TABLE 1 – Comparison Solver LSQ for problem with $n = 2^t$ and $m = 2^{t-1}$

Size-$n - m$	Iter	Cost	KKTresidual	Time	Niter–lsmr
2–4	5	1.230896e-16	3.483231e-09	0.329	166
16–32	5	4.408788e-16	2.259648e-09	2.222	905
32–64	4	2.200167e-10	2.988557e-06	2.602	1048
64–128	4	5.825479e-12	2.974276e-07	3.726	1326
128–256	4	2.259802e-12	1.046838e-07	7.069	1712
256–512	4	1.432533e-11	1.562241e-07	11.700	1574
512–1024	4	8.826758e-10	3.566932e-07	27.606	1586
1024–2048	4	7.995618e-09	2.659557e-07	74.997	1583
2048–4096	4	2.428468e-07	9.899630e-07	250.844	1659

TABLE 2 – Comparison Solver l1ls for problem with $n = 2^t$ and $m = 2^{t-1}$

Size-$n - m$	Iter	Cost	KKTresidual	Time	PCG–iter
2–4	45	7.07e-11	5.50e-17	0.21	90
8–16	51	7.07e-11	4.93e-17	0.56	430
16–32	53	7.07e-11	4.87e-17	0.63	613
32–64	55	7.07e-11	5.55e-17	0.72	560
64–128	61	7.07e-11	4.21e-17	0.84	592
128–256	64	7.07e-11	5.15e-17	1.08	657
256–512	74	7.07e-11	6.41e-17	1.87	756
512–1024	74	7.07e-11	5.35e-17	3.71	915
1024–2048	76	7.07e-11	6.83e-17	5.50	1009
2048–8192	82	7.07e-11	6.37e-17	27.14	926

TABLE 3 – Comparison Solver PDCO using SPOT–LSMR for problem with $n = 2^t$ and $m = 2^{t-1}$

Size-$n - m$	Iter	Cost	KKTresidual	Time	Niter–lsmr
2–4	35	7.07e-08	5.23e-14	0.27	176
8–16	300	8.09e-06	3.72e-06	12.01	11981
16–32	130	1.60e-05	9.94e-07	10.52	10362
32–64	108	3.20e-05	9.76e-07	8.31	15243
64–128	62	6.40e-05	9.84e-07	9.09	9462
128–256	67	1.28e-04	9.83e-07	27.93	11218
256–512	57	2.56e-04	7.66e-07	91.68	9758
512–1024	54	5.12e-04	9.77e-07	329.28	9953
1024–2048	47	1.08e-03	9.26e-07	1159.47	8002
2048–4096	46	2.82e-03	9.09e-07	5540.57	7994

TABLE 4 – Comparison Solver LSQ for DCT problem with $n = 2^t$ and $m = 2^{t-1}$

Size-$n - m$	Iter	Cost	KKTresidual	Time	Niter–lsmr
8–16	4	6.698405e-13	3.389380e-08	0.128	32
16–32	4	1.339681e-12	3.389379e-08	0.138	32
32–64	4	2.679362e-12	3.389378e-08	0.168	32
64–128	4	5.358724e-12	3.389377e-08	0.242	33
128–256	4	1.071745e-11	3.389378e-08	0.321	32
256–512	4	2.143490e-11	3.389380e-08	0.555	33
512–1024	4	4.286979e-11	3.389380e-08	1.009	33
1024–2048	4	8.573959e-11	3.389377e-08	2.016	33
2048–4096	4	1.714792e-10	3.389377e-08	3.562	33
4096–8192	4	3.429584e-10	3.389378e-08	7.012	34
8192–16384	4	6.859167e-10	3.389383e-08	13.612	34
16384–32768	4	1.371833e-09	3.389379e-08	28.104	34
32768–65536	4	2.743667e-09	3.389408e-08	55.205	35
65536–131072	4	5.487334e-09	3.389353e-08	139.997	35

TABLE 5 – Comparison Solver l1ls for DCT problem with $n = 2^t$ and $m = 2^{t-1}$

Size-$n-m$	Iter	Cost	KKTresidual	Time	Niter–lsmr
2–4	41	1.41e-09	9.09e-16	0.76	41
8–16	39	5.65e-09	3.64e-15	0.67	39
16–32	37	1.13e-08	1.46e-14	0.76	37
32–64	37	2.26e-08	1.46e-14	0.63	37
64–128	38	4.52e-08	6.31e-14	0.61	38
128–256	36	9.04e-08	1.15e-13	0.53	36
256–512	34	1.81e-07	4.35e-13	0.54	34
512–1024	30	3.62e-07	1.86e-12	0.51	30
1024–2048	32	7.24e-07	1.88e-12	0.73	32
8192–16384	32	5.79e-06	6.29e-11	1.08	32
16384–32768	29	1.16e-05	1.14e-10	1.27	29
32768–65536	29	2.32e-05	1.83e-10	1.83	29
65536–131072	31	4.63e-05	6.10e-11	3.12	31
131072–262144	31	9.26e-05	1.22e-10	7.04	31

TABLE 6 – Comparison Solver PDCO for DCT problem with $n = 2^t$ and $m = 2^{t-1}$

Size-$n-m$	Iter	Cost	KKTresidual	Time	Niter–lsmr
2–4	21	4.03e-06	7.05e-07	1.41	104
8–16	21	1.61e-05	7.06e-07	1.32	104
16–32	23	1.72e-05	4.80e-07	1.49	116
32–64	26	1.41e-05	2.57e-07	1.68	155
64–128	25	3.22e-05	5.76e-07	1.75	149
128–256	26	2.95e-04	1.46e-07	1.60	157
256–512	29	1.41e-04	9.18e-07	1.84	203
512–1024	30	8.42e-04	1.33e-07	3.14	239
1024–2048	34	4.92e-04	9.10e-09	7.94	272
16384–32768	33	4.26e-02	7.19e-07	85.51	328
32768–65536	38	2.68e-02	3.99e-07	203.53	378
65536–131072	39	1.01e-01	2.69e-09	552.61	419
131072–262144	43	7.48e-02	5.50e-10	1444.58	466