Signal Quality from Explosive Surface Sources in Antarctica: Supplementary Material

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TABLES

Table 1. Poulter explosive source descriptions for sources fired at shotpoint 2 as part of source testing near West Antarctic Ice Sheet (WAIS) Divide.

Shot ID	Weight (kg)	Height (m)	Type	Description
5027	5.0	2.44	dynamite	2- 75x400mm charges
5028	2.5	2.44	dynamite	1- 75x400mm charge
5029	5.4	2.44	5kg emulsion + 400g pentolite booster	2- 75x400mm charges + 400g booster
5030	4.0	2.44	10 400g pentolite booster	10 boosters taped on horizontal wood

Table 2. Detonating cord explosive source descriptions for sources fired at shotpoint 2 as part of source testing near West Antarctic Ice Sheet (WAIS) Divide.

Shot ID	Weight (kg)	Length (m)	Type	Shape	Description
5031	0.18	16.4	10.8 g/m	line	parallel to receiver line
5032	0.18	16.4	10.8 g/m	line	perpendicular to receiver line
5033	0.18	16.4	10.8 g/m	swirl	fired inside out
5034	0.22	20.4	10.8 g/m	swirl	fired inside out
5035	0.35	32.4	10.8 g/m	swirl	fired inside out
5036	0.18	16.4	10.8 g/m	swirl	fired outside in
5037	0.22	20.4	10.8 g/m	swirl	fired outside in
5038	0.35	32.4	10.8 g/m	swirl	fired outside in
5039	0.18	8.2	10.8 g/m	cross	2- 8.2m lengths
5040	0.26	12.2	10.8 g/m	cross	2- 12.2m lengths
5041	0.35	16.2	10.8 g/m	cross	2- 16.2m lengths

Table 3. Description of shallowly-drilled explosive sources located nearest to shotpoint 2 (each 30 meters from shotpoint 2 along receiver line; shot 5073 is northeast of shotpoint 2 and shot 5072).

Shot ID	Weight (kg)	Depth (m)	Type	Description
5072	0.3	3.1	booster	2- 0.15kg booster
5073	0.3	3.1	booster	2- 0.15kg booster

Table 4. Poulter explosive source descriptions for sources fired at shotpoint 3 as part of source testing near West Antarctic Ice Sheet (WAIS) Divide.

Shot ID	Weight (kg)	Height (m)	Type	Description
5042	5.0	2.44	dynamite	2- 75x400mm charges
5043	2.5	2.44	dynamite	1- 75x400mm charge
5044	5.4	2.44	5kg emulsion + 400g pentolite booster	2- 75x400mm charges + 400g booster
5045	4.0	2.44	10 400g pentolite booster	10 boosters taped on horizontal wood

Table 5. Detonating cord explosive source descriptions for sources fired at shotpoint 3 as part of source testing near West Antarctic Ice Sheet (WAIS) Divide.

Shot ID	Weight (kg)	Length (m)	Type	Shape	Description
5046	1.08	16.4	10.8 g/m	4- 25m lines	parallel to receiver line
5047	0.35	32.4	10.8 g/m	swirl	fired inside out
5048	0.35	32.4	10.8 g/m	swirl	fired outside in
5049	0.54	25	10.8 g/m	2- 25m lines	parallel to receiver line
5050	1.89	25	10.8 g/m	7- 25m lines	parallel to receiver line

Table 6. Description of shallowly-drilled explosive source at shotpoint 3.

Shot ID	Weight (kg)	Depth (m)	Type	Description
5091	0.3	3.1	pentolite booster	2- 0.15kg booster

15 # FIGURES

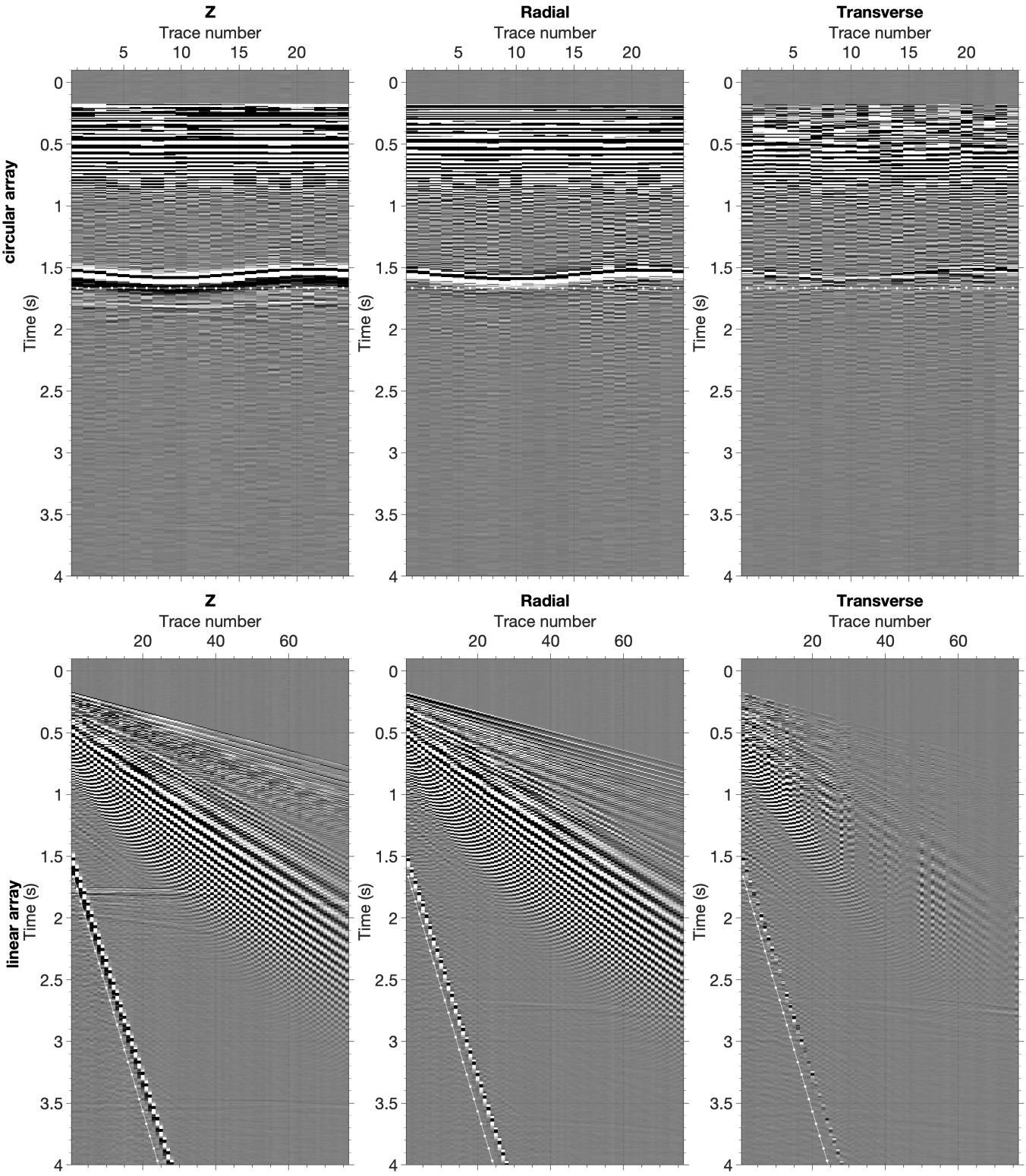

Fig. 1. Shot gather recorded on a) array 2 (circle of 24 nodes) and b) array 1 (line of 75 nodes) for Poulter shot 5004, 10 pentolite, 400-gram boosters taped to wood, suspended at 8 feet above the ice, detonated at shot point 1. The white line is the theoretical air wave. The data are the same as Figure 3, except with time scale extended to 4 seconds. The white line is the theoretical air wave.

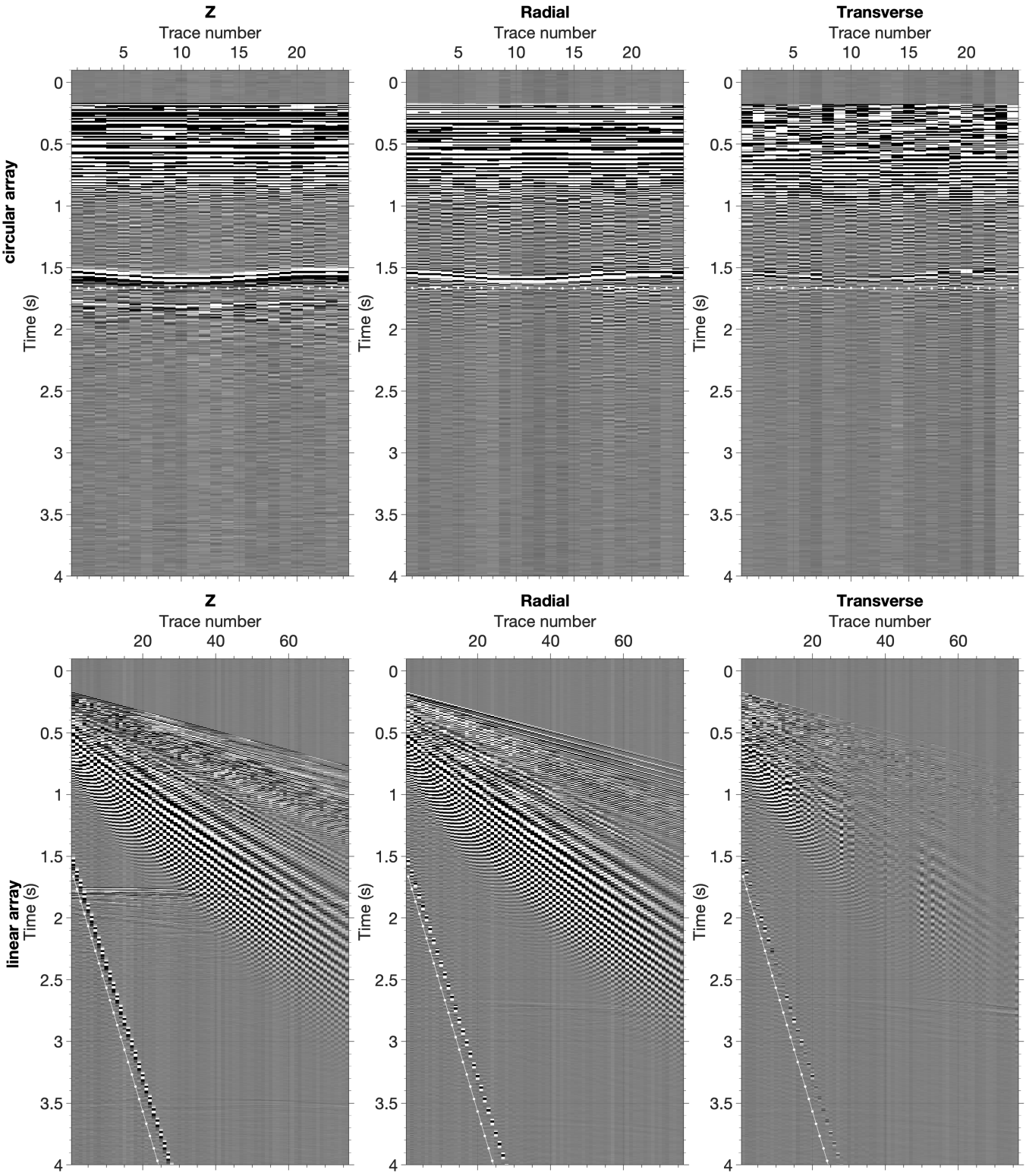

Fig. 2. Shot gather recorded on a) array 2 (circle of 24 nodes) and b) array 1 (line of 75 nodes) for detonating cord shot 5026, a swirl using 32.4m 85 g/m fired inside out with 4m diameter, 2.75 kg explosives, detonated at shot point 1. The white line is the theoretical air wave. The data are the same as Figure 4, except with time scale extended to 4 seconds. The white line is the theoretical air wave.

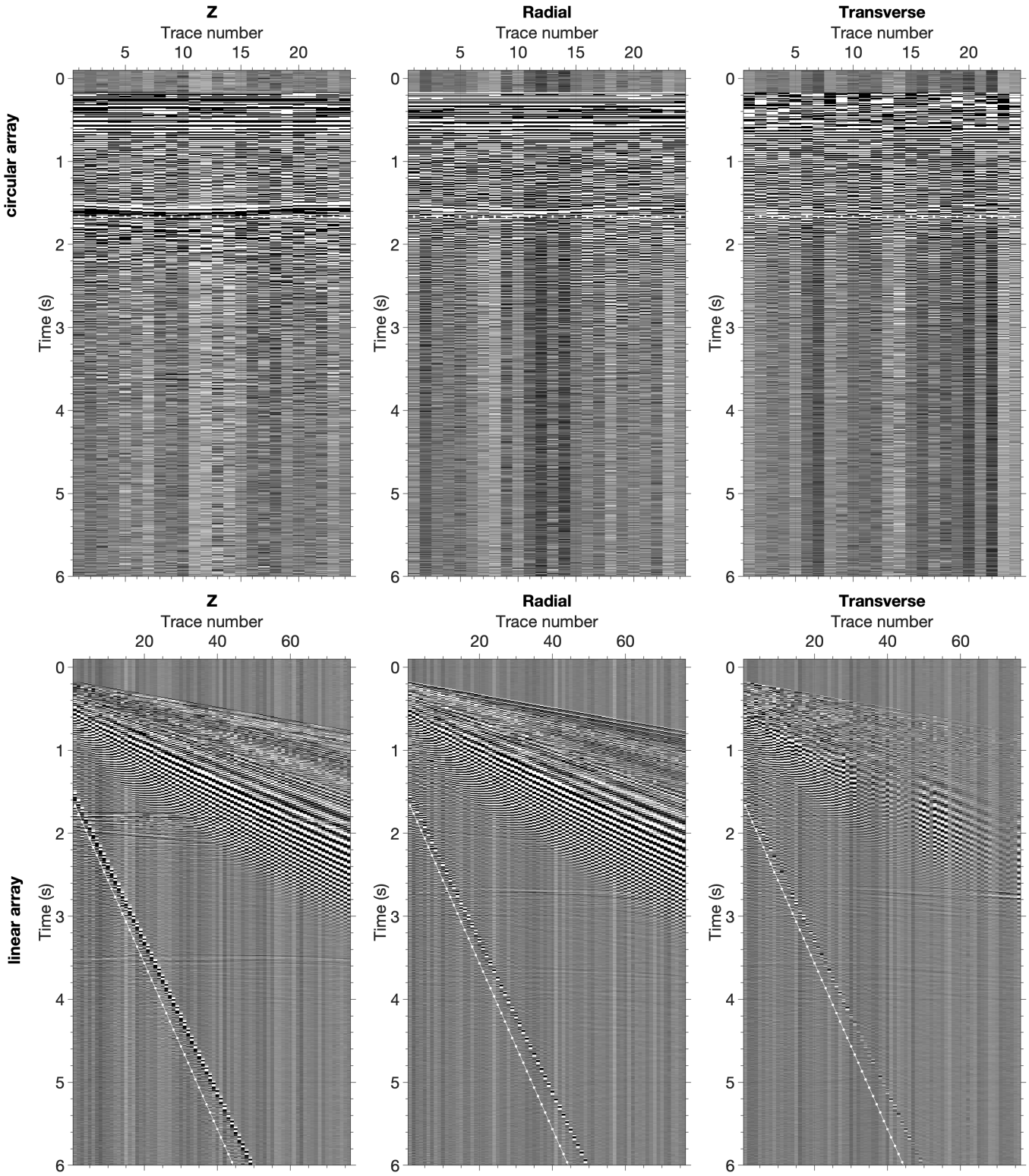

Fig. 3. Shot gather recorded on a) array 2 (circle of 24 nodes) and b) array 1 (line of 75 nodes) for detonating cord shot 5026, a swirl using 32.4m 85 g/m fired inside out with 4m diameter, 2.75 kg explosives, detonated at shot point 1. The data are the same as Figure 4 and Figure S3, except with time scale extended to 6 seconds. The white line is the theoretical air wave.

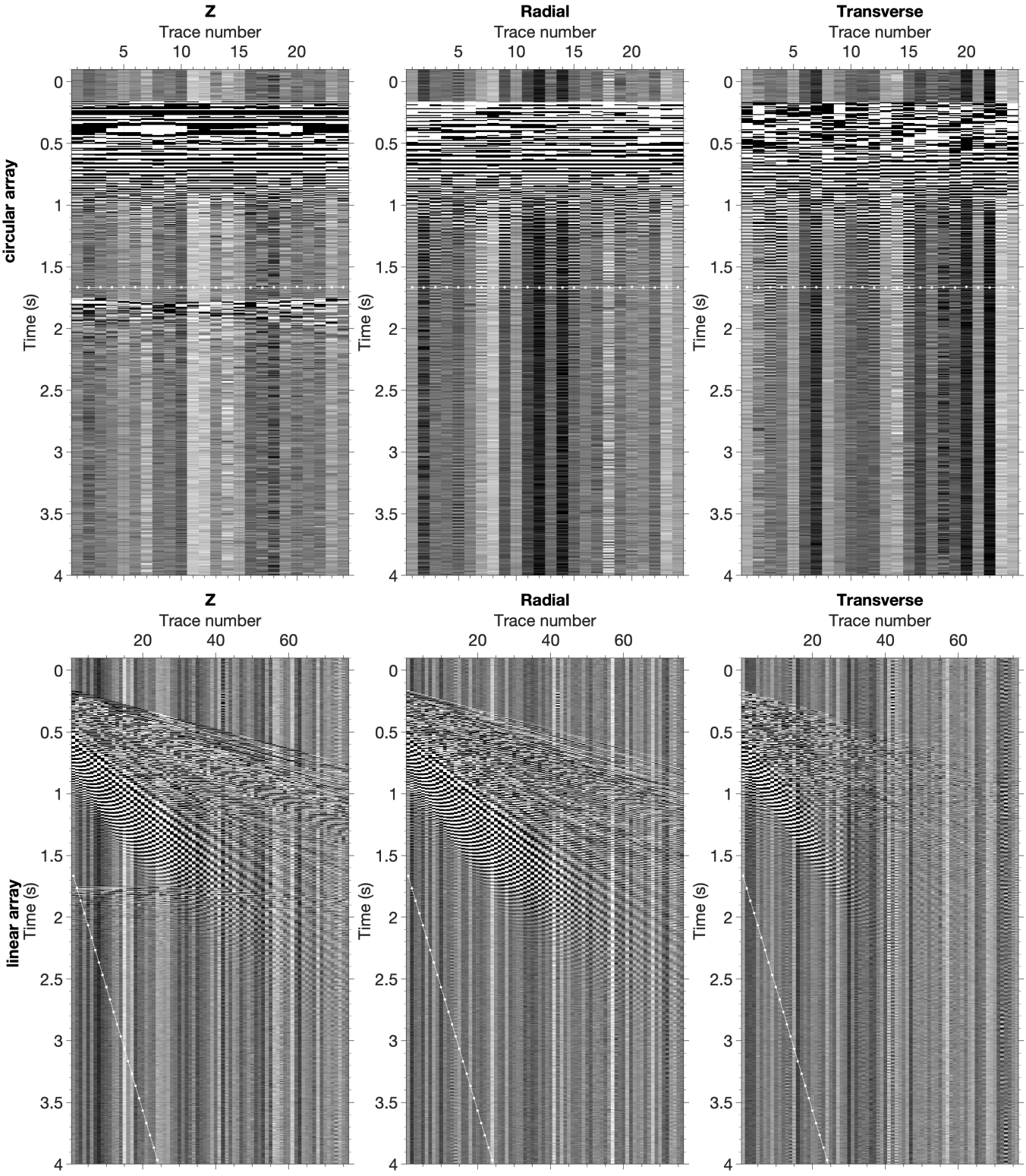

Fig. 4. Shot gather recorded on a) array 2 (circle of 24 nodes) and b) array 1 (line of 75 nodes) for shot 5053, a shallow drilled shot of 300 g detonated at 3.1 m depth, in a hole drilled by a Kovacs ice drill. The white line is the theoretical air wave.

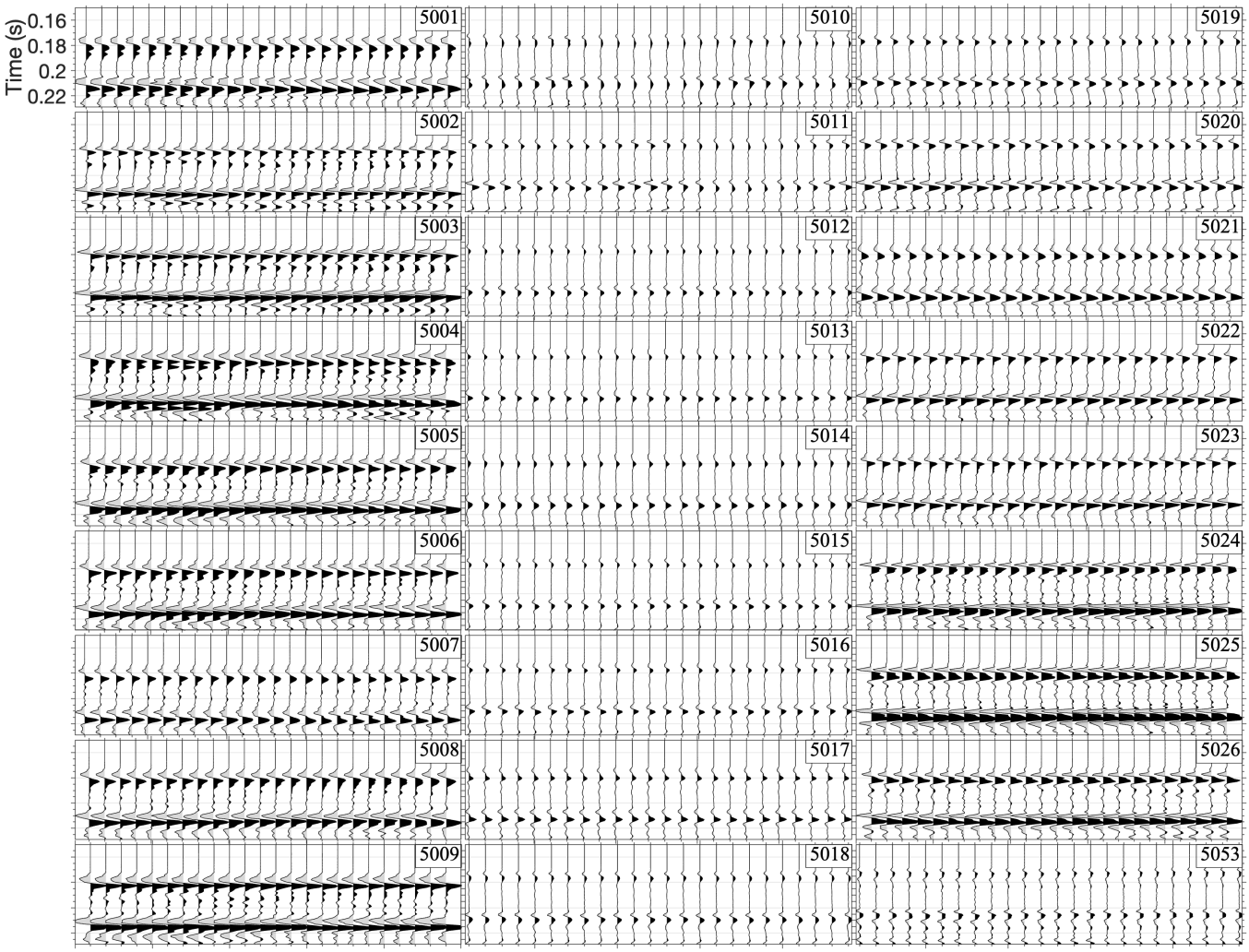

Fig. 5. Plots showing vertical component waveforms recorded on the 24 seismic nodes in the circle for all of the different types of sources detonated at shotpoint 1 in order to compare wavelet similarity. Data shown is the same as Figure 5 without amplitude normalization. DC amplitude is removed to make the mean amplitude of each shot zero. 5001-5009 are Poulter shots. 5010 to 5026 are detonating cord shots. 5053 is a shallowly drilled shot. Configuration details for each shot are detailed in Tables 1-3.

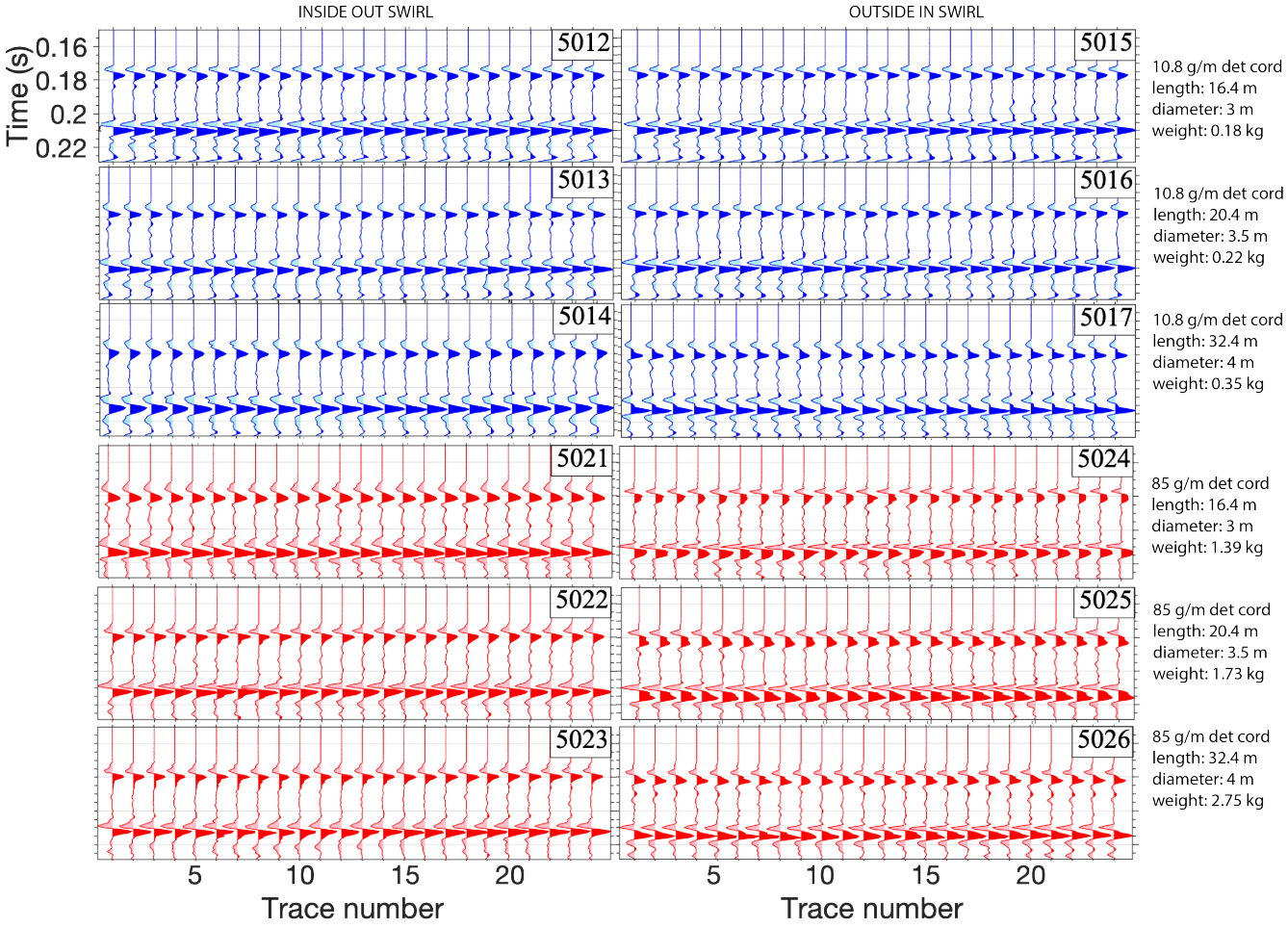

Fig. 6. Plots showing vertical component waveforms recorded on the 24 seismic nodes in the circle for the various detonating cord swirl sources detonated at shotpoint 1 in order to compare wavelet similarity. Amplitudes are normalized for each shot, so amplitudes cannot be compared between different shot points. Data for these shots is the same as Figure 5, but the detonating cord swirls are arranged to facilitate comparison. DC amplitude is removed to make the mean amplitude of each shot zero. Configuration details for each shot are detailed in Tables 1-3. Figure S7 shows the same data without amplitude normalization.

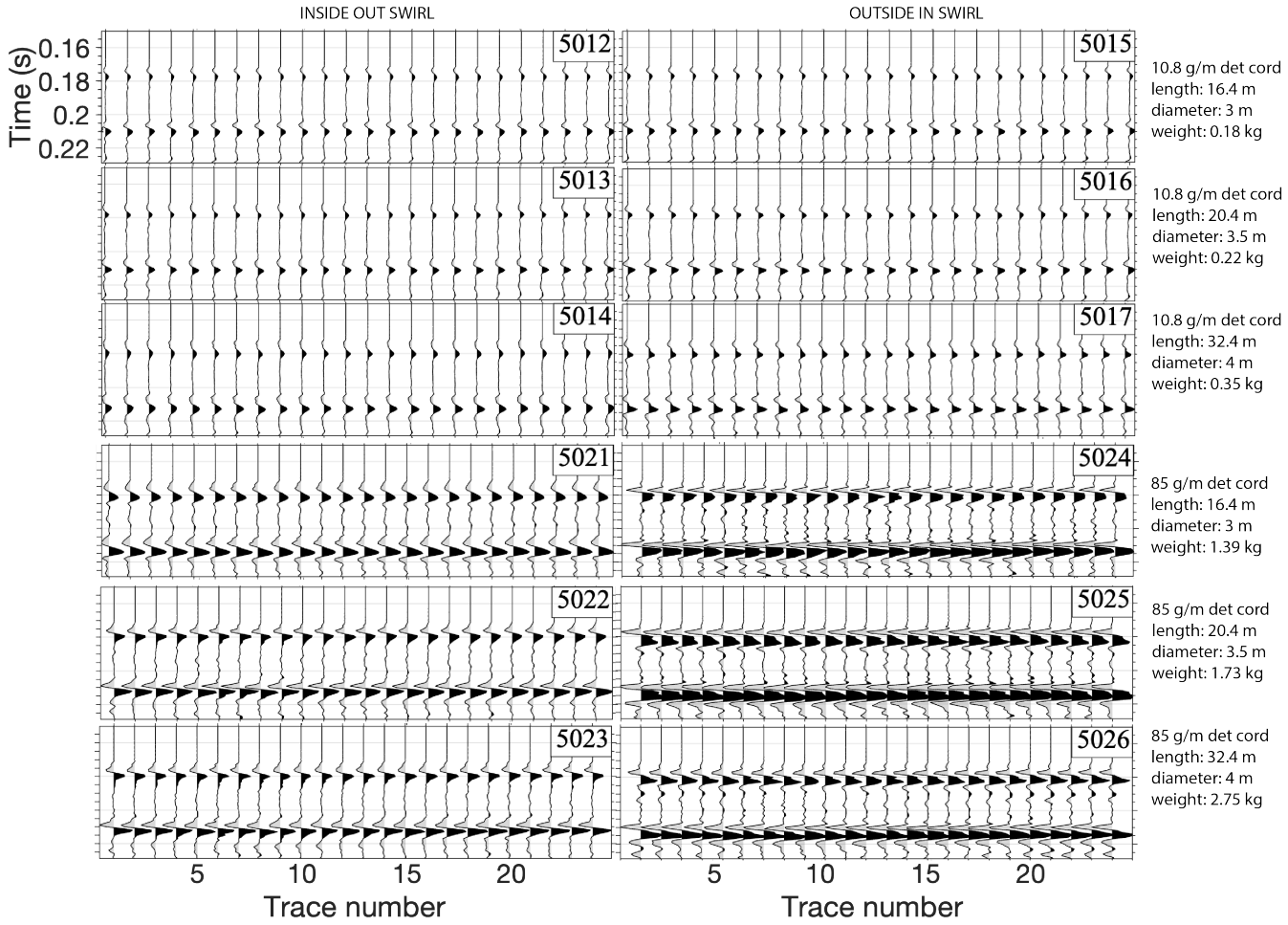

Fig. 7. Plots showing vertical component waveforms recorded on the 24 seismic nodes in the circle for the various detonating cord swirl sources detonated at shotpoint 1 in order to compare wavelet similarity. Data shown is the same as Figure S6 without amplitude normalization. Data for these shots is the same as Figure S5, but the detonating cord swirls are arranged to facilitate comparison. DC amplitude is removed to make the mean amplitude of each shot zero. Configuration details for each shot are detailed in Tables 1-3.