



Supplement of

Mantle deformation patterns beneath the Central India Tectonic Zone: evidence from SK(K)S splitting measurements in the Satpura Gondwana Basin and adjacent areas

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Table S1: Detailed information of all high-quality individual SK(K)S-derived splitting parameters from Transverse Energy Minimization method, including the earthquake event (event date, origin time, latitude, longitude, and depth), seismic station (station name, latitude, and longitude), obtained shear wave splitting parameters along with their associated errors (FPD, FPD_err, δt , and δt_{err}) and seismic phase type.

Ev. Date	Origin Time	Ev. Lat (°)	Ev. Lon (°)	Depth (km)	Station	St. Lat (°)	St. Lon (°)	FPD (°)	FPD_err (°)	δt (s)	δt_{err} (s)	Phase
23.01.2024	14:33:45	-18.0	168.0	31	SG01	22.71	78.24	57.84	8.30	0.86	0.05	SKS
18.02.2024	07:29:20	-16.1	-174.6	220	SG01	22.71	78.24	-43.83	6.27	2.16	0.60	SKS
04.01.2024	04:56:38	-21.1	-176.5	197	SG01	22.71	78.24	-41.71	3.10	1.54	0.10	SKS
07.12.2023	12:56:31	-20.6	169.3	54	SG01	22.71	78.24	68.00	19.45	0.65	0.25	SKS
29.10.2023	04:32:08	-19.4	168.8	72	SG01	22.71	78.24	55.04	24.22	0.58	0.25	SKS
28.09.2023	14:40:26	-15.6	167.7	125	SG01	22.71	78.24	63.53	8.36	0.84	0.05	SKS
21.09.2023	21:11:49	-14.0	167.2	185	SG01	22.71	78.24	42.69	25.02	0.71	0.30	SKS
16.08.2023	12:47:40	-13.9	167.2	188	SG01	22.71	78.24	61.61	20.18	0.90	0.20	SKS
24.07.2023	02:49:58	-24.1	178.8	546	SG01	22.71	78.24	42.75	6.28	1.95	0.55	SKS
24.07.2023	02:49:58	-24.1	178.8	546	SG02	22.50	78.46	60.69	19.48	0.52	0.20	SKS
25.07.2023	10:35:18	17.1	145.5	378	SG02	22.50	78.46	54.42	23.78	0.55	0.25	SKS
26.07.2023	12:44:36	-14.7	167.9	13	SG02	22.50	78.46	53.57	24.84	0.56	0.10	SKS
28.09.2023	14:40:26	-15.6	167.7	125	SG02	22.50	78.46	49.77	10.32	0.64	0.15	SKS
29.10.2023	04:32:08	-19.4	168.8	72	SG02	22.50	78.46	54.32	10.74	0.42	0.15	SKS
11.11.2023	12:35:30	-17.9	168.1	23	SG02	22.50	78.46	46.51	18.45	0.92	0.40	SKS
22.11.2023	04:47:32	-15.0	168.0	13	SG02	22.50	78.46	58.71	20.36	0.44	0.20	SKS
07.12.2023	12:56:31	-20.6	169.3	54	SG02	22.50	78.46	59.55	18.44	0.55	0.15	SKS
11.12.2023	06:33:31	-18.7	-175.5	238	SG02	22.50	78.46	54.63	17.46	0.40	0.15	SKS
17.12.2023	07:37:58	-21.5	169.2	10	SG02	22.50	78.46	61.38	13.45	0.59	0.19	SKS
24.12.2023	02:00:32	-20.4	169.1	10	SG02	22.50	78.46	23.22	12.02	1.76	0.55	SKS
09.01.2024	07:53:20	-20.9	-173.6	10	SG02	22.50	78.46	51.32	23.30	0.34	0.10	SKS
23.01.2024	14:33:45	-18.0	168.0	31	SG02	22.50	78.46	53.05	12.56	0.72	0.15	SKS
24.07.2023	02:49:58	-24.1	178.8	546	SG03	22.27	78.72	71.20	19.08	0.64	0.30	SKS
16.08.2023	12:47:40	-13.9	167.2	188	SG03	22.27	78.72	84.30	16.42	1.02	0.35	SKS
21.09.2023	21:11:49	-14.0	167.2	185	SG03	22.27	78.72	71.35	10.05	0.83	0.20	SKS
28.09.2023	14:40:26	-15.6	167.7	125	SG03	22.27	78.72	78.76	8.68	1.14	0.15	SKS
29.10.2023	04:32:08	-19.4	168.8	72	SG03	22.27	78.72	83.14	12.08	0.87	0.30	SKS
11.11.2023	12:35:30	-17.9	168.1	23	SG03	22.27	78.72	76.66	13.74	0.87	0.25	SKS
07.12.2023	12:56:31	-20.6	169.3	54	SG03	22.27	78.72	73.68	9.05	0.97	0.20	SKS
11.12.2023	06:33:31	-18.7	-175.5	238	SG03	22.27	78.72	62.25	8.28	0.60	0.25	SKS
23.01.2024	14:33:45	-18.0	168.0	31	SG03	22.27	78.72	80.59	7.45	0.94	0.10	SKS
19.04.2024	09:18:01	-21.9	170.9	87	SG04	22.85	78.84	54.27	21.15	0.97	0.35	SKS
25.05.2024	22:23:16	-17.1	167.9	22	SG04	22.85	78.84	57.17	4.86	0.84	0.25	SKS
26.05.2024	20:47:11	-19.4	-174.9	127	SG04	22.85	78.84	35.82	5.45	0.92	0.35	SKS
04.07.2024	16:15:09	48.7	-129.0	10	SG04	22.85	78.84	44.95	13.05	0.76	0.25	SKS
22.07.2024	00:09:33	-19.2	169.6	242	SG04	22.85	78.84	-57.95	12.60	1.04	0.35	SKS
27.03.2024	01:28:21	-20.9	173.8	10	SG04	22.85	78.84	79.13	12.45	1.36	0.25	SKS
17.06.2024	14:09:44	-11.4	166.2	48	SG04	22.85	78.84	33.81	18.95	1.73	0.35	SKS
25.08.2024	23:29:08	-19.8	-175.1	96	SG04	22.85	78.84	38.12	2.05	0.53	0.10	SKS
05.04.2024	20:32:13	-18.1	-174.5	115	SG05	22.34	78.18	55.31	6.78	1.36	0.40	SKS
08.05.2024	08:17:19	-15.2	168.0	41	SG05	22.34	78.18	-32.59	7.33	0.20	0.05	SKS
03.06.2024	06:41:51	29.6	-42.8	10	SG05	22.34	78.18	52.63	18.46	1.21	0.35	SKS
11.07.2024	15:08:47	48.7	-128.7	10	SG05	22.34	78.18	68.61	6.82	1.70	0.45	SKS
13.07.2024	17:51:06	-27.7	-176.6	15	SG05	22.34	78.18	57.05	16.42	0.85	0.25	SKS
14.03.2024	21:10:25	29.8	-42.7	10	SG05	22.34	78.18	76.77	23.65	0.90	0.25	SKS
19.03.2024	02:25:31	-31.3	-179.1	9	SG05	22.34	78.18	54.29	5.05	1.27	0.25	SKS
27.03.2024	01:28:21	-20.9	173.8	10	SG05	22.34	78.18	72.38	18.55	1.43	0.30	SKS
17.06.2024	14:09:44	-11.4	166.2	48	SG05	22.34	78.18	57.01	22.32	0.68	0.15	SKS
22.07.2024	00:09:33	-19.2	169.6	242	SG05	22.34	78.18	58.53	21.56	0.74	0.15	SKS
25.08.2024	23:29:08	-19.8	-175.1	96	SG05	22.34	78.18	-39.58	7.02	1.10	0.30	SKS
19.04.2024	09:18:01	-21.9	170.9	87	SG06	22.53	77.65	74.56	21.16	0.82	0.35	SKS
05.05.2024	07:13:40	-19.3	-175.9	10	SG06	22.53	77.65	-50.67	9.28	1.12	0.30	SKS
08.05.2024	08:17:19	-15.2	168.0	41	SG06	22.53	77.65	45.66	14.05	0.34	0.10	SKS
25.05.2024	22:23:16	-17.1	167.9	22	SG06	22.53	77.65	26.73	22.56	0.44	0.15	SKS
03.06.2024	06:41:51	29.6	-42.8	10	SG06	22.53	77.65	49.73	18.92	0.84	0.35	SKS
04.06.2024	10:00:04	-17.9	-178.5	603	SG06	22.53	77.65	49.70	16.64	0.50	0.15	SKS
10.07.2024	04:55:42	-53.3	25.3	4	SG06	22.53	77.65	56.98	17.25	0.57	0.20	SKS
22.07.2024	00:09:33	-19.2	169.6	242	SG06	22.53	77.65	-8.58	21.45	1.30	0.10	SKS

Ev. Date	Origin Time	Ev. Lat (°)	Ev. Lon (°)	Depth (km)	Station	St. Lat (°)	St. Lon (°)	FPD (°)	FPD_err (°)	δt (s)	δt_{err} (s)	Phase
06.06.2024	22:58:45	-55.3	-29.2	35	SG06	22.53	77.65	-26.86	23.22	1.32	0.15	SKS
22.07.2024	00:09:33	-19.2	169.6	242	SG06	22.53	77.65	-47.64	17.65	0.65	0.25	SKS
15.12.2024	15:03:40	-18.7	-175.3	232	SG07	22.97	77.77	43.19	9.85	0.64	0.20	SKS
17.12.2024	01:47:26	-17.7	168.0	46	SG07	22.97	77.77	68.48	6.04	0.64	0.25	SKS
23.02.2025	18:16:18	-11.4	166.3	36	SG07	22.97	77.77	51.00	9.60	1.09	0.35	SKS
05.12.2024	18:44:21	40.4	-125.0	10	SG08	22.09	77.72	57.39	22.55	1.07	0.15	SKS
17.12.2024	01:47:26	-17.7	168.0	46	SG08	22.09	77.72	63.88	9.26	0.27	0.10	SKS
01.01.2025	13:48:25	-56.4	-26.7	76	SG08	22.09	77.72	73.81	16.55	2.47	0.35	SKS
05.01.2025	17:18:46	13.0	-89.2	46	SG08	22.09	77.72	77.00	11.94	2.09	0.35	SKS
20.01.2025	08:38:43	-11.3	165.9	36	SG08	22.09	77.72	50.79	6.46	0.51	0.25	SKS
02.05.2025	17:59:08	-57.3	-67.0	8	SG08	22.09	77.72	61.24	16.50	0.53	0.15	SKS
10.02.2025	00:09:43	-17.5	167.9	18	SG08	22.09	77.72	60.35	8.48	0.46	0.20	SKS
23.02.2025	18:16:18	-11.4	166.3	36	SG08	22.09	77.72	63.54	19.80	0.78	0.30	SKS
17.12.2024	01:47:26	-17.7	168.0	49	SG09	21.83	78.09	44.47	17.64	1.23	0.30	SKS
17.12.2024	01:53:13	-17.8	168.0	49	SG09	21.83	78.09	43.18	12.40	0.88	0.15	SKS
21.12.2024	15:30:53	-17.7	168.0	46	SG09	21.83	78.09	59.05	11.08	0.66	0.25	SKS
28.03.2025	00:34:22	0.7	-29.7	10	SG09	21.83	78.09	72.53	18.25	1.20	0.30	SKS
23.02.2025	18:16:18	-11.4	166.3	36	SG09	21.83	78.09	55.21	19.65	0.66	0.20	SKS
15.07.2025	09:55:02	-30.0	-178.0	45	SG09	21.83	78.09	59.04	16.32	0.81	0.25	SKS
10.11.2024	16:49:50	19.8	-77.1	14	SG09	21.83	78.09	8.85	16.75	0.73	0.26	SKS
02.05.2025	17:59:08	-57.3	-67.0	8	SG07	22.97	77.77	70.43	5.55	0.41	0.15	SKS
28.03.2025	00:34:22	0.7	-29.7	10	SG07	22.97	77.77	42.80	19.05	1.09	0.25	SKS
13.04.2025	20:03:23	-26.0	-178.3	271	SG07	22.97	77.77	72.77	5.15	0.38	0.07	SKS
30.03.2025	15:04:55	-20.4	-174.0	17	SG07	22.97	77.77	63.72	7.42	0.66	0.20	SKS
29.10.2023	04:32:08	-19.4	168.8	72	SG01	22.71	78.24	62.35	18.22	0.68	0.25	SKKS
23.12.2023	23:44:50	-20.4	-173.9	10	SG01	22.71	78.24	55.93	19.48	0.84	0.35	SKKS
20.01.2024	21:31:05	-7.3	-71.5	607	SG01	22.71	78.24	28.64	3.90	1.69	0.20	SKKS
16.08.2023	12:47:40	-13.9	167.2	188	SG01	22.71	78.24	60.77	20.25	0.79	0.25	SKKS
12.12.2023	12:54:05	-20.0	-173.4	10	SG02	22.50	78.46	61.35	15.67	1.10	0.25	SKKS
17.12.2023	07:37:58	-21.5	169.2	10	SG02	22.50	78.46	49.94	13.48	1.20	0.30	SKKS
20.12.2023	12:11:22	-15.9	-72.5	101	SG02	22.50	78.46	68.89	11.72	1.32	0.35	SKKS
23.12.2023	23:44:50	-20.4	-173.9	10	SG02	22.50	78.46	66.67	22.02	0.65	0.24	SKKS
20.01.2024	21:31:05	-7.3	-71.5	607	SG02	22.50	78.46	70.59	15.85	0.60	0.25	SKKS
23.01.2024	14:33:45	-18.0	168.0	31	SG02	22.50	78.46	73.74	14.92	0.88	0.20	SKKS
16.08.2023	12:47:40	-13.9	167.2	188	SG03	22.27	78.72	52.18	15.05	1.47	0.30	SKKS
11.12.2023	06:33:31	-18.7	-175.5	238	SG03	22.27	78.72	74.69	16.72	0.74	0.26	SKKS
20.01.2024	21:31:05	-7.3	-71.5	607	SG03	22.27	78.72	29.96	2.20	1.90	0.20	SKKS
23.01.2024	14:33:45	-18.0	168.0	31	SG03	22.27	78.72	79.03	11.65	1.15	0.25	SKKS
19.03.2024	02:25:31	-31.3	-179.1	9	SG04	22.85	78.84	-80.65	17.78	2.60	0.35	SKKS
30.04.2024	14:30:40	-55.7	-27.0	14	SG04	22.85	78.84	-44.94	23.06	2.68	0.35	SKKS
17.05.2024	20:58:27	-29.1	-178.5	196	SG04	22.85	78.84	52.43	7.18	0.83	0.25	SKKS
31.05.2024	15:54:42	-28.9	-176.9	20	SG04	22.85	78.84	63.69	5.45	2.03	0.30	SKKS
17.06.2024	14:09:44	-11.4	166.2	48	SG04	22.85	78.84	83.80	20.05	2.58	0.30	SKKS
15.07.2024	17:40:19	-16.4	-172.5	9	SG04	22.85	78.84	25.92	11.90	0.84	0.30	SKKS
19.07.2024	01:50:48	-23.1	-67.8	123	SG04	22.85	78.84	14.59	4.86	0.58	0.15	SKKS
25.08.2024	23:29:08	-19.8	-175.1	96	SG04	22.85	78.84	44.04	3.65	0.98	0.30	SKKS
19.04.2024	09:18:01	-21.9	170.9	87	SG05	22.34	78.18	66.15	13.18	1.48	0.20	SKKS
16.06.2024	14:47:33	-15.8	-74.4	23	SG05	22.34	78.18	31.25	24.02	2.02	0.25	SKKS
17.06.2024	14:09:44	-11.4	166.2	48	SG05	22.34	78.18	68.62	14.08	2.65	0.30	SKKS
12.07.2024	00:19:42	-4.6	-104.9	10	SG05	22.34	78.18	-43.26	19.45	1.71	0.25	SKKS
15.07.2024	17:40:19	-16.4	-172.5	9	SG05	22.34	78.18	52.09	1.86	1.06	0.35	SKKS
30.04.2024	14:30:40	-55.7	-27.0	14	SG05	22.34	78.18	49.31	17.55	1.84	0.25	SKKS
19.03.2024	02:25:31	-31.3	-179.1	9	SG05	22.34	78.18	56.91	23.68	0.78	0.25	SKKS
25.08.2024	23:29:08	-19.8	-175.1	96	SG05	22.34	78.18	60.66	9.18	1.23	0.30	SKKS
05.04.2024	20:32:13	-18.1	-174.5	115	SG06	22.53	77.65	-50.09	18.50	1.34	0.30	SKKS
12.05.2024	11:39:13	14.5	-92.4	58	SG06	22.53	77.65	7.93	3.75	0.77	0.30	SKKS
04.06.2024	10:00:04	-17.9	-178.5	603	SG06	22.53	77.65	43.37	20.24	1.29	0.20	SKKS
06.06.2024	22:58:45	-55.3	-29.2	35	SG06	22.53	77.65	77.10	22.40	1.58	0.25	SKKS
17.06.2024	14:09:44	-11.4	166.2	48	SG06	22.53	77.65	49.19	5.45	0.39	0.15	SKKS
09.08.2024	12:23:02	-30.4	-177.6	31	SG06	22.53	77.65	52.93	18.68	1.13	0.30	SKKS
28.03.2025	00:34:22	0.7	-29.7	10	SG07	22.97	77.77	42.56	19.45	1.09	0.27	SKKS
12.10.2024	17:43:45	10.5	-86.1	16	SG07	22.97	77.77	82.14	19.85	1.65	0.25	SKKS
02.05.2025	17:59:08	-57.3	-67.0	8	SG08	22.09	77.72	61.83	16.88	0.55	0.15	SKKS

Ev. Date	Origin Time	Ev. Lat (°)	Ev. Lon (°)	Depth (km)	Station	St. Lat (°)	St. Lon (°)	FPD (°)	FPD_err (°)	δt (s)	δt_{err} (s)	Phase
10.02.2025	00:09:43	-17.5	167.9	18	SG08	22.09	77.72	62.15	7.68	0.52	0.15	SKKS
23.02.2025	18:16:18	-11.4	166.3	36	SG08	22.09	77.72	62.78	19.25	0.75	0.35	SKKS
05.01.2025	17:18:46	13.0	-89.2	46	SG08	22.09	77.72	75.94	11.45	2.32	0.25	SKKS
17.12.2024	01:47:26	-17.7	168.0	49	SG09	21.83	78.09	45.48	17.55	1.51	0.30	SKKS
17.12.2024	01:53:13	-17.8	168.0	49	SG09	21.83	78.09	42.47	12.86	0.85	0.15	SKKS
21.12.2024	15:30:53	-17.7	168.0	46	SG09	21.83	78.09	59.68	11.07	0.80	0.25	SKKS
28.03.2025	00:34:22	0.7	-29.7	10	SG09	21.83	78.09	72.26	18.24	1.46	0.30	SKKS
23.02.2025	18:16:18	-11.4	166.3	36	SG09	21.83	78.09	54.28	19.72	0.80	0.30	SKKS

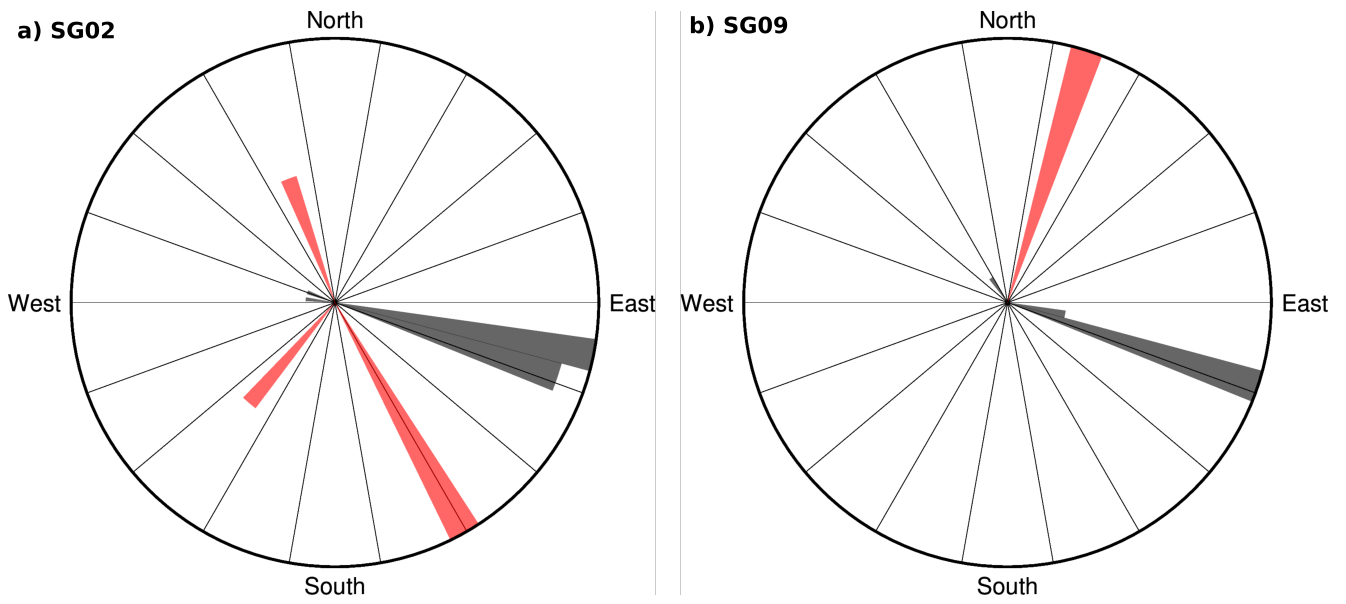


Figure S1: Rose diagram illustrating the backazimuthal coverage for the splits (depicted in black) and the nulls (shown in red) for the SG02 and SG09 seismic stations.

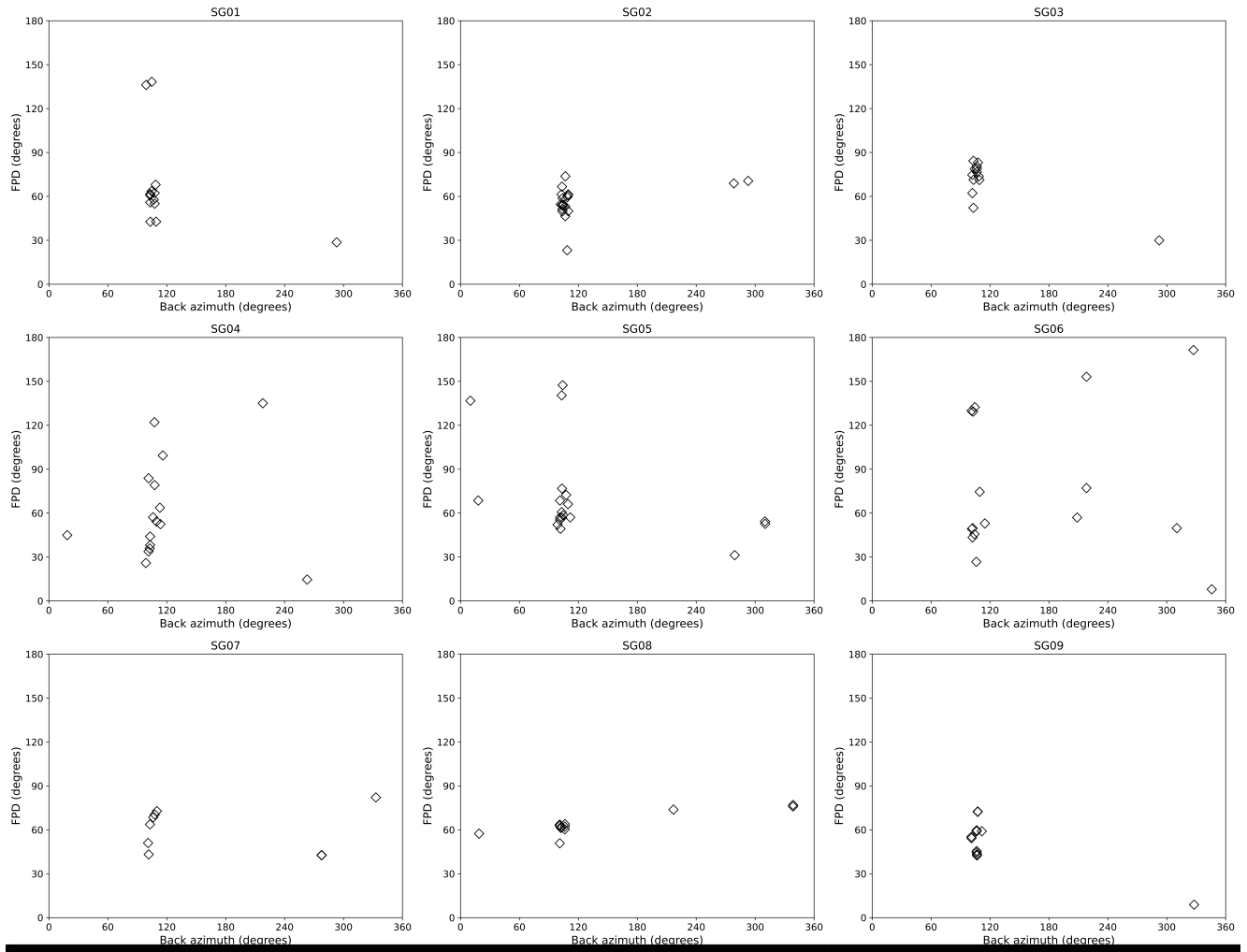


Figure S2: Backazimuthal variation of the individual fast polarization directions (FPDs) for all nine seismic stations.

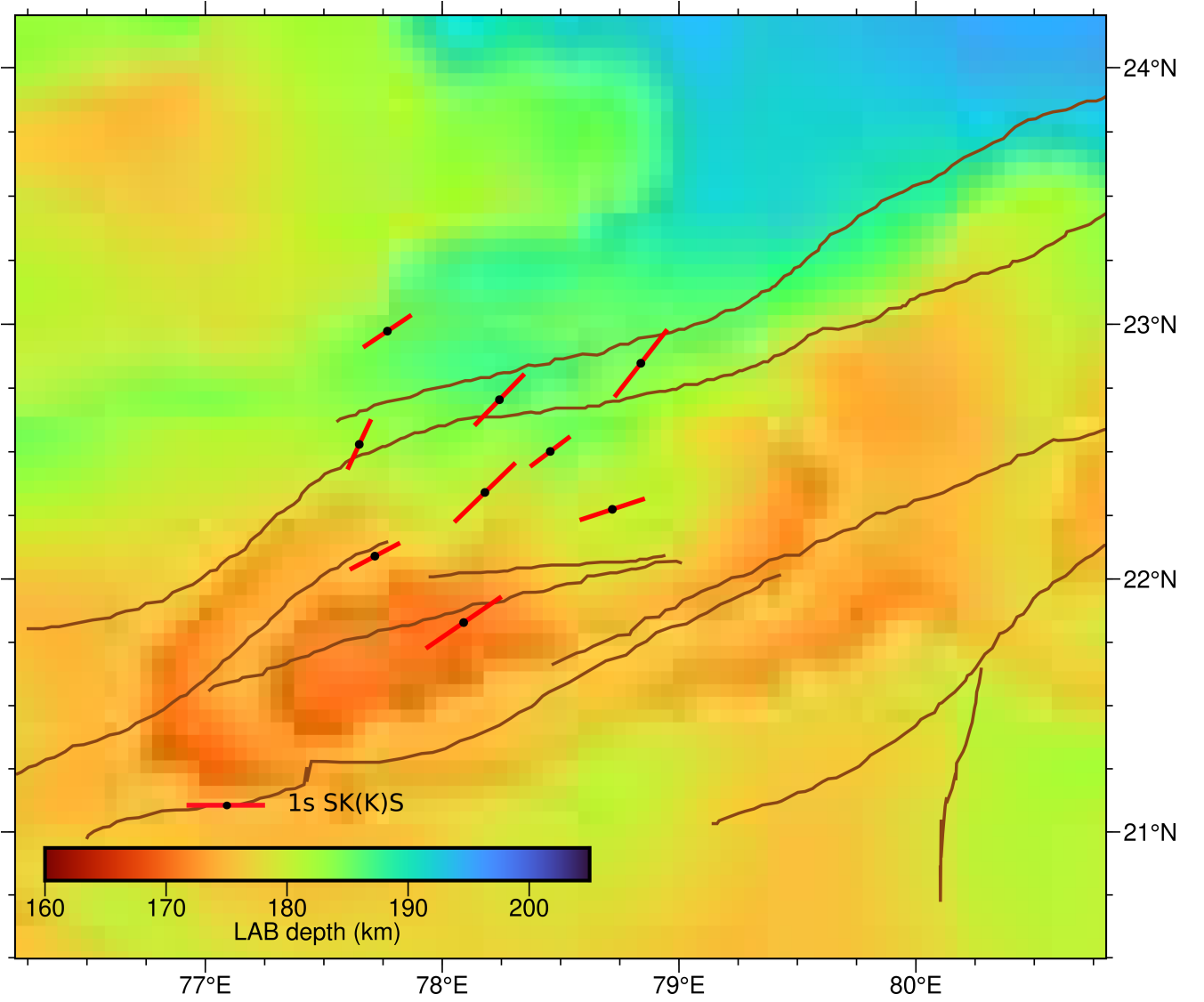


Figure S3: The figure shows the lithospheric-asthenospheric boundary (LAB) depth (from Kumar & Mohanty (2025)) in the study area, as well as the station-averaged splitting parameters for each seismic station. The black dots are the stations. The black dots denote the location of the stations. The inclination of each bar represents the fast polarization direction (FPD), while the length denotes the delay time (δt).

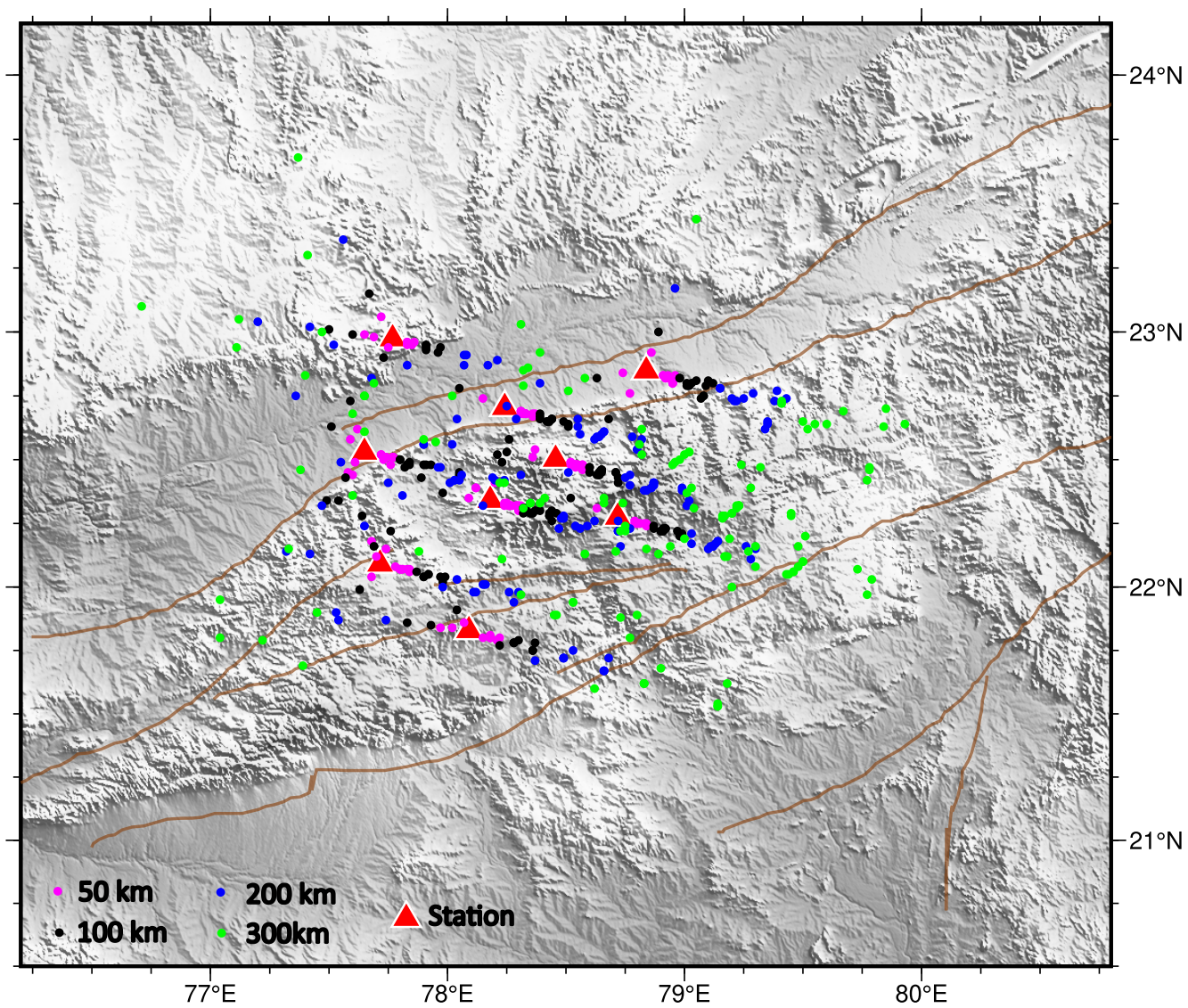


Figure S4: Piercing points of SKS and SKKS phases at depths of 50, 100, 200 and 300 km.