SUPPLEMENTARY MATERIAL

This supplementary material presents the full quantitative results on the Aeva dataset using both KITTI Relative Pose Error metric (Table IV) and Frame-to-Frame Relative Pose Error metric (Table V) [40]. Note again that all algorithms are evaluated using motion-distorted frames, and we exclude the first 60 frames of each sequence from evaluation. Results of **Seq. 04-07 (Range-Limited)** were obtained by limiting the range of the lidar frames to 40m.

Results of the translation error have been reported and discussed in the main text. Regarding the rotation error, we see that Doppler-ICP seems to do slightly better in rotation on the Frame-to-Frame metric. However, the overall difference between Doppler-ICP and STEAM-DICP is not significant, and our algorithm outperforms theirs on the KITTI metric, which averages rotation error over longer trajectory segments.

TABLE IV: Quantitative results on Aeva dataset using KITTI Relative Pose Error metric.

	Translation [%]					Rotation [deg/m]				
Sequences 00-03	00	01	02	03	**AVG**	00	01	02	03	**AVG**
Doppler-ICP [6]	**1.66**	**2.60**	1.03	1.72	**1.80**	0.0330	**0.0143**	0.0335	0.0064	0.0122
CT-ICP [21]	2.83	12.26	9.11	**1.54**	3.35	0.0085	0.0148	**0.0121**	**0.0038**	**0.0062**
STEAM-ICP (Ours)	2.28	12.86	22.74	2.10	4.16	0.0078	0.0155	0.0124	0.0040	0.0063
STEAM-DICP (Ours)	2.35	**2.60**	**0.74**	1.70	1.88	**0.0077**	0.0166	0.0137	0.0040	0.0065
Sequences 04-07	04	05	06	07	**AVG**	04	05	06	07	**AVG**
Doppler-ICP [6]	6.26	4.01	3.40	4.25	4.65	0.0155	0.0124	0.0147	0.0100	0.0135
CT-ICP [21]	**2.81**	3.03	2.48	**2.08**	**2.63**	0.0058	**0.0054**	0.0118	**0.0072**	0.0076
STEAM-ICP (Ours)	2.84	**3.02**	2.44	2.09	**2.63**	0.0058	**0.0054**	0.0117	**0.0072**	**0.0075**
STEAM-DICP (Ours)	2.82	3.08	**2.41**	2.09	**2.63**	**0.0057**	0.0056	**0.0116**	**0.0072**	**0.0075**
Seq. 04-07 (Range-Limited)	04	05	06	07	**AVG**	04	05	06	07	**AVG**
Doppler-ICP [6]	15.53	7.35	4.44	6.84	9.21	0.0386	0.0239	0.0189	0.0124	0.0252
CT-ICP [21]	12.24	56.98	67.06	5.98	34.65	0.0338	0.2092	0.2253	0.0190	0.1176
STEAM-ICP (Ours)	68.30	5.23	3.64	4.80	25.59	0.1239	0.0105	0.0143	0.0112	0.0491
STEAM-DICP (Ours)	**3.92**	**4.98**	**3.23**	**3.04**	**3.80**	**0.0095**	**0.0104**	**0.0135**	**0.0109**	**0.0110**

TABLE V: Quantitative results on Aeva dataset using Frame-to-Frame Relative Pose Error metric.

	Translation [m]					Rotation [deg]				
Sequences 00-03	00	01	02	03	**AVG**	00	01	02	03	**AVG**
Doppler-ICP [6]	0.0246	0.0254	0.0380	0.0494	0.0402	0.1357	**0.1670**	0.1655	**0.0827**	**0.1163**
CT-ICP [21]	0.0401	0.3753	0.2446	0.0801	0.1827	0.1907	0.2865	0.1593	0.1163	0.1675
STEAM-ICP (Ours)	0.0541	0.4134	0.6076	0.2892	0.3180	**0.1322**	0.1855	0.1503	0.1195	0.1366
STEAM-DICP (Ours)	**0.0180**	**0.0211**	**0.0299**	**0.0362**	**0.0299**	0.1384	0.1821	**0.1475**	0.1125	0.1336
Sequences 04-07	04	05	06	07	**AVG**	04	05	06	07	**AVG**
Doppler-ICP [6]	0.1033	0.0832	0.0701	0.2427	0.1338	**0.0968**	**0.0710**	**0.1298**	**0.1060**	**0.1009**
CT-ICP [21]	0.0586	0.0697	0.0715	0.0570	0.0645	0.1081	0.0838	0.1432	0.1189	0.1134
STEAM-ICP (Ours)	0.0592	0.0714	0.0727	0.0606	0.0660	0.1059	0.0832	0.1427	0.1171	0.1121
STEAM-DICP (Ours)	**0.0557**	**0.0675**	**0.0695**	**0.0566**	**0.0624**	0.1050	0.0817	0.1417	0.1159	0.1110
Seq. 04-07 (Range-Limited)	04	05	06	07	**AVG**	04	05	06	07	**AVG**
Doppler-ICP [6]	0.2643	0.1813	**0.0724**	0.4098	0.2537	0.1439	**0.1039**	**0.1453**	**0.1237**	**0.1309**
CT-ICP [21]	0.1020	1.9124	1.8927	0.0826	1.3285	0.1770	71.1786	77.2651	0.1650	36.2508
STEAM-ICP (Ours)	1.6031	0.1281	0.0946	0.1854	0.9072	0.8504	0.1385	0.1909	0.1552	0.3794
STEAM-DICP (Ours)	**0.0581**	**0.0725**	0.0726	**0.0706**	**0.0679**	**0.1437**	0.1198	0.1794	0.1477	0.1479