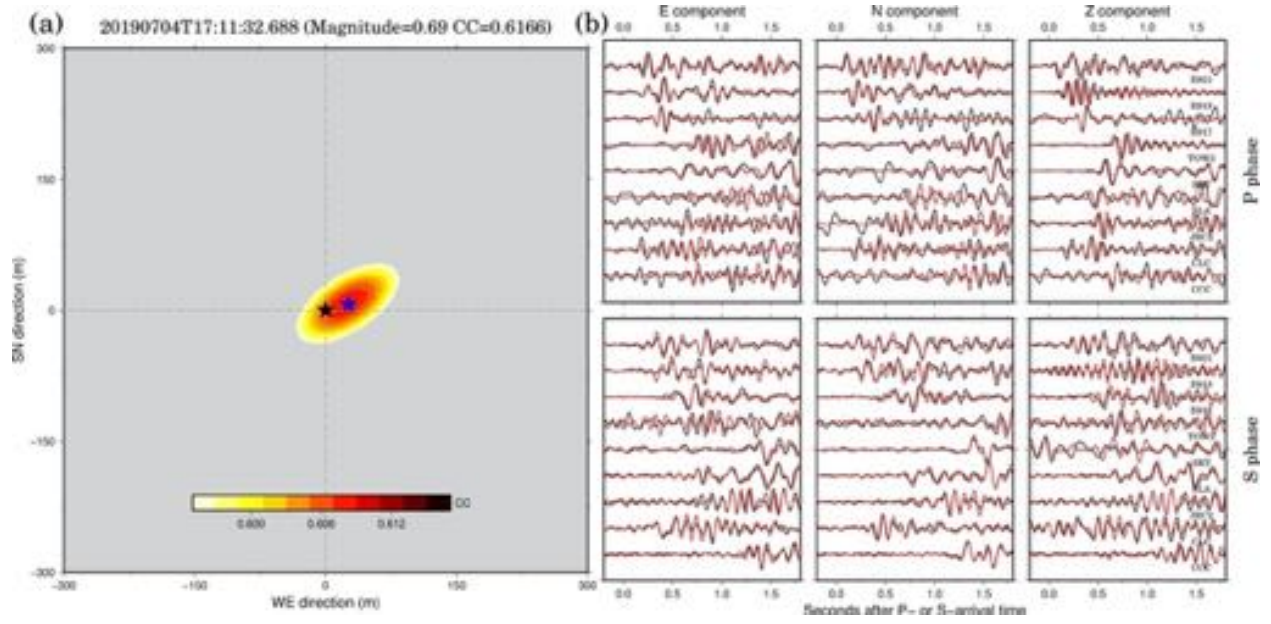
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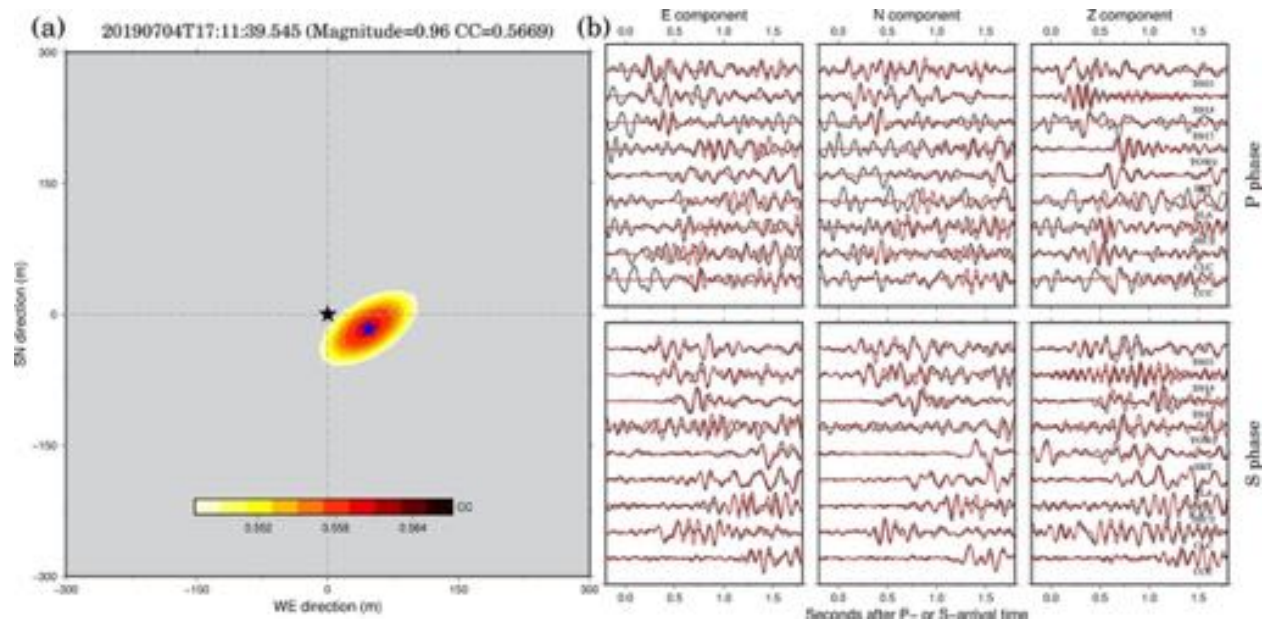
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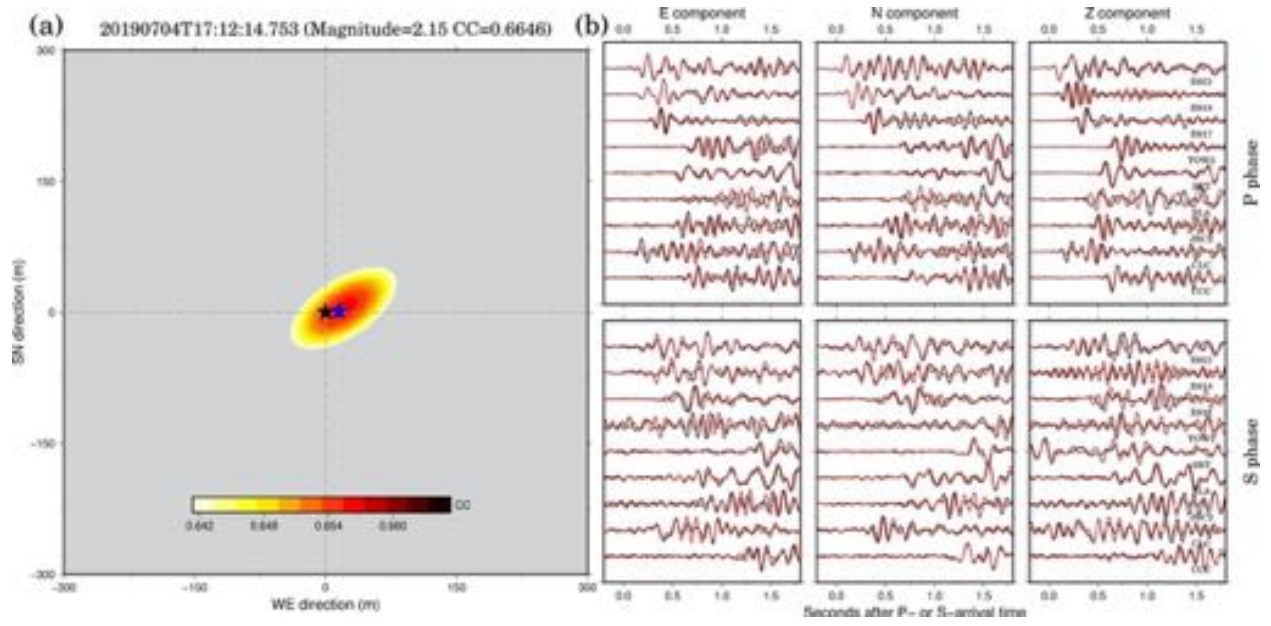
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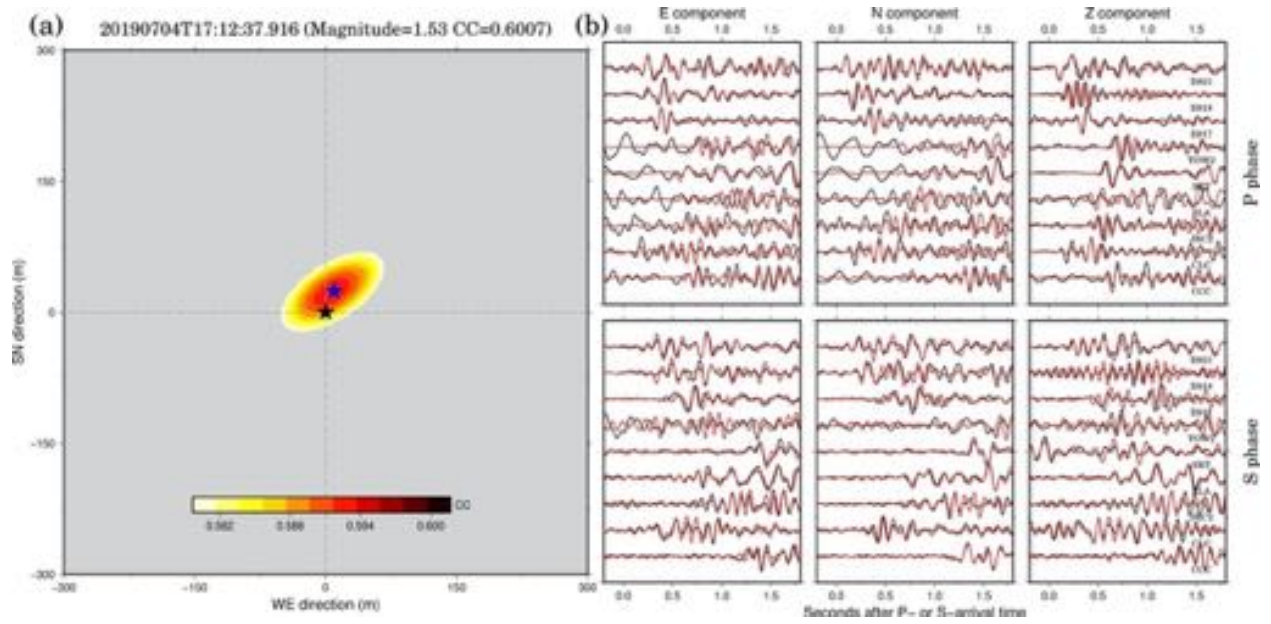
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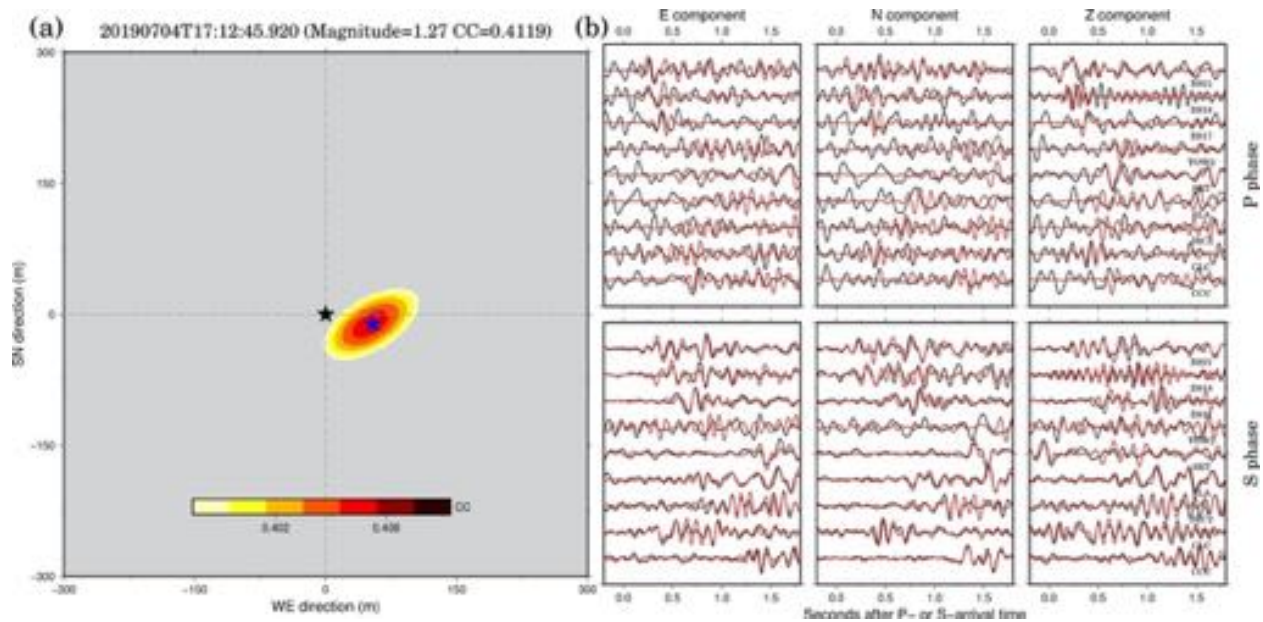
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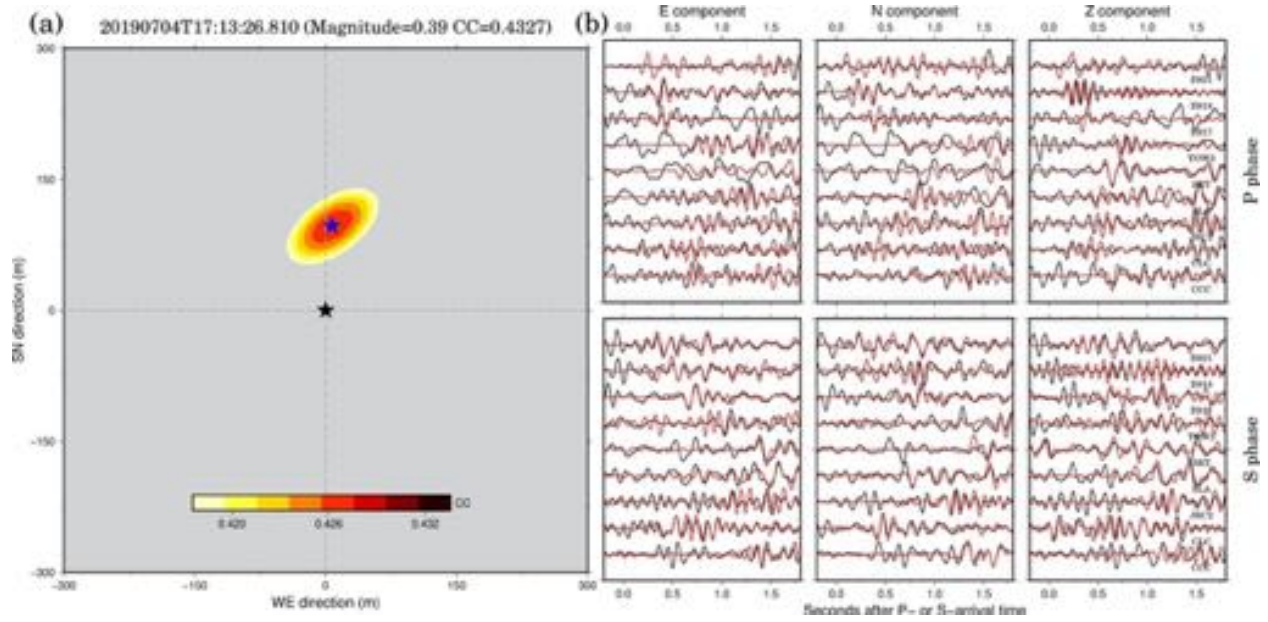
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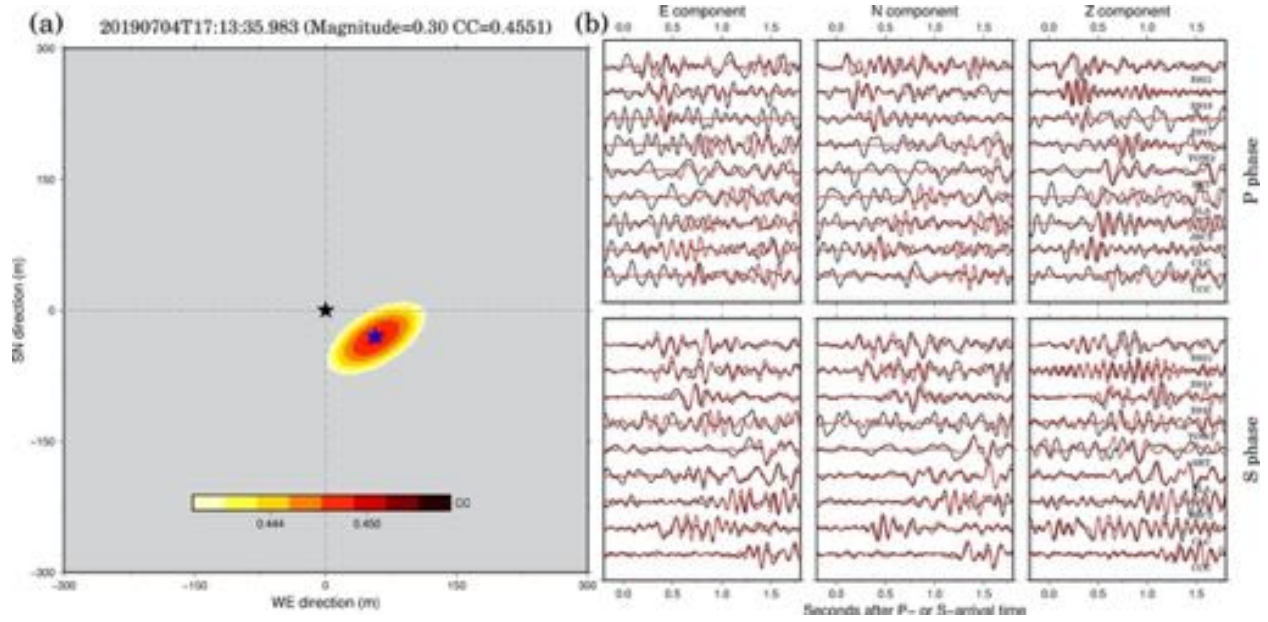
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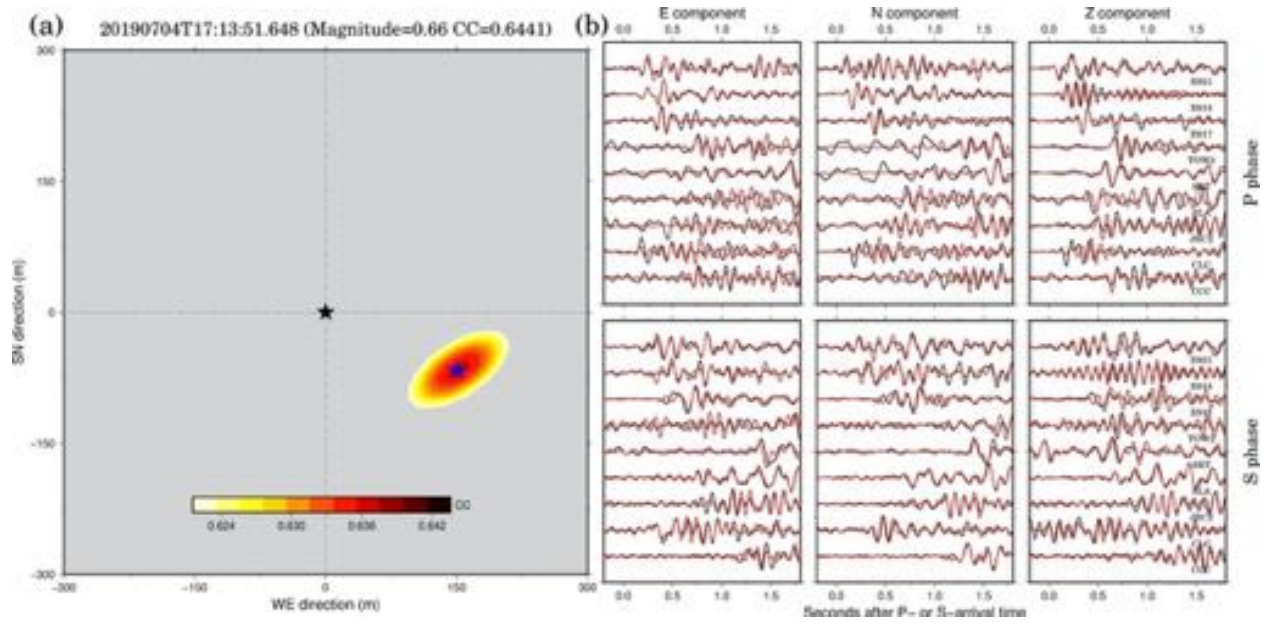
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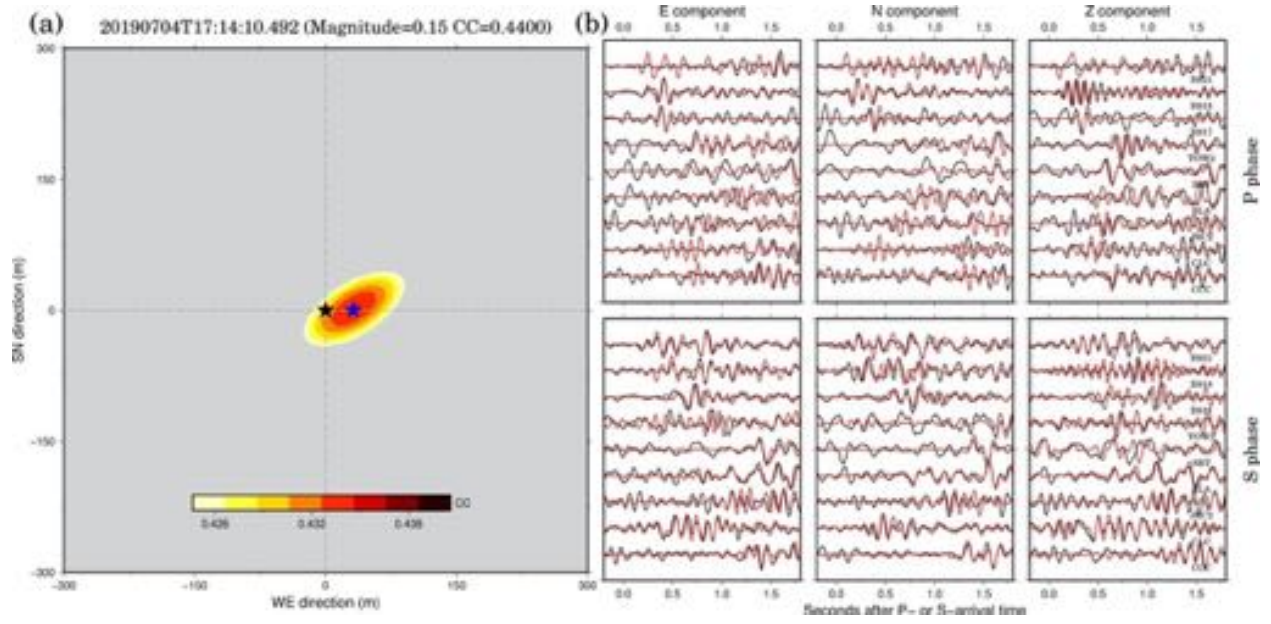
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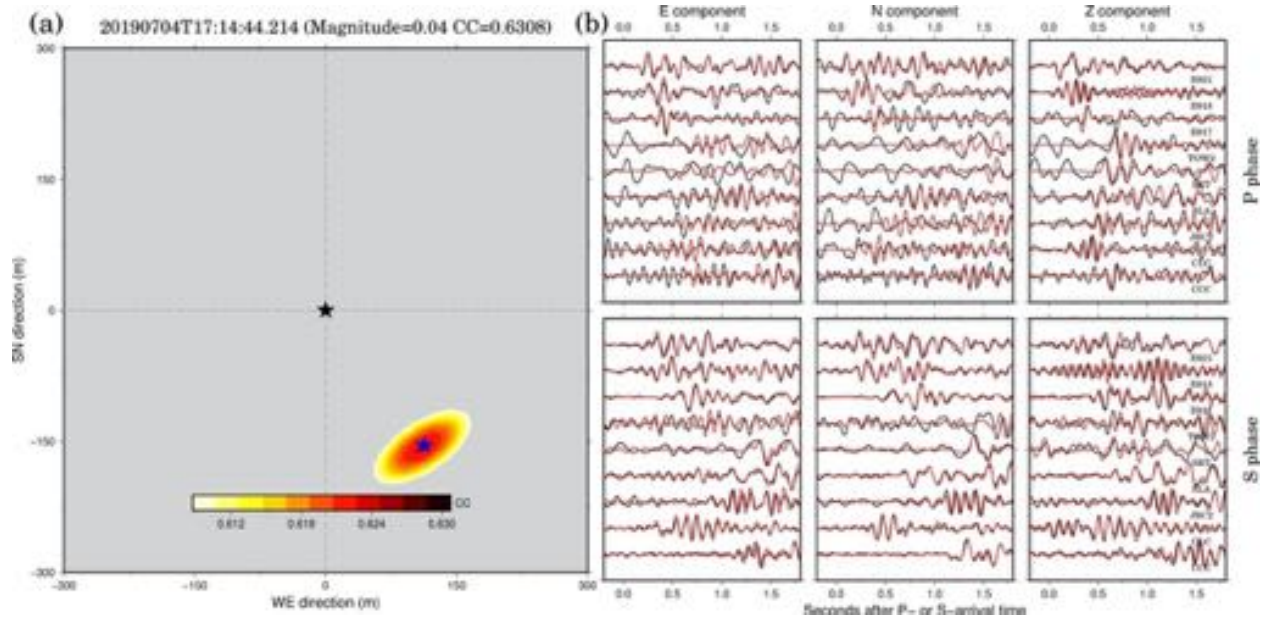
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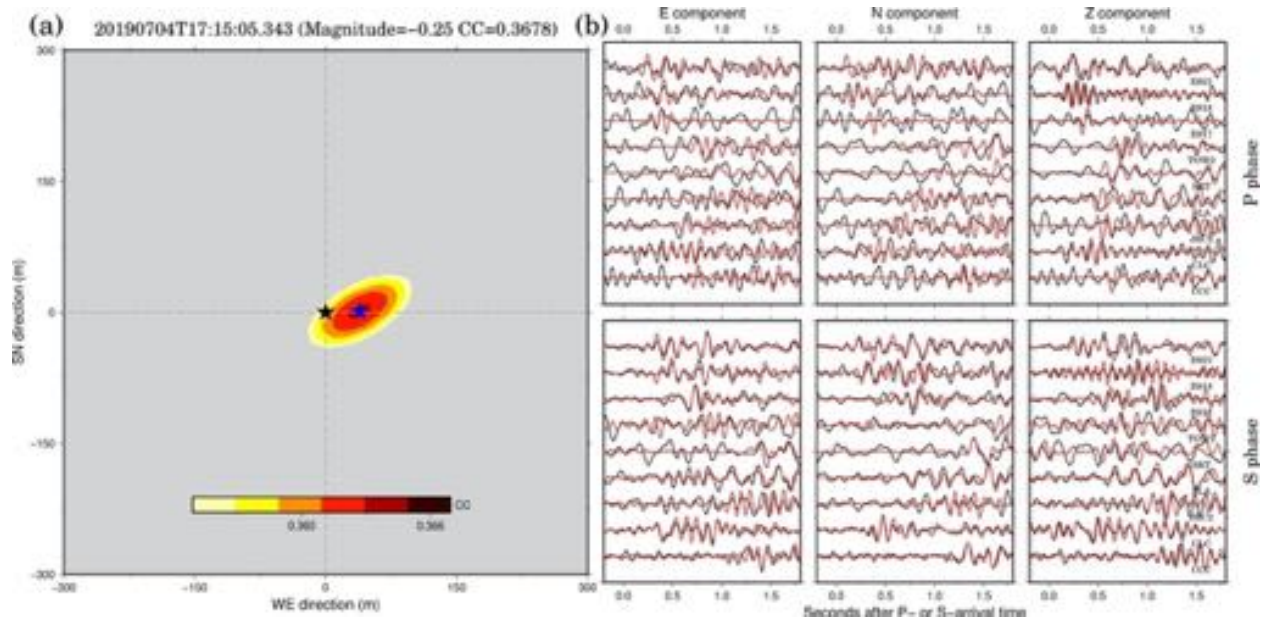
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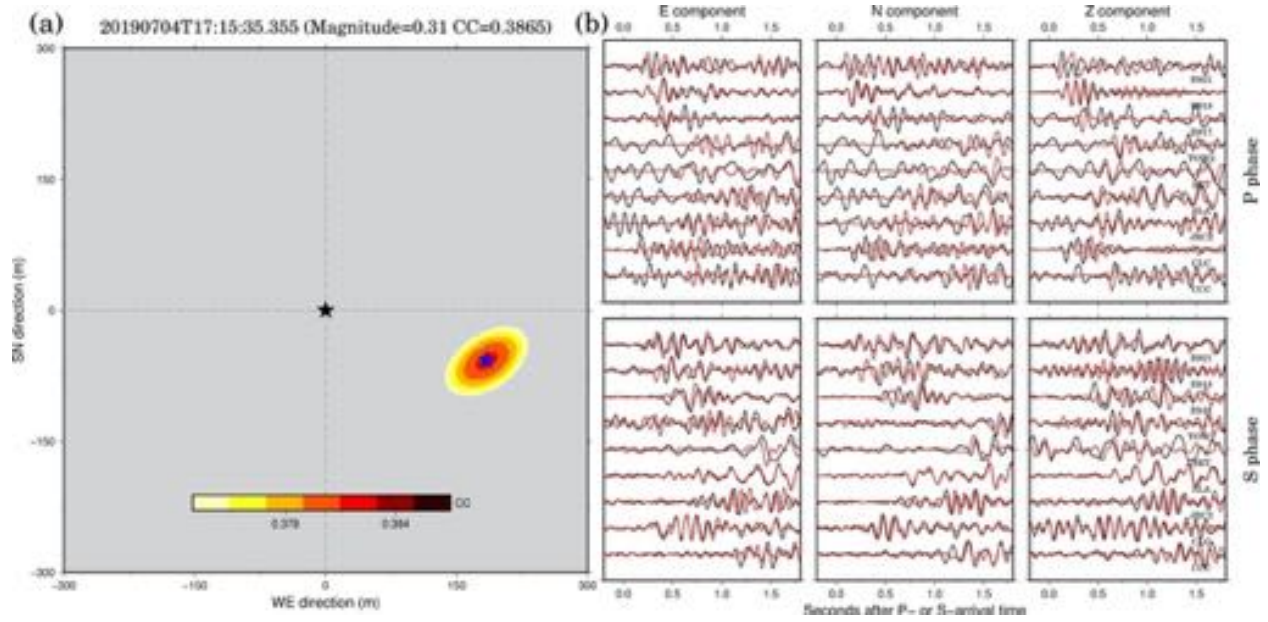
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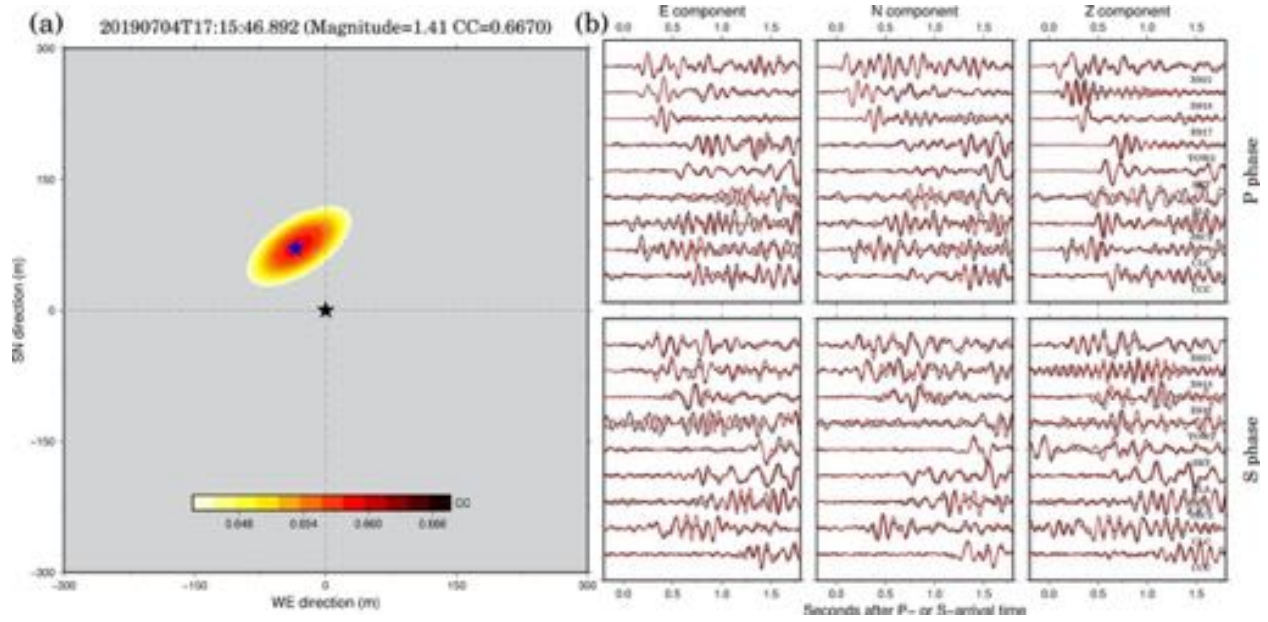
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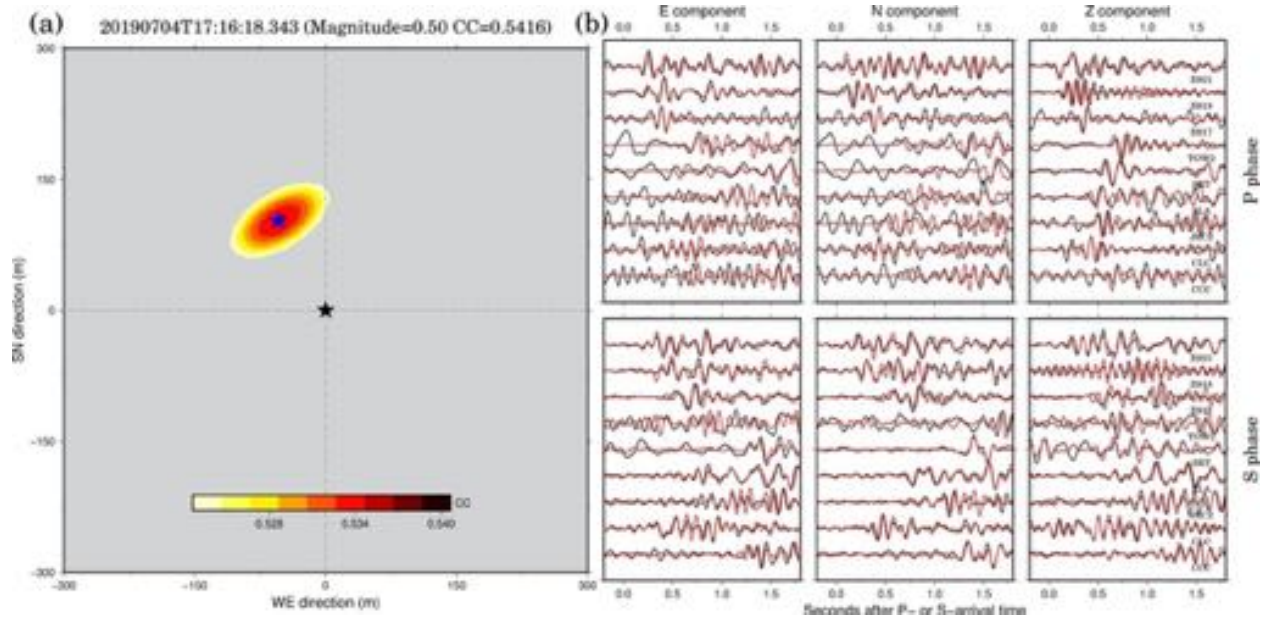
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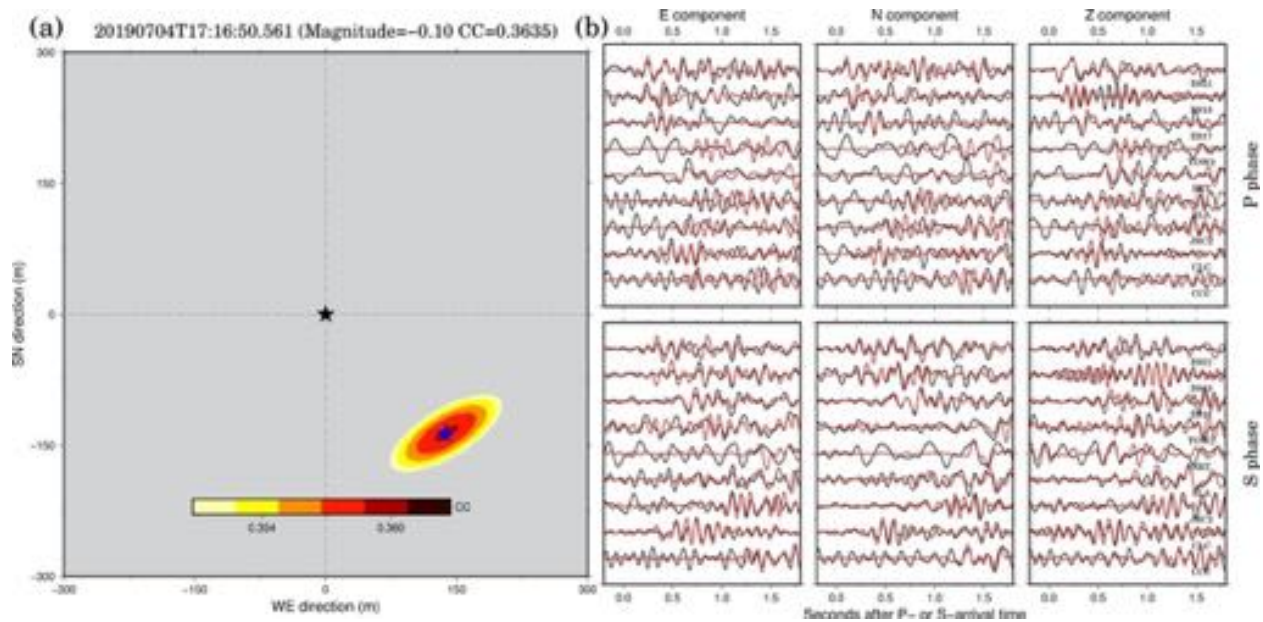
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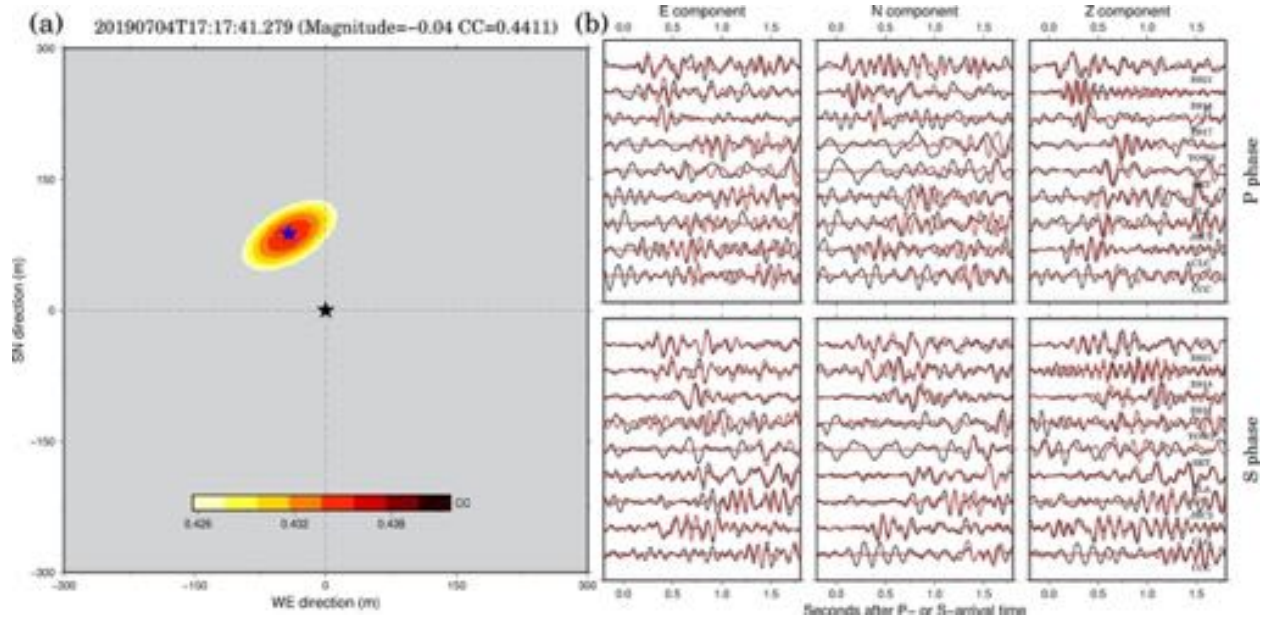
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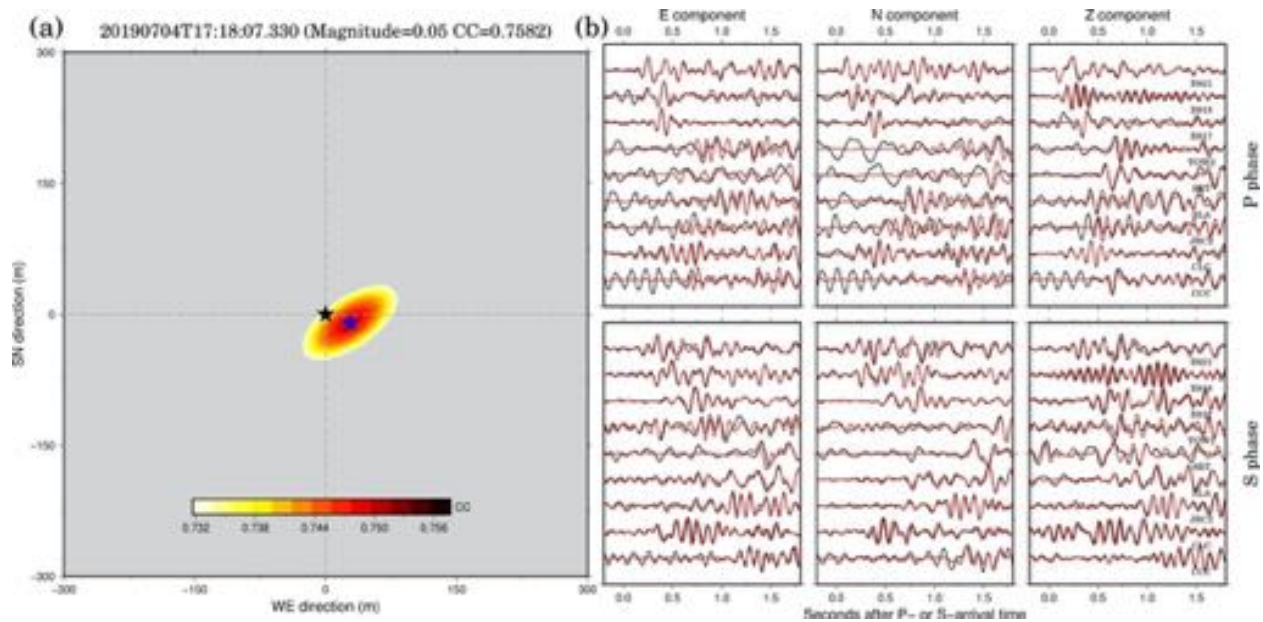
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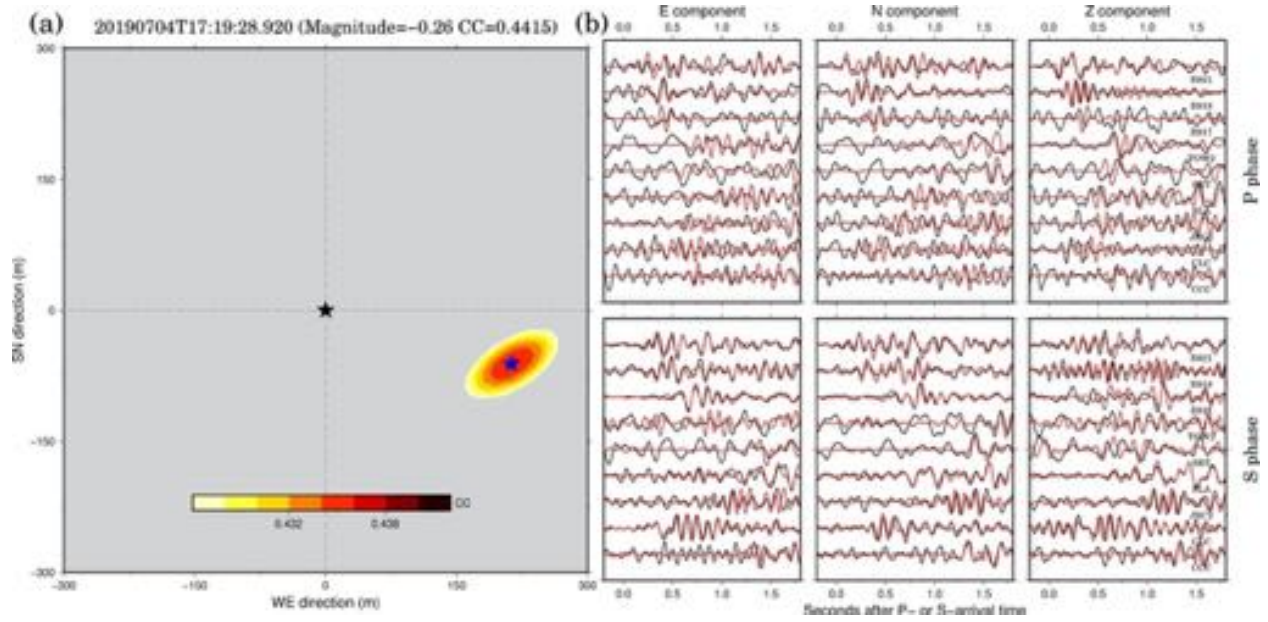
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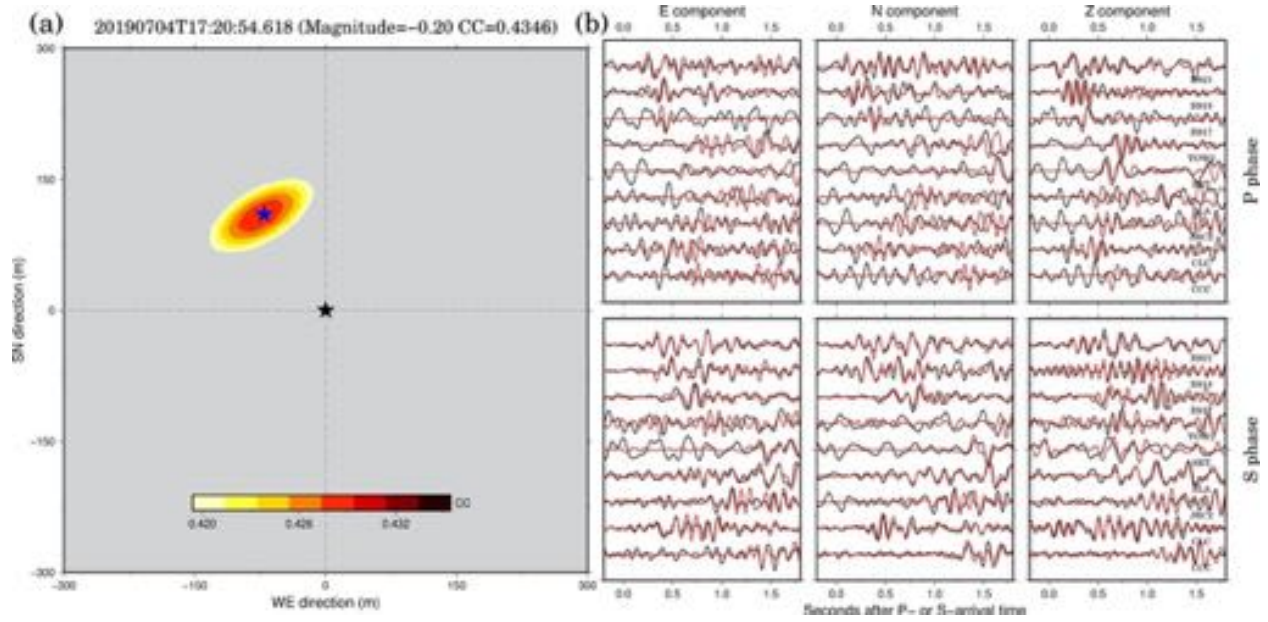
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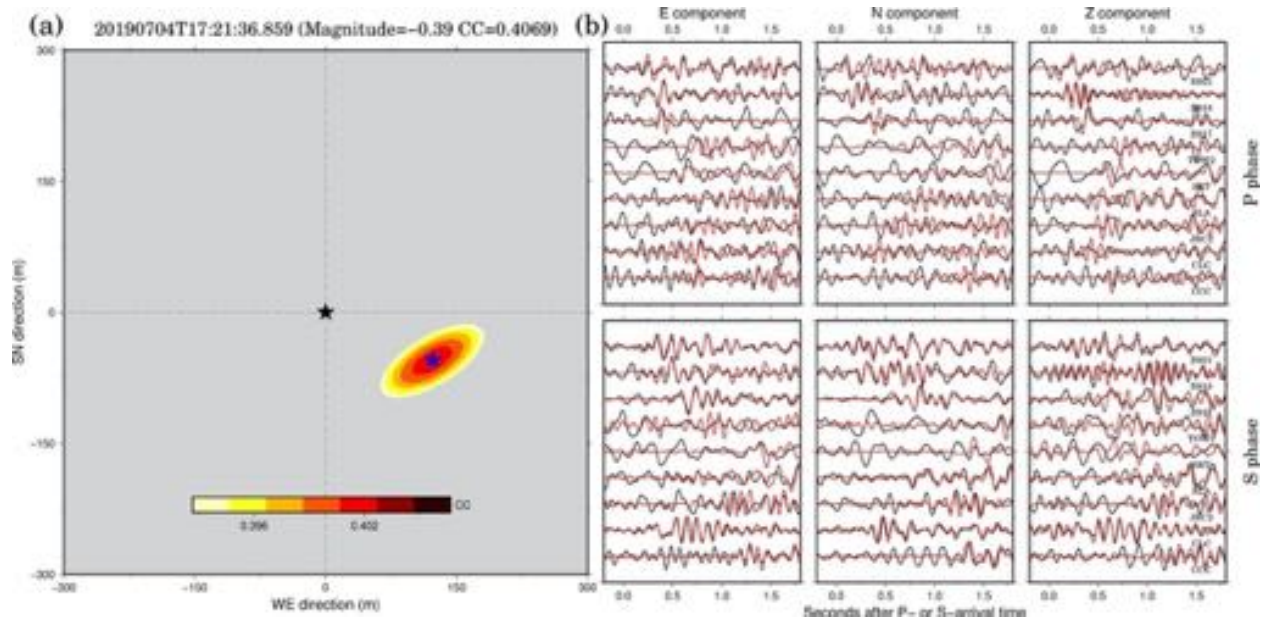
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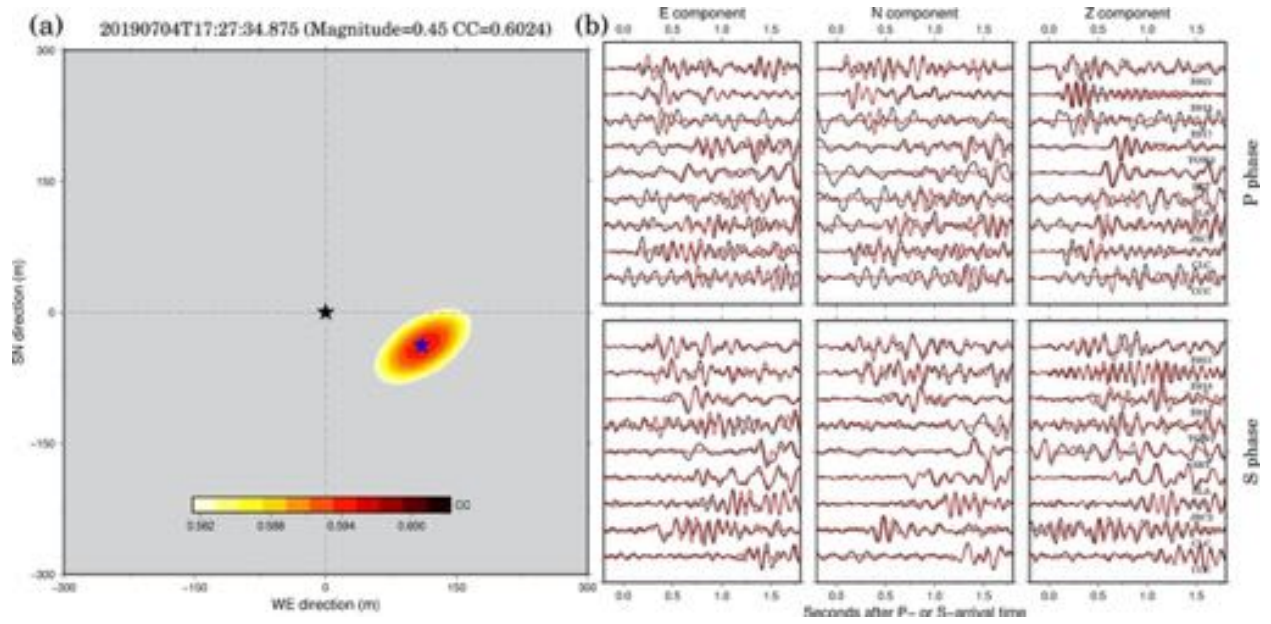
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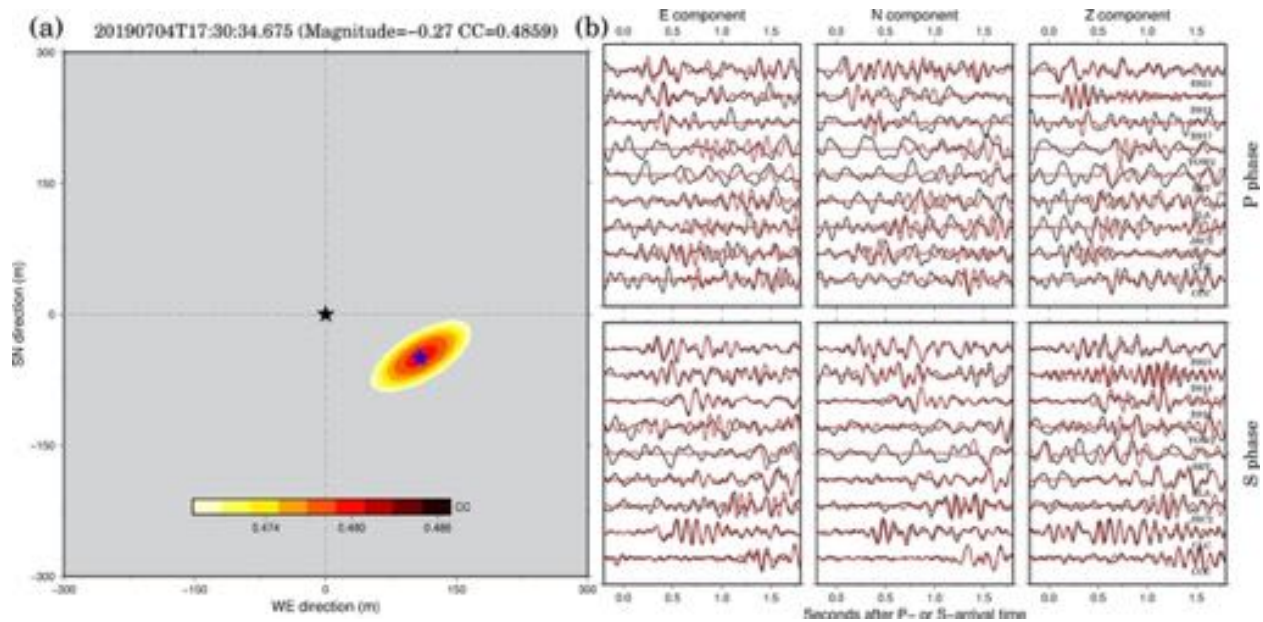
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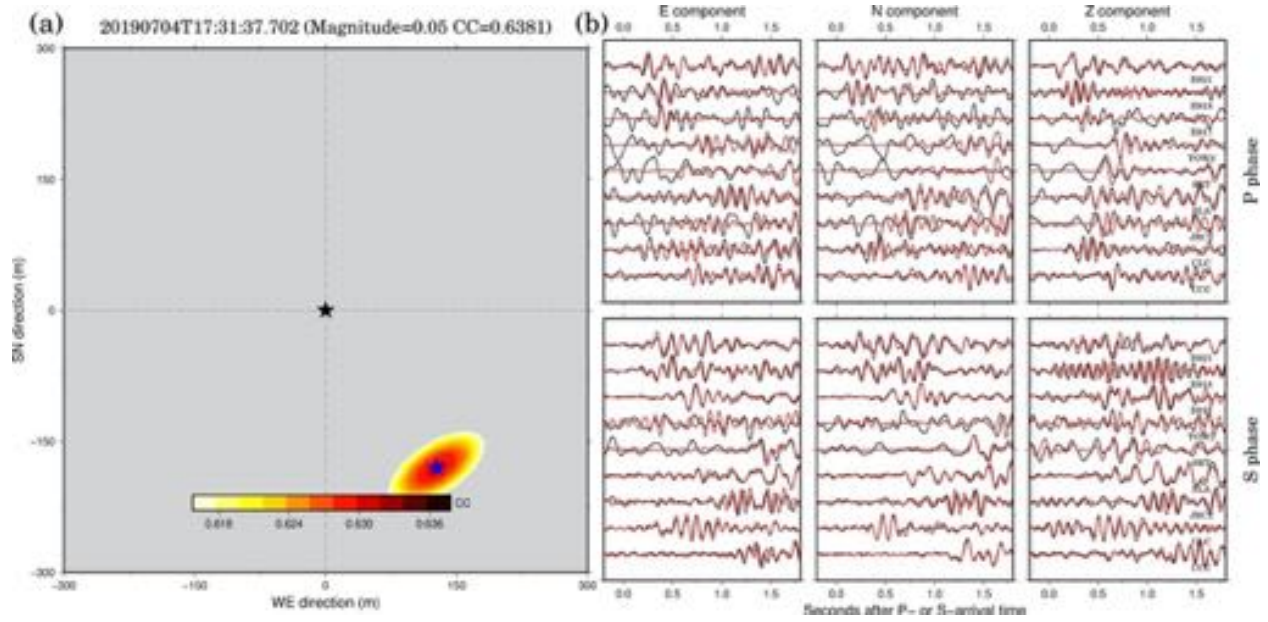
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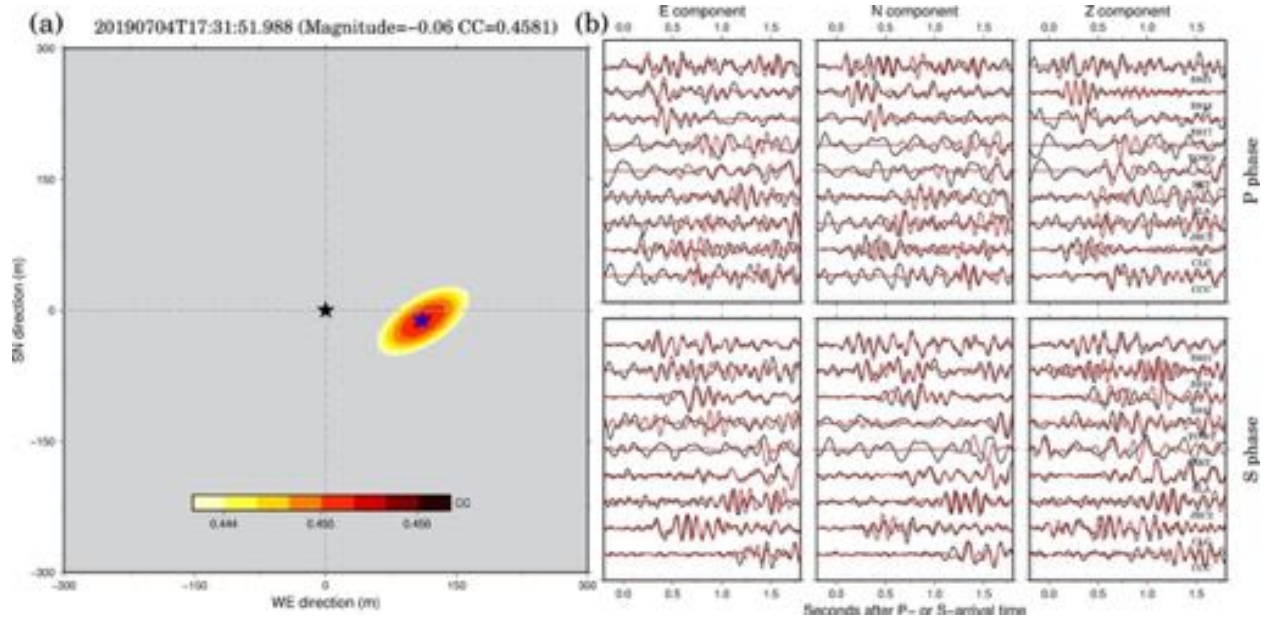
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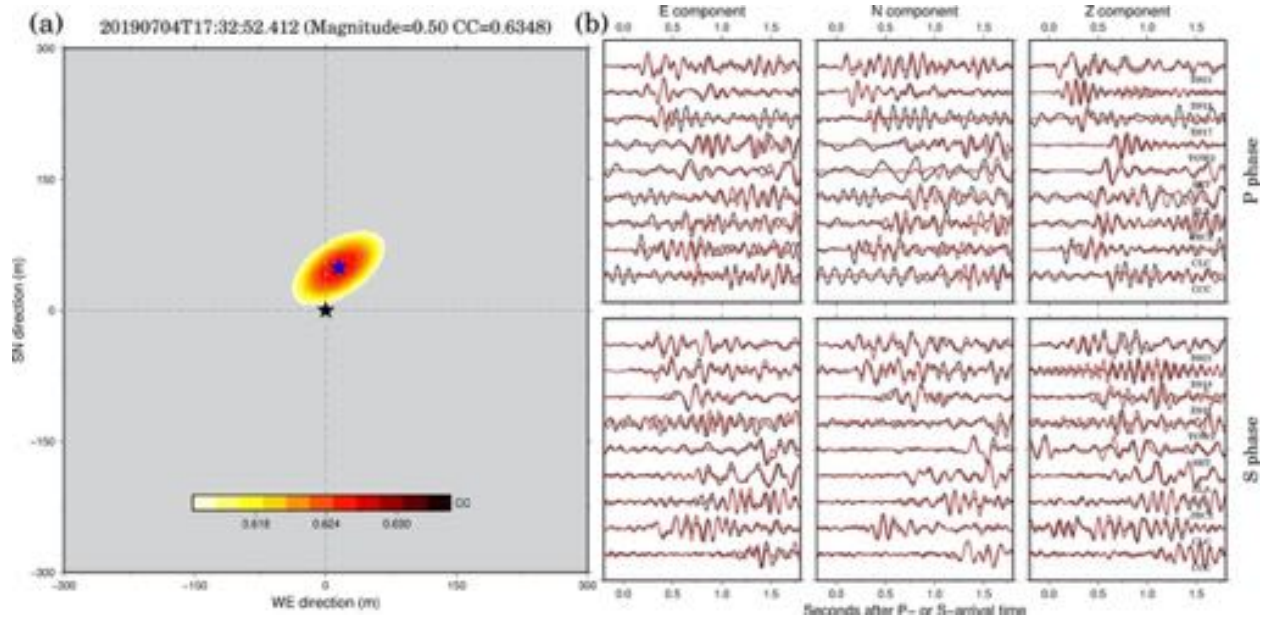
Figures S37. Similar to Figure S3, but for EQ 37.



Figures S38. Similar to Figure S3, but for EQ 38.



Figures S39. Similar to Figure S3, but for EQ 39.



Figures S40. Similar to Figure S3, but for EQ 40.

Table S1. The M&L foreshock catalog.

Movie S1. 3D movie showing detailed spatiotemporal distribution of these foreshocks listed in the M&L catalog (also see Figure 5).