

*Geosphere*

Supporting Information for

**Southern Chile Crustal Structure from Teleseismic Receiver Functions: Responses to Ridge Subduction and Terrane Assembly of the Patagonian Microplate**

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**Introduction**

This supporting material includes the receiver function stacks,  $H-k$  grid search and bootstrapping results for each station, reported in tables and with their individual grid search result figures.

**Table S1.**  $H$ - $k$  and  $H$ - $k$  bootstrap results for the CRSP network (3 letter coded).

Station	Lat. (°)	Lon. (°)	Elevation (m)	$H$ value (km)	$k$ value	Bootstrap $H$ value (km)	Bootstrap $k$ value	RFs
AGU	-45.1508	-73.5089	49.6	43.1	1.79	42.7 +/- 4.2	1.80 +/- 0.08	7
AMG	-44.7475	-72.2136	352	40.6	1.73	38.9 +/- 6.2	1.76 +/- 0.10	6
BAK	-47.1840	-71.9735	563.7	42.7	1.68	41.7 +/- 4.9	1.71 +/- 0.09	11
BMU	-46.4358	-72.6720	360.7	32	1.84	36.6 +/- 4.7	1.75 +/- 0.11	19
CAL	-45.4794	-71.6035	778.2	24.9	1.68	27.4 +/- 4.0	1.73 +/- 0.08	29
CHB	-45.4616	-71.8165	57.3	31	1.67	42.9 +/- 2.9	1.78 +/- 0.06	4
CHC	-46.5415	-71.7351	347.1	31.3	1.77	43.9 +/- 9.5	1.78 +/- 0.10	20
CHN	-46.9179	-72.7351	498	32.9	1.79	32.2 +/- 2.2	1.76 +/- 0.06	8
COC	-47.2560	-72.5920	177.2	32.9	1.79	35.0 +/- 6.2	1.73 +/- 0.10	20
COY	-45.5639	-72.0911	390.2	31.6	1.62	28.8 +/- 4.0	1.73 +/- 0.07	9
CTS	-44.7339	-72.6795	52.3	41.2	1.61	39.2 +/- 3.4	1.71 +/- 0.13	9
FNL	-46.5516	-72.2219	256.2	42.3	1.64	39.5 +/- 3.9	1.64 +/- 0.08	4
HOP	-46.7269	-75.4333	72	27.1	1.64	27.5 +/- 3.5	1.65 +/- 0.05	9
HUD	-46.0505	-72.6899	473.3	36	1.77	35.8 +/- 3.8	1.77 +/- 0.06	6
HUM	-45.5577	-73.9591	88.2	38.2	1.84	39.2 +/- 4.9	1.78 +/- 0.10	5
IBJ	-44.6861	-73.9899	70.3	48.4	1.89	43.6 +/- 8.0	1.84 +/- 0.09	8
IMG	-44.4017	-73.0914	35.2	33	1.7	35.8 +/- 5.7	1.67 +/- 0.05	9
ISM	-45.9276	-73.8312	40.9	27.8	1.92	28.6 +/- 4.7	1.92 +/- 0.05	13
JEI	-46.8318	-71.9951	877.7	32.6	1.71	32.7 +/- 3.5	1.71 +/- 0.08	20
LPL	-45.3198	-72.7075	104.6	33	1.79	36.2 +/- 6.6	1.77 +/- 0.10	6
LRC	-47.2829	-72.8655	141.6	36.2	1.71	38.4 +/- 4.1	1.71 +/- 0.08	5
LSR	-46.6615	-73.8586	55.3	26.8	1.64	28.4 +/- 4.7	1.64 +/- 0.04	29
LTQ	-46.64192	-72.7981	470	31.8	1.82	32.9 +/- 4.7	1.81 +/- 0.06	37
MEL	-43.8555	-73.7427	122.3	56.5	1.77	55.3 +/- 5.0	1.77 +/- 0.07	27
MRF	-46.7256	-72.9363	298.5	44	1.66	39.0 +/- 6.3	1.66 +/- 0.06	18
NWM	-46.4409	-74.8939	57.3	29.6	1.63	29.2 +/- 0.9	1.64 +/- 0.02	4

PDR	-46.3024	-71.8608	398.8	51.5	1.77	53.0 +/- 2.3	1.75 +/- 0.03	4
PLM	-46.1773	-74.4318	85.7	32.7	1.86	36.0 +/- 5.2	1.82 +/- 0.09	9
PYU	-44.3233	-72.5552	51.2	45	1.68	41.5 +/- 5.3	1.72 +/- 0.09	15
RCS	-44.4962	-71.3168	817.8	28.5	1.61	28.1 +/- 5.0	1.65 +/- 0.05	8
RMB	-43.7734	-72.9548	46.1	48.1	1.72	44.4 +/- 7.1	1.73 +/- 0.02	3
RMG	-45.9068	-72.3212	388	34.7	1.85	36.6 +/- 3.9	1.82 +/- 0.08	9
RPR	-46.2217	-74.0101	45.6	29.2	1.8	33.9 +/- 5.7	1.83 +/- 0.03	12
RRS	-47.4767	-72.5414	45.6	37.7	1.7	34.8 +/- 4.6	1.75 +/- 0.08	21
SAD	-46.7529	-74.4598	68.1	32.1	1.62	33.8 +/- 6.8	1.64 +/- 0.07	14
VCC	-46.1208	-72.1607	367.3	50.8	1.83	47.7 +/- 7.4	1.82 +/- 0.05	48
VMG	-45.1755	-72.1426	214.9	33.8	1.74	34.7 +/- 3.8	1.74 +/- 0.08	29
VOH	-48.4679	-72.5615	302.4	38	1.62	36.7 +/- 4.9	1.67 +/- 0.09	18
YNG	-47.9326	-73.3285	81.3	37.9	1.61	34.8 +/- 4.6	1.69 +/- 0.08	16
ALE**	-45.8105	-74.1574	56.9					-
IML**	-45.2587	-73.8046	59.2					-
IVV**	-44.2725	-73.7824	60.8					-

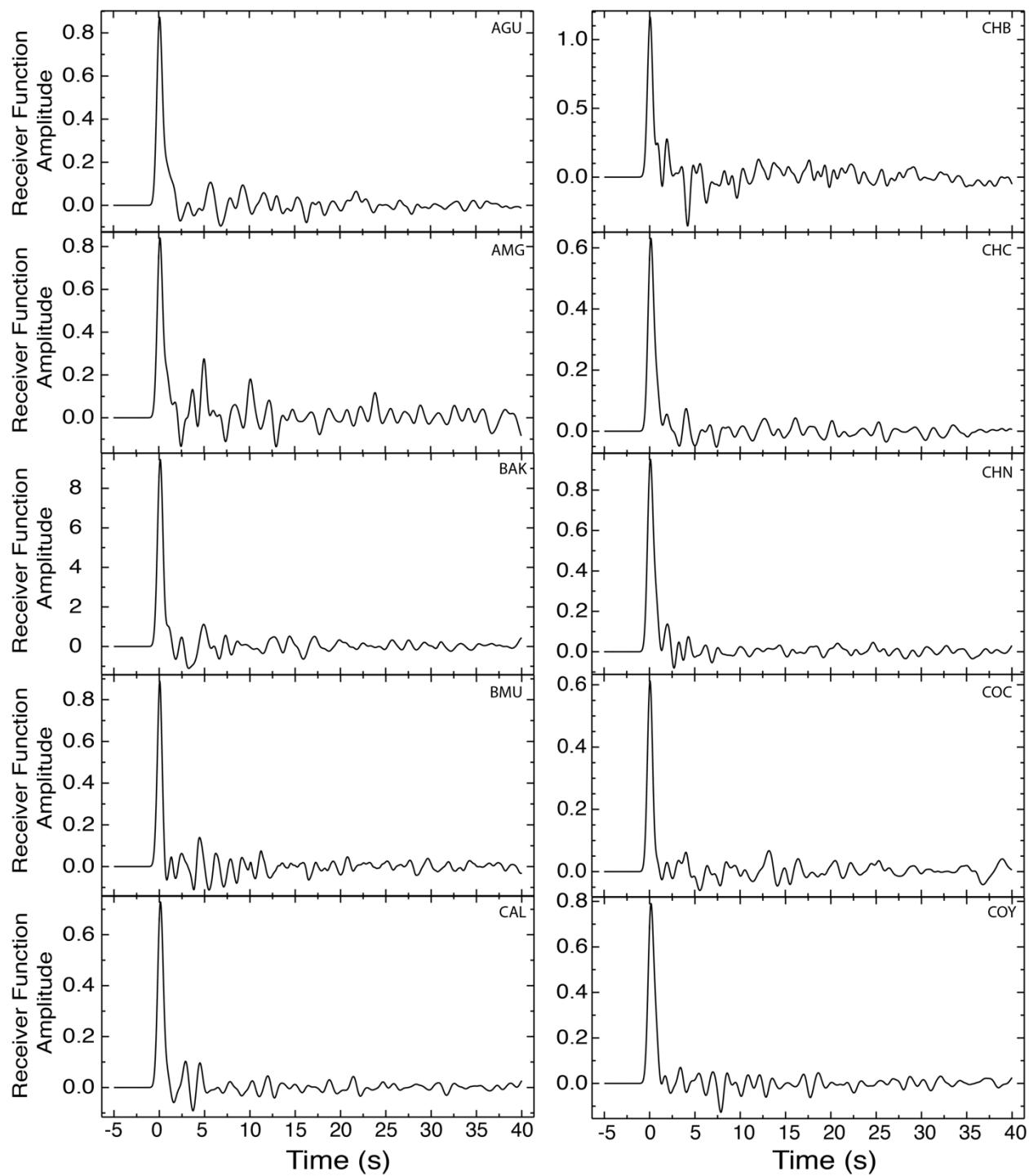
\*\*Short period stations

**Table S2.**  $H$ - $k$  and  $H$ - $k$  bootstrapping results for the SEARCH network (4 letter coded).

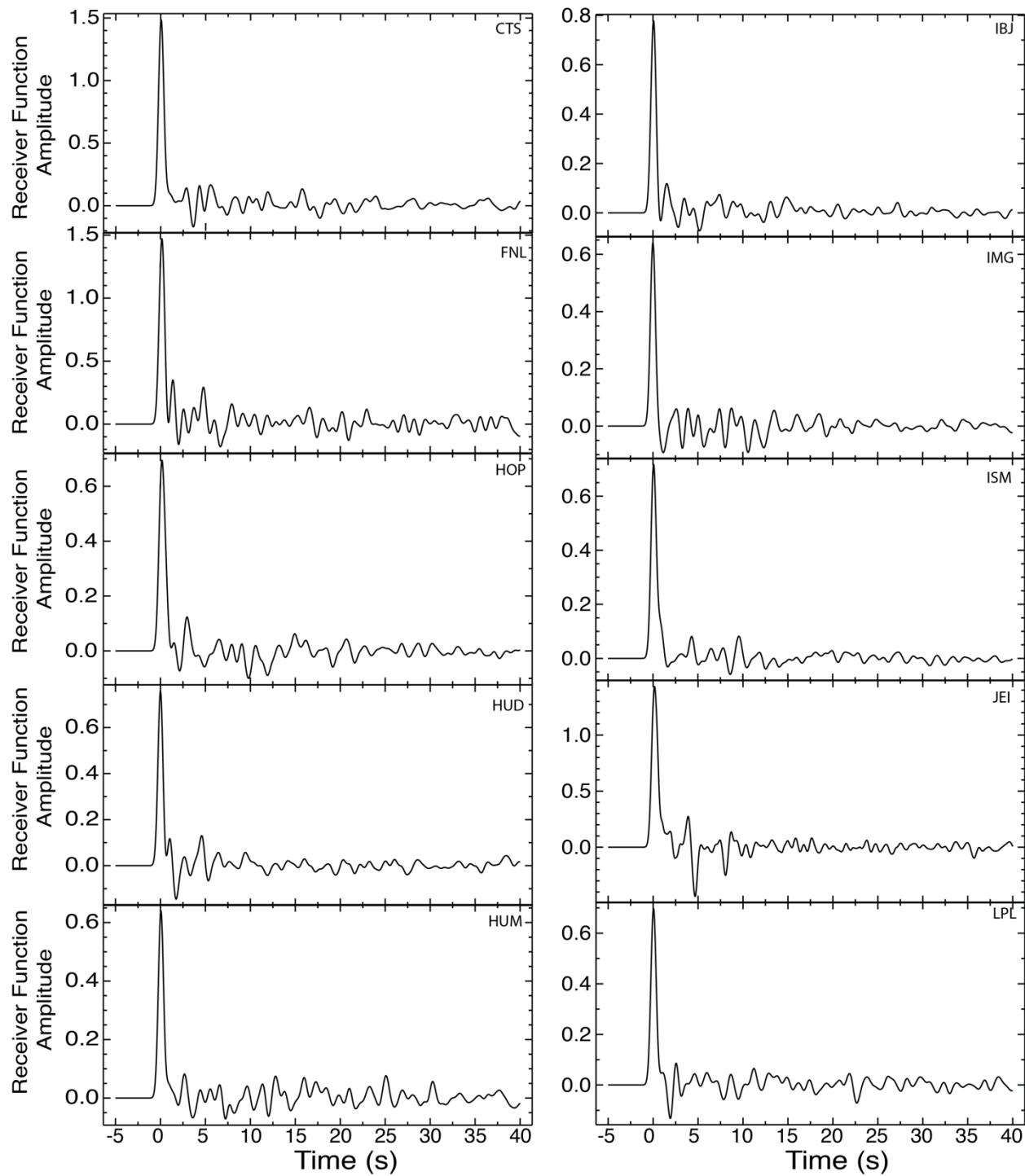
Station	Lat. (°)	Lon (°)	Elevation (m)	$H$ value (km)	$k$ value	Bootstrap $H$ value (km)	Bootstrap $k$ value	RFs
ALAC	-46.5063	-73.0630	293	33.11	1.64	37.7 +/- 4.8	1.66 +/- 0.08	3
BAEX	-46.3067	-73.5350	3	37.48	1.64	37.8 +/- 5.0	1.66 +/- 0.08	5
BARR	-45.7349	-72.2063	414	42.49	1.86	42.8 +/- 5.5	1.82 +/- 0.07	9
BERT	-47.0198	-72.8017	395	43.34	1.85	43.5 +/- 3.6	1.87 +/- 0.03	8
ELCO	-47.2538	-72.5314	321	33.87	1.76	35.3 +/- 4.6	1.75 +/- 0.09	19
ELSA	-46.6068	-72.7420	236	31.91	1.8	33.5 +/- 3.9	1.80 +/- 0.06	11
ENBA	-47.1348	-72.0542	516	33.68	1.79	35.5 +/- 5.8	1.79 +/- 0.08	7
JARA	-46.5173	-71.8459	230	42.49	1.64	43.3 +/- 4.3	1.65 +/- 0.05	7
JOSE	-46.7472	-72.5432	328	46.92	1.63	44.5 +/- 4.5	1.63 +/- 0.08	27
JOVI	-46.5009	-72.7216	268	32.41	1.8	36.6 +/- 5.9	1.75 +/- 0.10	16
LAJE	-46.8438	-71.9977	868	38.73	1.6	37.8 +/- 5.9	1.65 +/- 0.09	7
LAMO	-45.8595	-72.0510	640	31.53	1.79	34.8 +/- 5.6	1.76 +/- 0.08	24
LAOH	-48.5170	-72.5967	252	39.79	1.93	40.2 +/- 1.5	1.90 +/- 0.07	5
LAPO	-45.702702	-71.8333	833	33.9	1.84	35.6 +/- 5.4	1.83 +/- 0.08	23
LASN	-46.242352	-72.0869	549	49.02	1.67	49.1 +/- 2.6	1.66 +/- 0.05	10
LATR	-45.667831	-72.4130	292	35.29	1.8	37.1 +/- 4.0	1.79 +/- 0.03	10
LAVA	-47.700401	-73.1443	42	31.37	1.86	34.6 +/- 6.0	1.81 +/- 0.09	17
LEVI	-46.34782	-71.9336	478	34.88	1.79	38.5 +/- 4.2	1.73 +/- 0.06	16
LNEG	-46.57732	-72.6423	157	32.65	1.79	33.5 +/- 4.5	1.80 +/- 0.07	6
LUNA	-45.882919	-72.3299	292	49.2	1.87	46.9 +/- 4.5	1.87 +/- 0.05	4
MANE	-45.383831	-71.9854	609	38.29	1.77	37.3 +/- 5.2	1.77 +/- 0.07	21
MANS	-46.14542	-72.3880	358	39.55	1.88	40.0 +/- 4.9	1.80 +/- 0.10	14
MART	-46.836948	-72.8004	216	34.94	1.82	36.0 +/- 5.1	1.75 +/- 0.08	11
MAYE	-48.26313	-72.4265	404	33.11	1.8	33.6 +/- 4.2	1.80 +/- 0.07	15
MILI	-47.174919	-71.8883	613	27.21	1.56	27.7 +/- 6.4	1.62 +/- 0.10	11
ODGE	-46.147419	-73.7149	3	46.08	1.92	54.2 +/- 3.5	1.78 +/- 0.06	5
PALA	-46.295719	-71.8321	425	44.41	1.61	42.0 +/- 4.3	1.66 +/- 0.08	12
PCEA	-45.67308	-72.2212	372	35.58	1.83	38.4 +/- 4.9	1.83 +/- 0.05	29

PENI	-47.237572	-72.3300	186	34.05	1.77	35.2 +/- 3.2	1.78 +/- 0.06	37
PUAG	-45.167221	-73.5133	3	29.82	1.55	29.2 +/- 2.0	1.58 +/- 0.04	8
PUCH	-45.450081	-72.7886	24	41.52	1.76	42.1 +/- 5.6	1.71 +/- 0.05	5
TORT	-47.7941	-73.5281	95	26.04	1.69	31.4 +/- 5.3	1.76 +/- 0.08	4
TRAI	-46.3282	-72.7708	352	40.16	1.82	42.0 +/- 4.6	1.83 +/- 0.06	6
TRES	-47.4062	-72.7119	405	30.01	1.9	33.7 +/- 5.2	1.82 +/- 0.11	13
VERD	-46.5573	-71.9521	465	33.06	1.86	36.7 +/- 6.2	1.82 +/- 0.10	4
VIVI	-45.3606	-72.4571	274	29.35	1.64	34.4 +/- 7.1	1.69 +/- 0.08	11
QUIT**	-45.6527	-73.2017	3					-
RIMA**	-45.3111	-72.3269	629					-

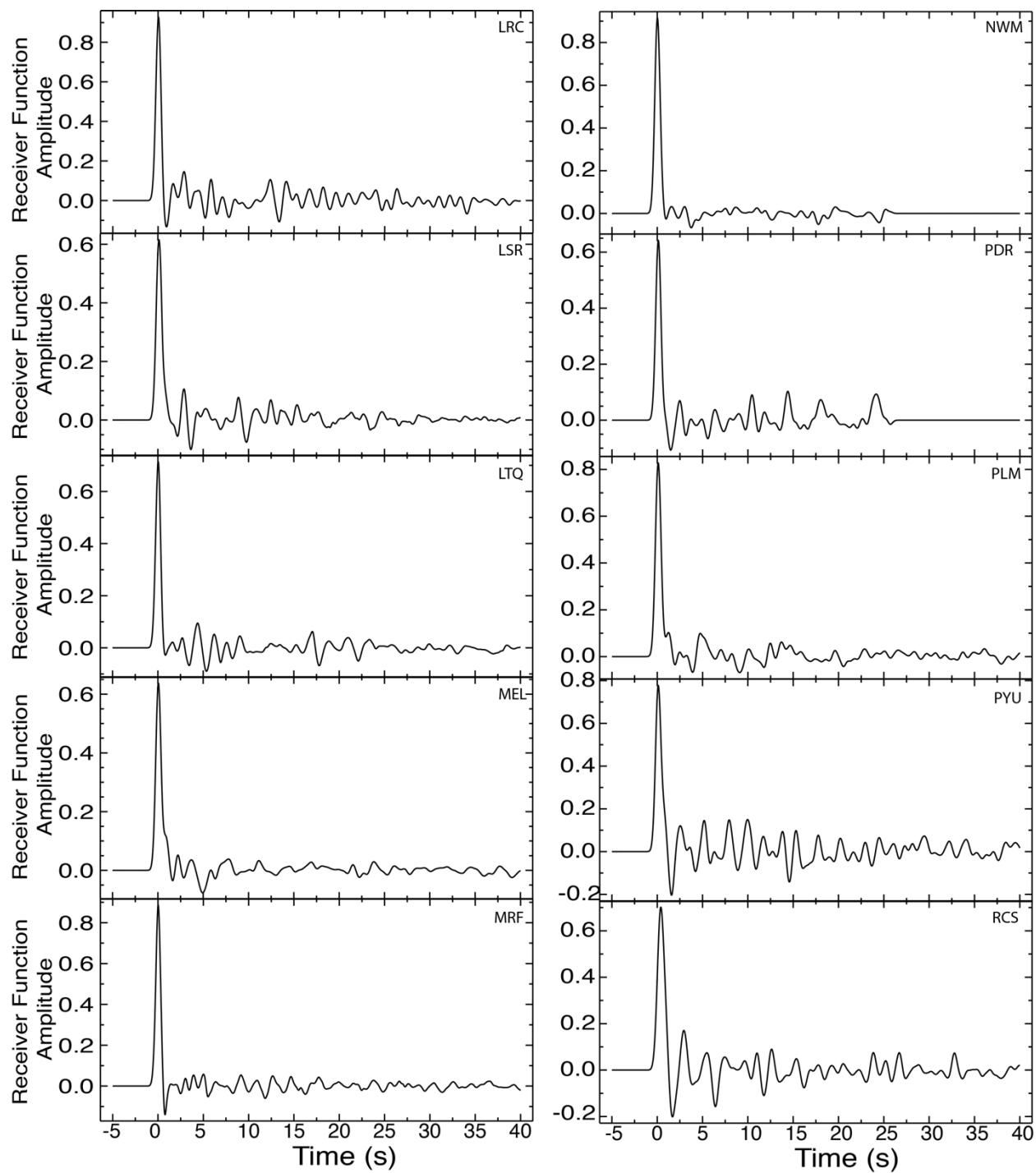
\*\* Noisy Stations



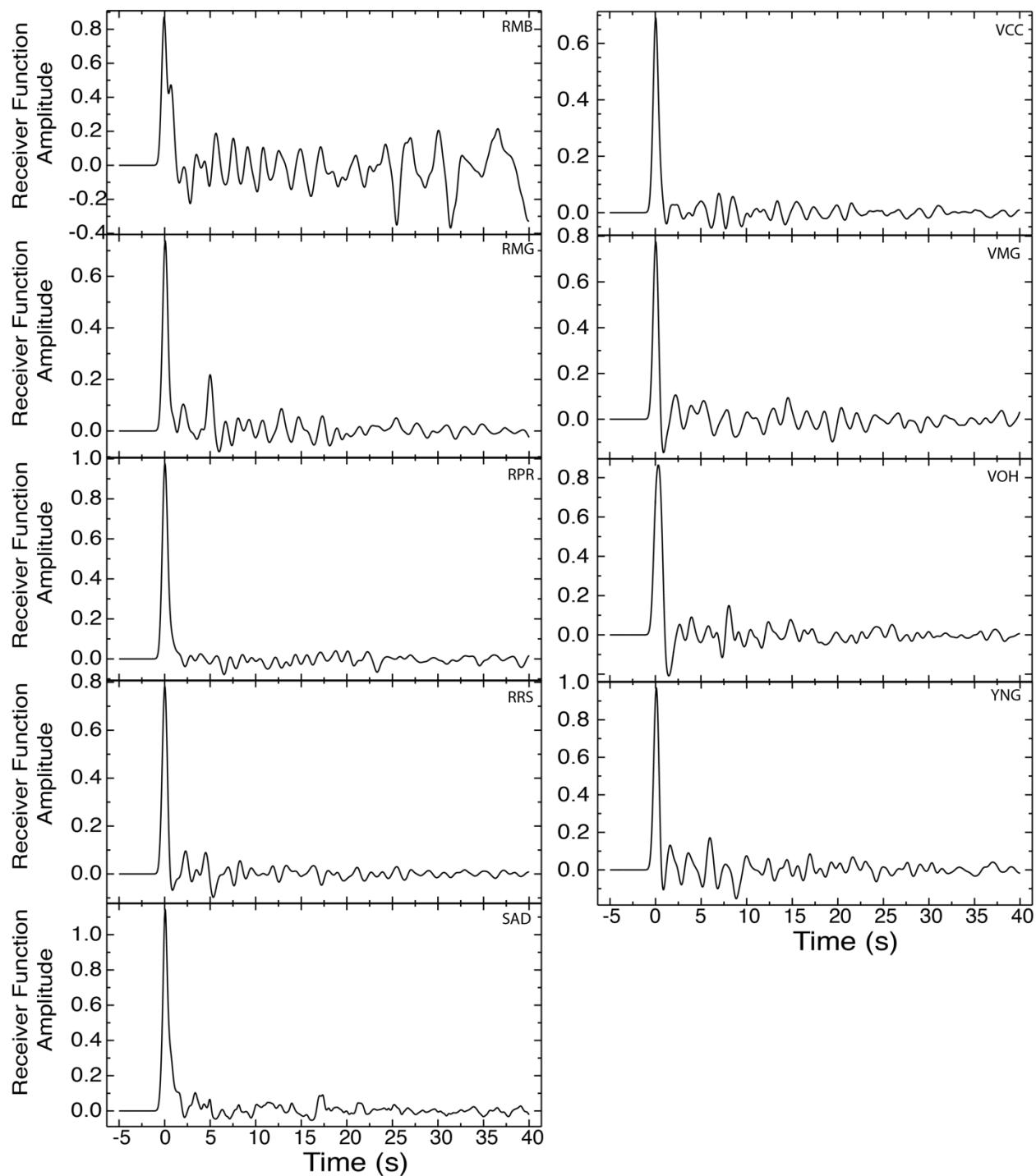
**Figure S1.** Receiver functions stacks of the CRSP network (Stations AGU - COY). Stations are denoted in right upper corner. The stacks include normal move-out corrections where stations were stacked by their P-arrival time.



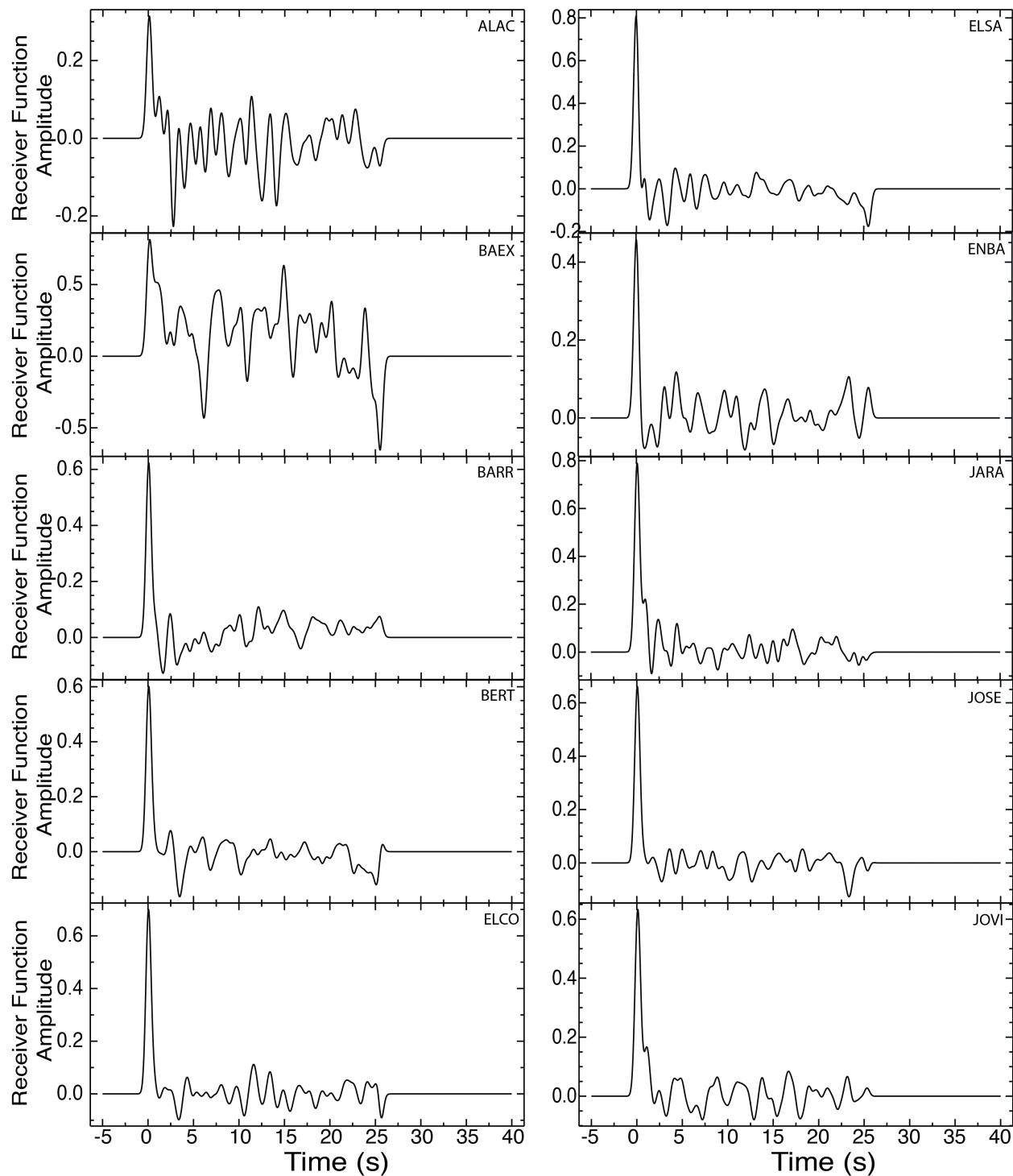
**Figure S2.** Receiver function stacks of the CRSP network (Stations CTS - LPL). Stations are denoted in right upper corner.



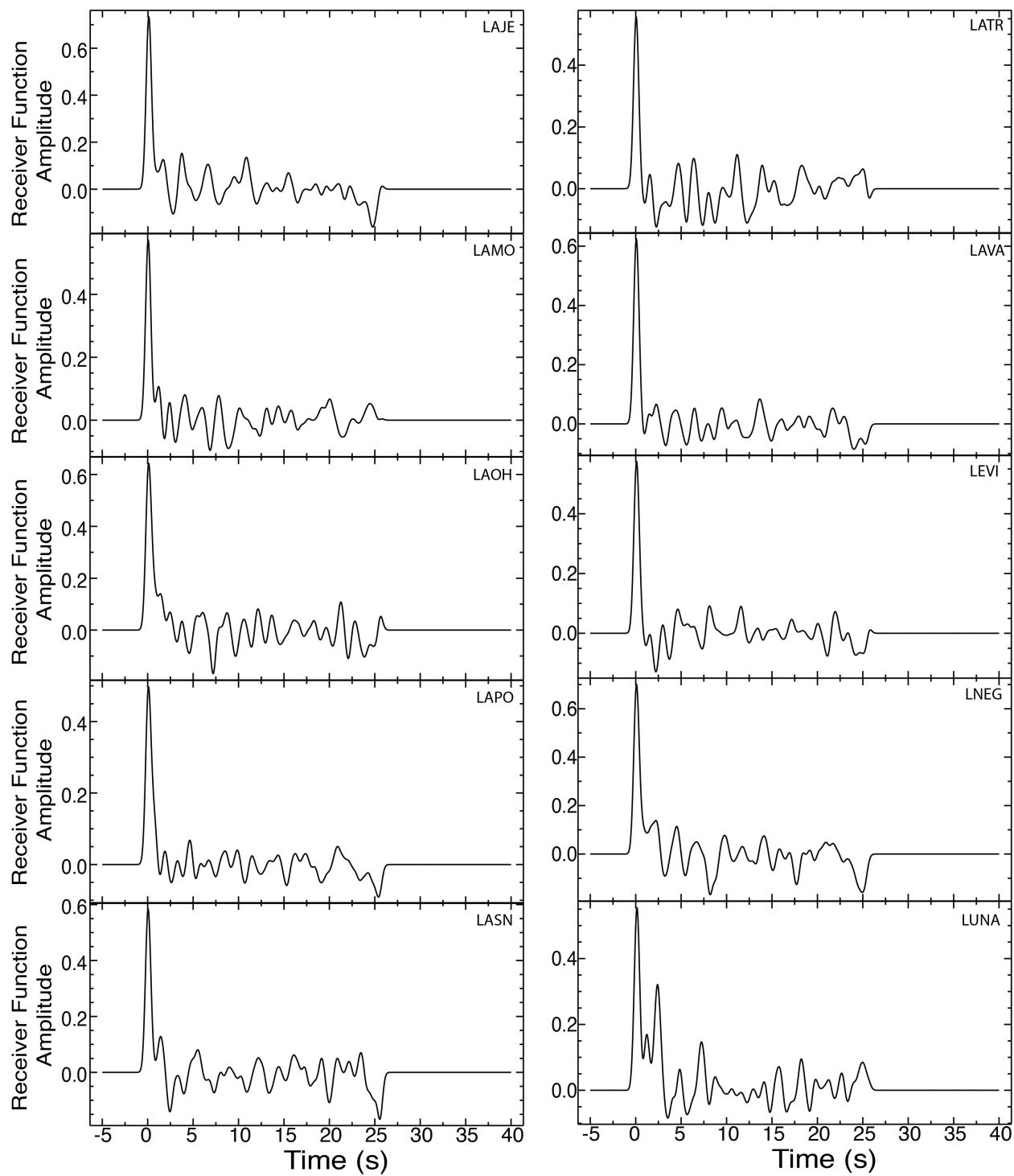
**Figure S3.** Receiver function stacks of the CRSP network (Stations LRC - RCS). Stations are denoted in right upper corner.



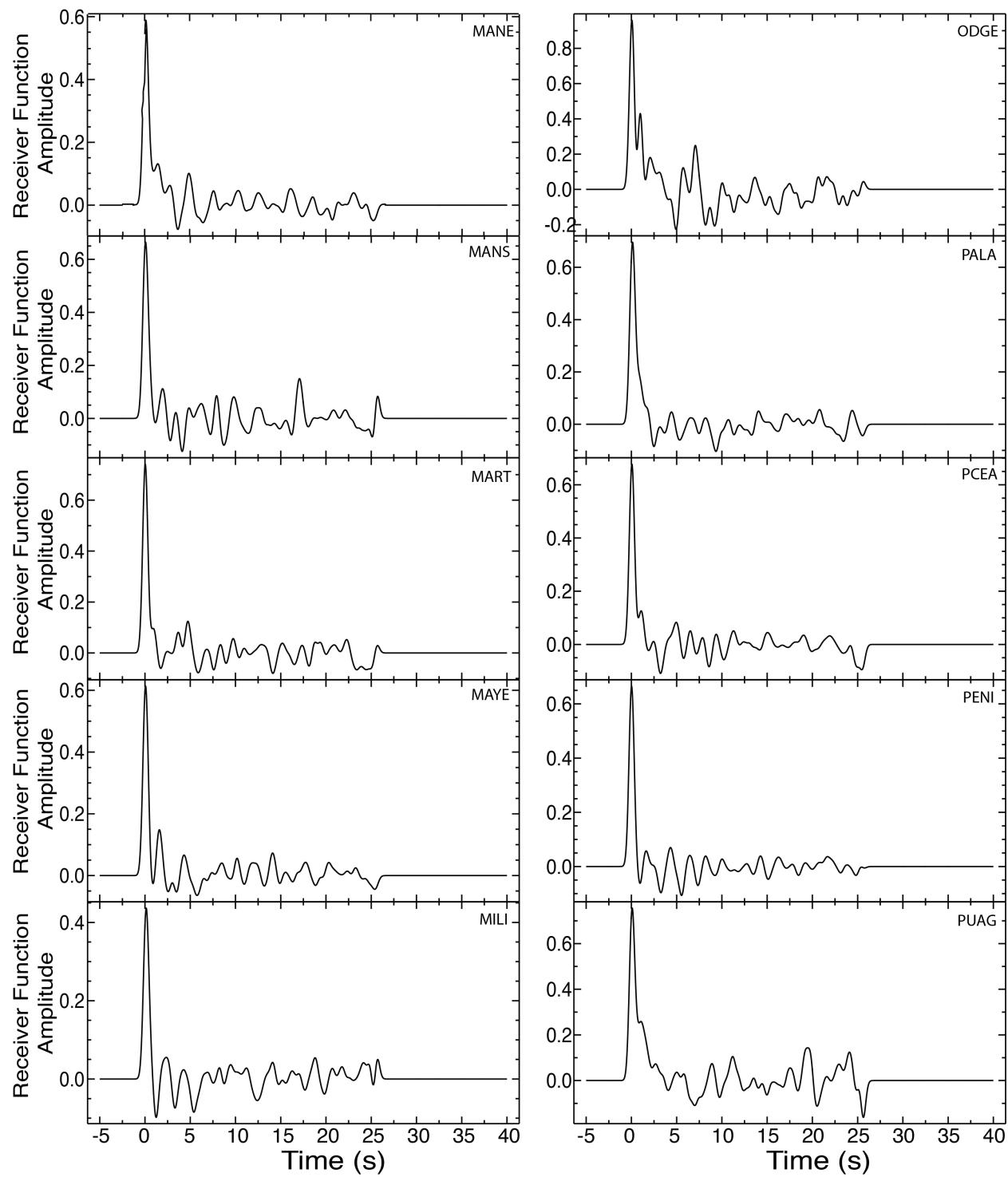
**Figure S4.** Receiver function stacks of the CRSP network (Stations RMB - YNG). Stations are denoted in right upper corner.



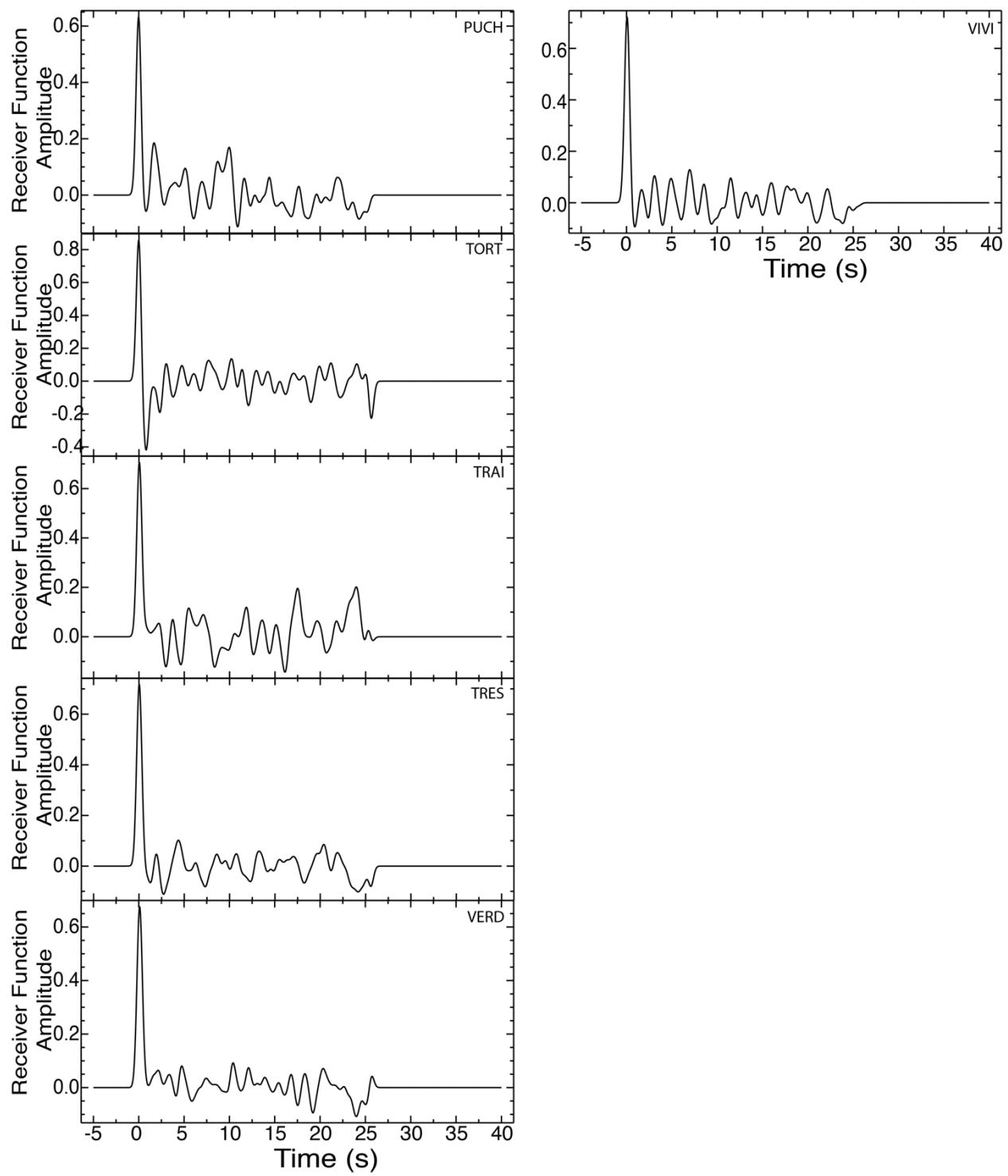
**Figure S5.** Receiver function stacks of the SEARCH network (Stations ALAC - JOVI). Stations are denoted in right upper corner.



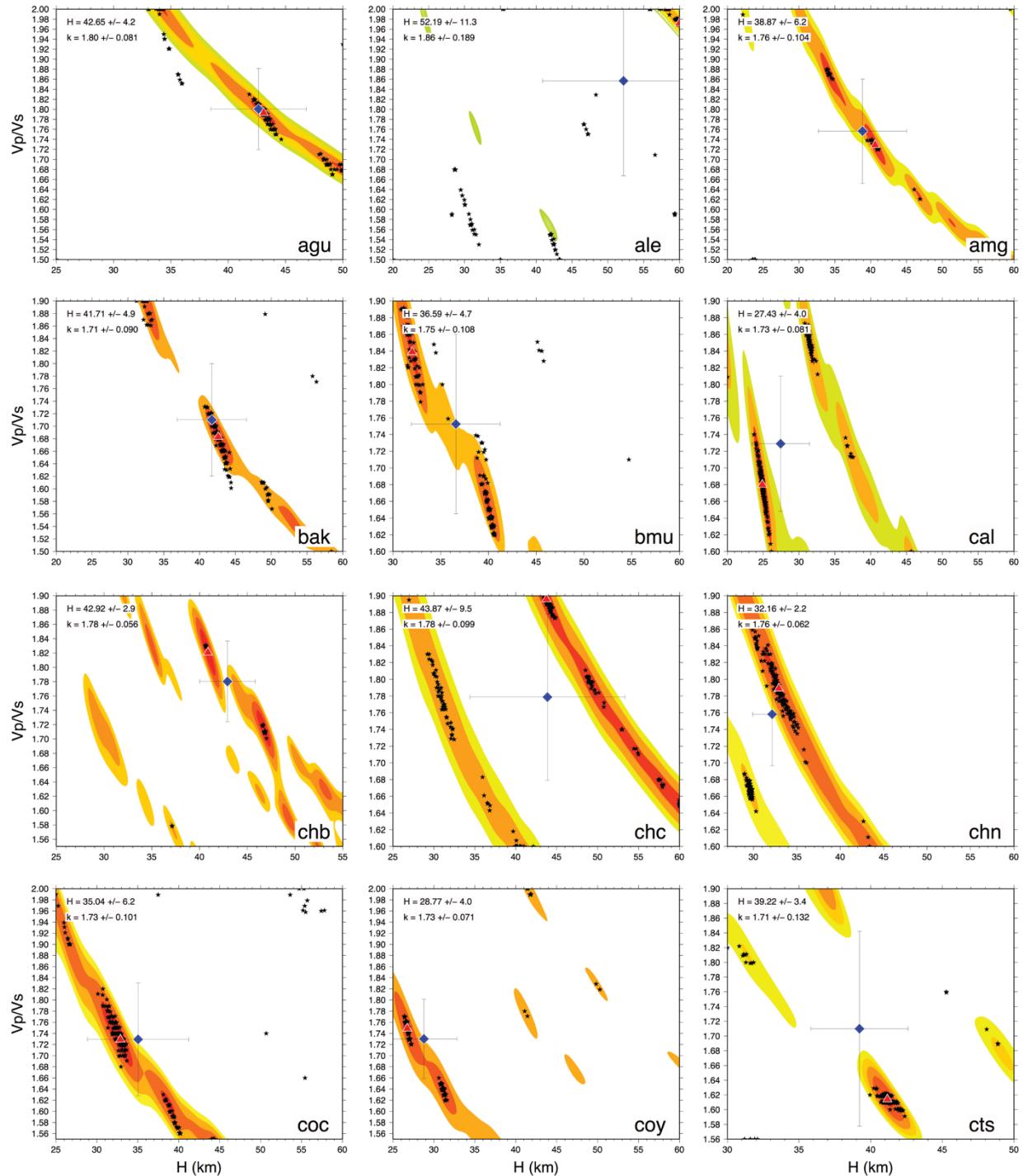
**Figure S6.** Receiver function stacks of the SEARCH network (Stations LAJE - LUNA). Stations are denoted in right upper corner.



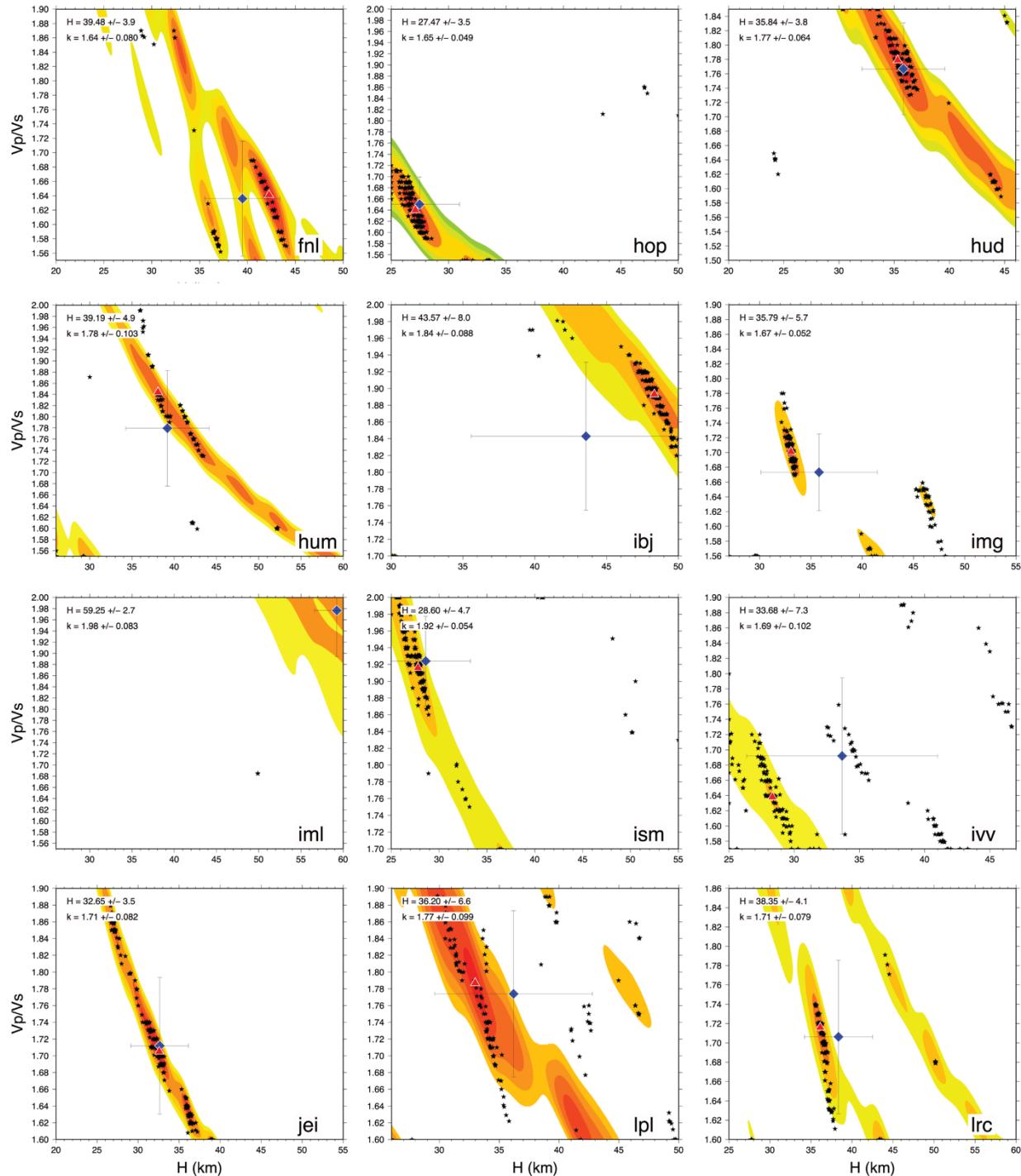
**Figure S7.** Receiver function stacks of the SEARCH network (Stations MANE - PUAG). Stations are denoted in right upper corner.



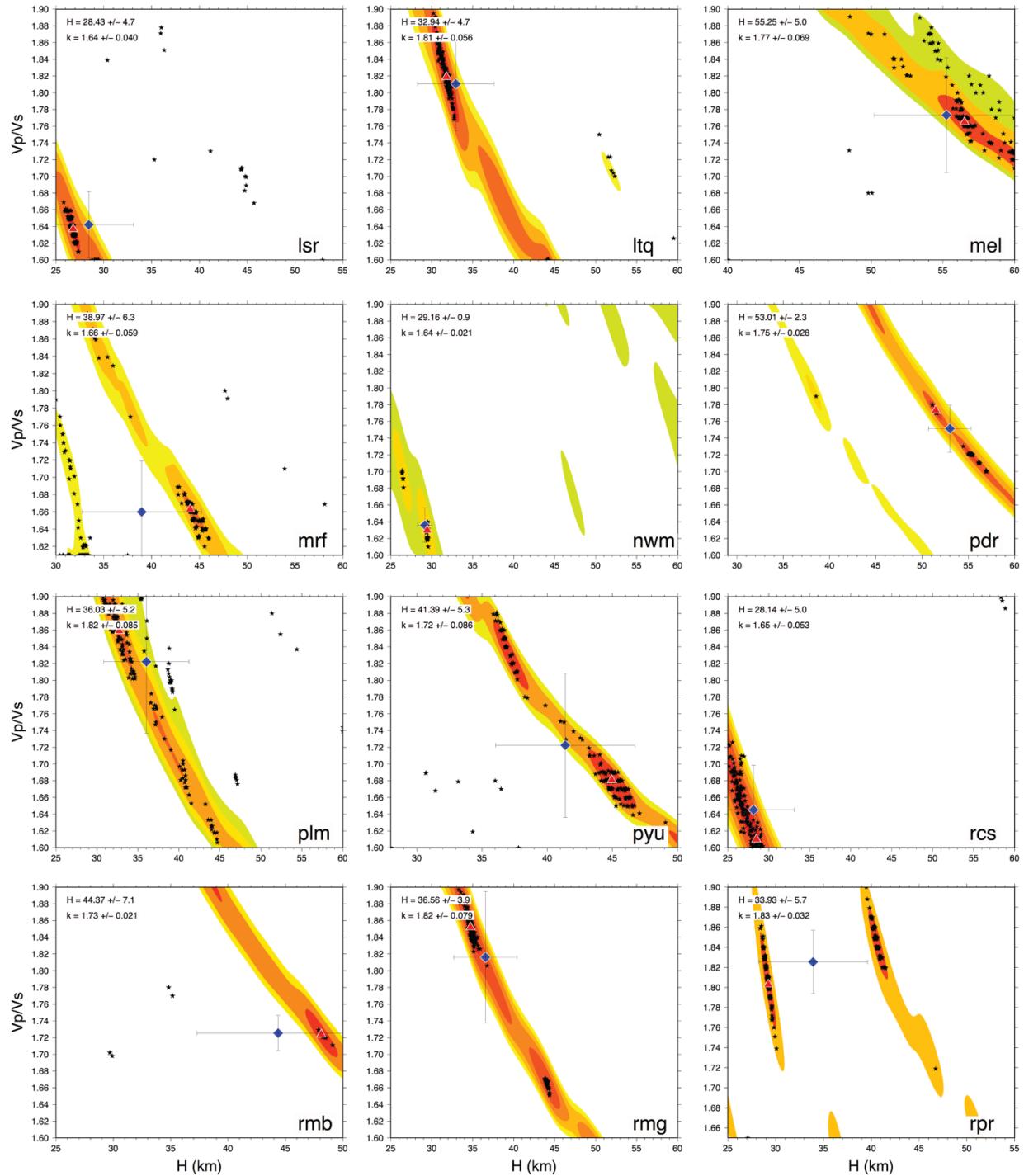
**Figure S8.** Receiver function stacks of the SEARCH network (Stations PUCH - VIVI). Stations are denoted in right upper corner.



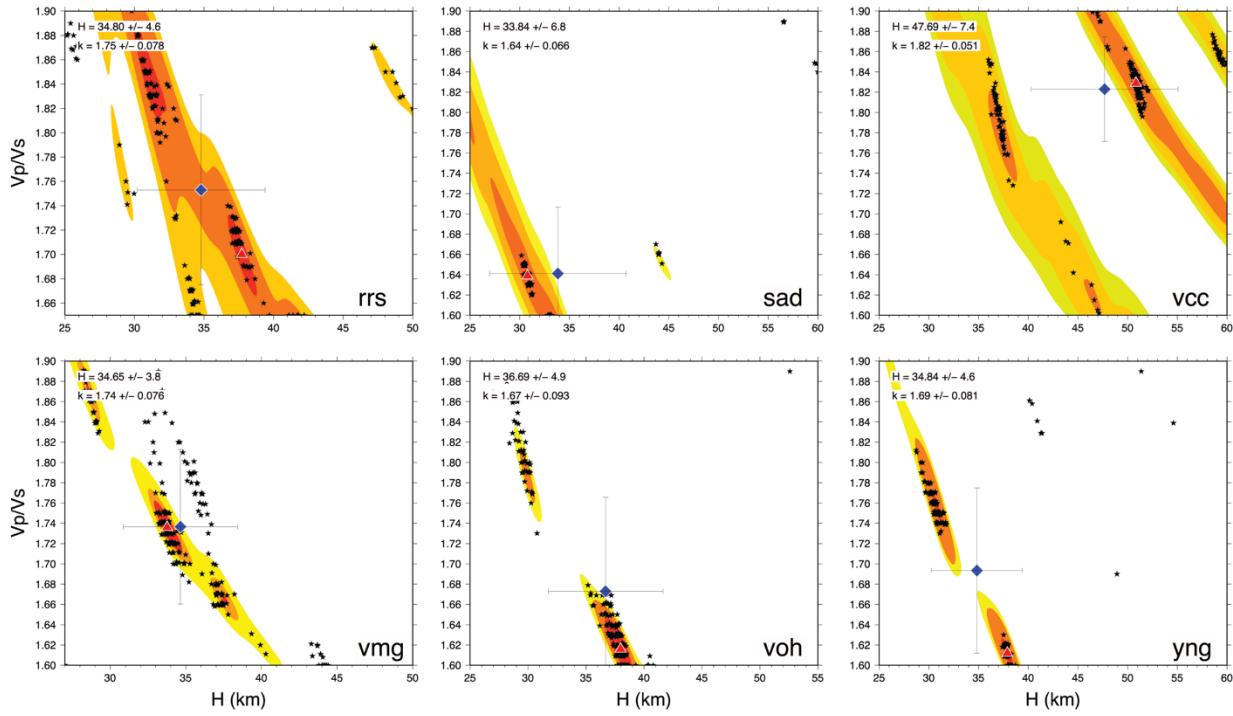
**Figure S9.**  $H$ - $k$  Stacking Results (Stations AGU – CTS).  $H$ - $k$  grid search (red triangle) and bootstrapping results (blue diamond with associated error bars) of the CRSP network stations AGU – CTS. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure. The black stars show the grid search result of each bootstrap run.



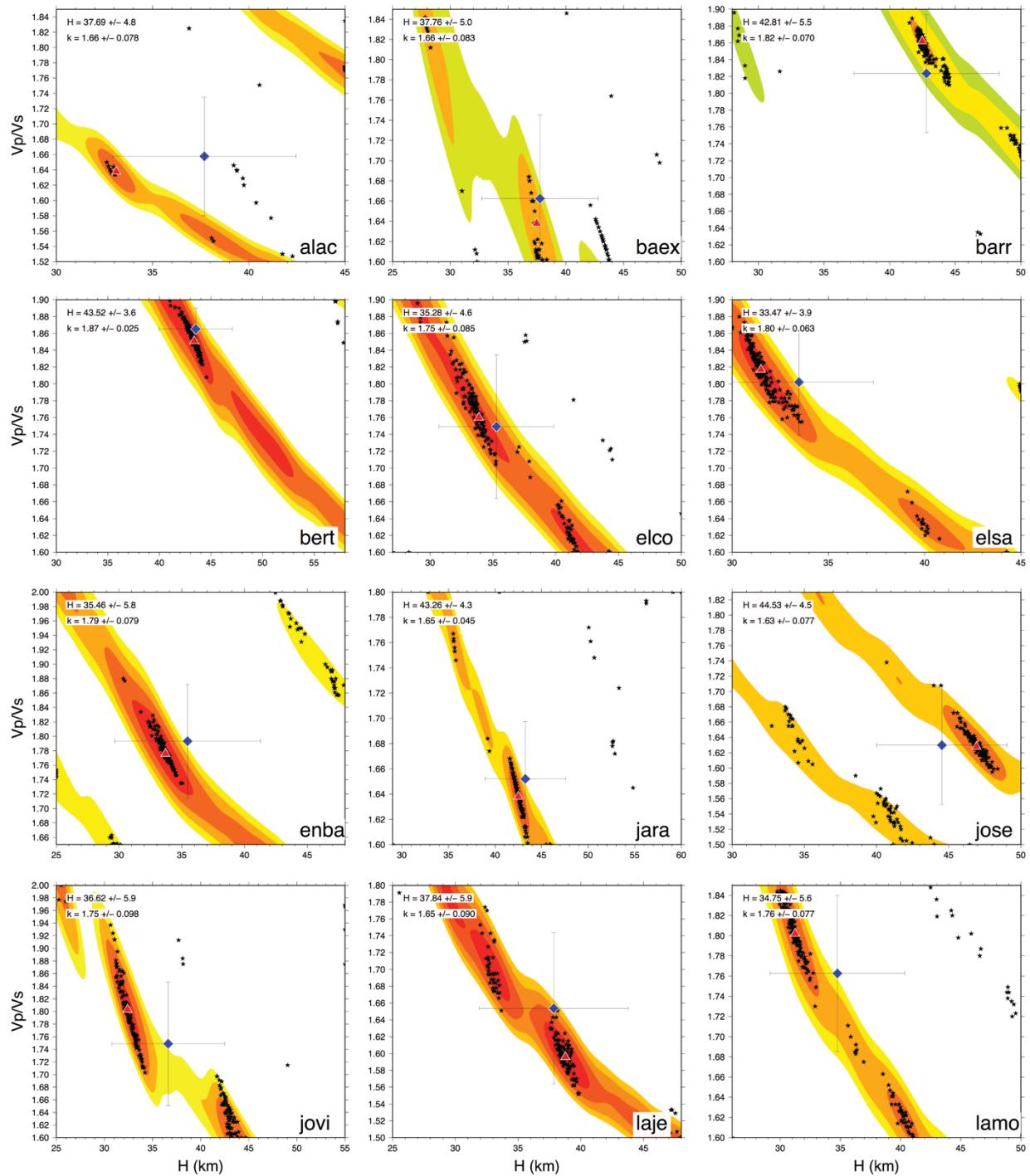
**Figure S10.**  $H$ - $k$  Stacking Results (Stations FNL – LRC).  $H$ - $k$  grid search and bootstrapping results of the CRSP network stations FNL – LRC. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.



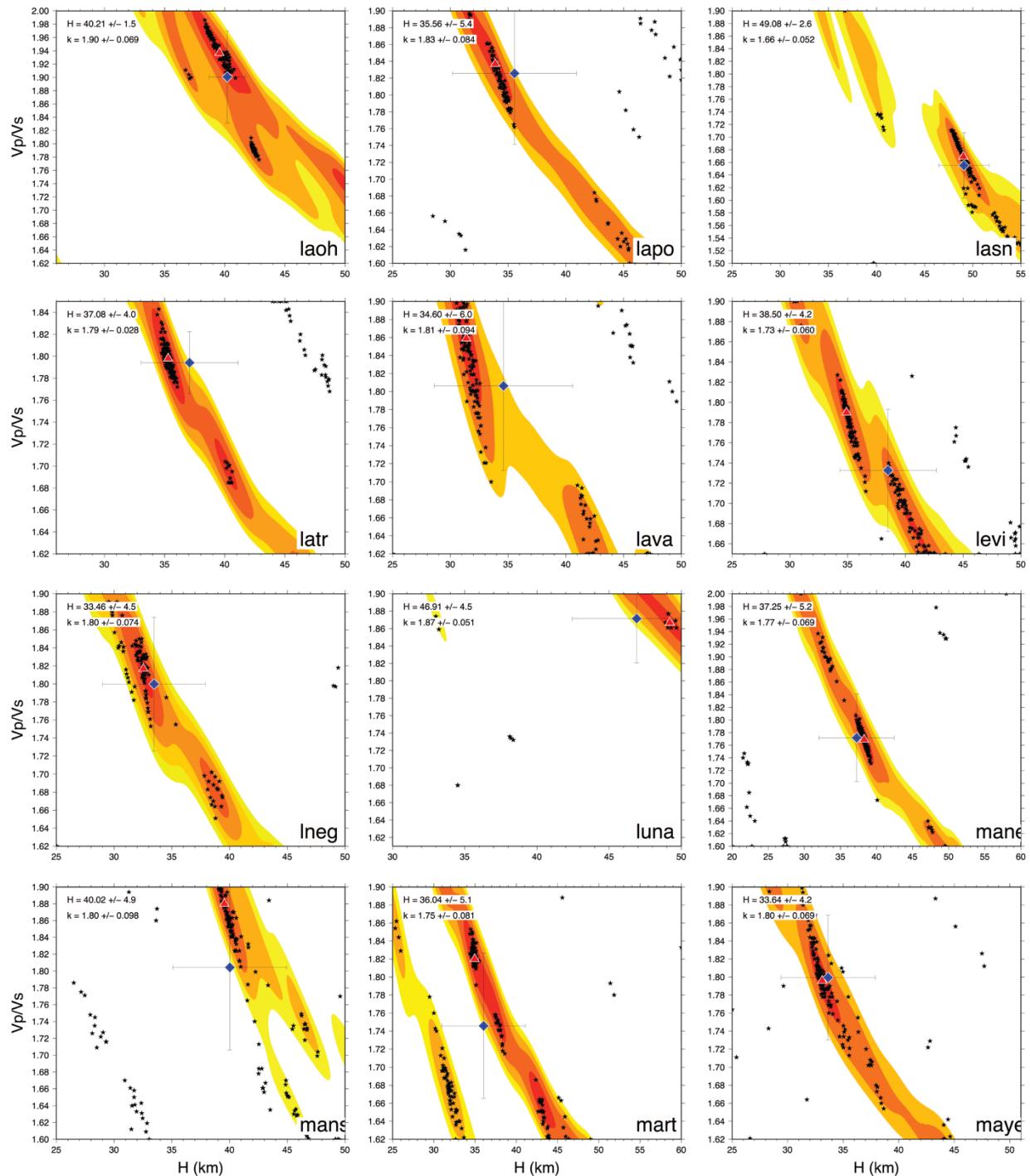
**Figure S11.**  $H$ - $k$  Stacking Results (Stations LSR - RPR).  $H$ - $k$  grid search and bootstrapping results of the CRSP network continued stations LSR - RPR. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.



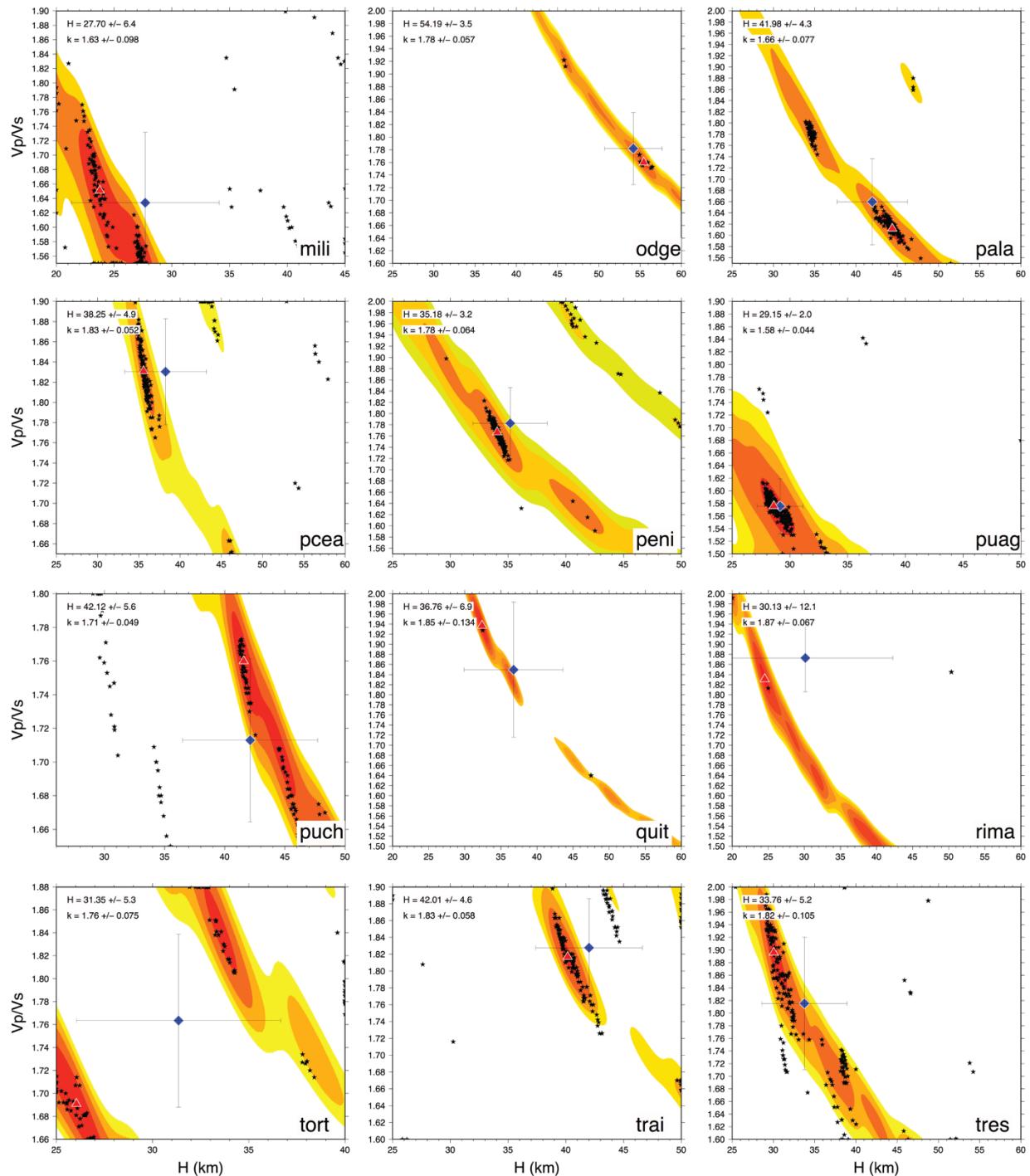
**Figure S12.**  $H$ - $k$  Stacking Results (Stations RRS - YNG).  $H$ - $k$  grid search and bootstrapping results of the CRSP network stations RRS – YNG. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.



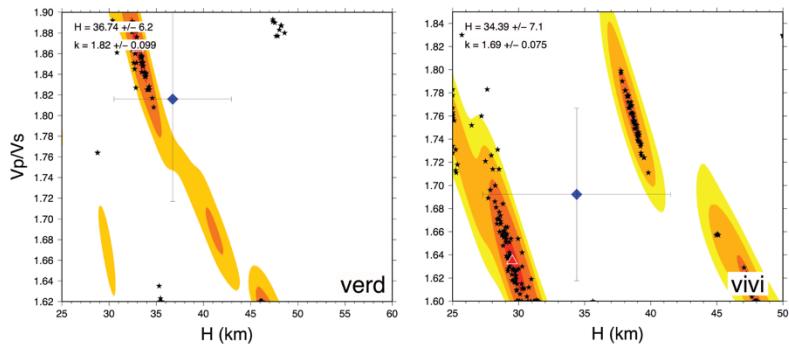
**Figure S13.**  $H$ - $k$  Stacking Results (Stations ALAC – LAMO).  $H$ - $k$  grid search and bootstrapping results of the SEARCH network stations ALAC - LAMO. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.



**Figure S14.**  $H$ - $k$  Stacking Results (Stations LAOH - MAYE).  $H$ - $k$  grid search and bootstrapping results of the SEARCH network stations LAOH - MAYE. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.



**Figure S15.**  $H$ - $k$  Stacking Results (Stations MILI - TRES).  $H$ - $k$  grid search and bootstrapping results of the SEARCH network stations MILI - TRES. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.



**Figure S16.**  $H$ - $k$  Stacking Results (Stations VERD - VIVI).  $H$ - $k$  grid search and bootstrapping results of the SEARCH network stations VERD - VIVI. Corresponding stations are denoted in the lower right and bootstrapping result in upper left of each figure.