Table 1 Numerical results for the first group

Problems(Name/n)	LS Itr/Tcpu/ $\|g_*\|$	HS Itr/Tcpu/ $\|g_*\|$	PRP Itr/Tcpu/ $\|g_*\|$	FHTTCGM-PRP Itr/Tcpu/ $\|g_*\|$	FHTTCGM-HS Itr/Tcpu/ $\|g_*\|$	FHTTCGM-LS Itr/Tcpu/ $\|g_*\|$
cosine/6000	1967/4.614/3.58e-07	F/F/F	83/0.265/9.93e-07	33/0.053/8.42e-07	33/0.058/8.42e-07	33/0.053/8.42e-07
cosine/100000	F/F/F	F/F/F	F/F/F	96/1.326/6.40e-07	138/1.900/9.67e-07	70/0.993/9.92e-07
cosine/800000	F/F/F	F/F/F	F/F/F	38/5.660/5.82e-07	38/5.661/5.82e-07	38/5.653/5.82e-07
dixmaana/6000	35/0.421/5.25e-07	30/0.336/9.70e-07	35/0.402/4.77e-07	15/0.146/6.15e-07	15/0.144/6.15e-07	15/0.147/6.15e-07
dixmaana/90000	62/10.423/4.58e-07	44/5.452/5.47e-07	48/6.721/2.32e-07	23/2.170/8.53e-07	23/2.226/8.53e-07	23/2.189/8.53e-07
dixmaanb/24000	48/2.358/8.50e-07	29/1.282/4.52e-07	31/1.344/2.74e-07	20/0.627/2.96e-08	18/0.609/6.37e-07	16/0.583/1.81e-07
dixmaanb/48000	41/3.670/7.33e-07	30/2.052/5.73e-07	37/2.766/6.00e-07	16/1.067/6.66e-07	16/1.064/6.66e-07	16/1.059/6.66e-07
dixmaanc/2700	67/0.398/7.35e-07	29/0.110/3.46e-07	33/0.139/5.60e-07	16/0.059/5.42e-07	16/0.058/5.42e-07	16/0.063/5.42e-07
dixmaanc/27000	43/1.930/8.49e-07	30/1.513/7.18e-07	39/1.909/5.40e-07	16/0.633/1.01e-07	16/0.645/1.01e-07	16/0.634/1.01e-07
dixmaand/12000	35/0.760/6.40e-08	40/0.752/2.39e-07	33/0.743/9.25e-07	21/0.324/5.38e-07	20/0.314/9.22e-07	19/0.323/1.84e-07
dixmaand/90000	49/6.795/4.67e-07	41/4.545/5.72e-07	30/4.023/2.92e-07	16/2.008/5.55e-07	16/2.025/5.55e-07	16/2.073/5.55e-07
dixmaane/2400	516/1.385/9.15e-07	375/0.397/8.83e-07	484/1.190/9.99e-07	361/0.448/8.24e-07	348/0.455/5.75e-07	356/0.510/4.43e-07
dixmaane/48000	F/F/F	1514/30.533/6.39e-07	F/F/F	1315/30.676/6.93e-07	1224/28.202/8.79e-07	1171/27.234/9.02e-07
dixmaanf/15000	1134/18.221/8.82e-07	858/6.021/6.20e-07	991/15.870/7.51e-07	635/5.125/5.90e-07	612/4.788/9.25e-07	761/6.135/7.40e-07
dixmaanf/60000	F/F/F	1487/37.528/9.24e-07	1545/103.656/8.91e-07	1376/41.335/4.27e-07	1068/30.716/7.54e-07	1408/41.133/7.20e-07
dixmaang/12000	1229/15.269/9.93e-07	724/4.124/9.21e-07	984/13.243/8.90e-07	631/4.215/9.66e-07	691/4.554/6.69e-07	618/4.299/8.76e-07
dixmaang/90000	F/F/F	F/F/F	F/F/F	F/F/F	F/F/F	1826/76.447/9.88e-07
dixmaanh/6000	839/5.512/8.19e-07	536/1.578/9.72e-07	879/6.376/8.38e-07	325/1.110/6.34e-07	417/1.390/7.23e-07	375/1.235/8.19e-07
dixmaanh/150000	F/F/F	F/F/F	1898/287.391/9.05e-07	F/F/F	1919/139.400/9.81e-07	1712/121.443/9.68e-07
dixmaani/360	F/F/F	F/F/F	F/F/F	F/F/F	1841/0.472/9.94e-07	F/F/F
dixmaanj/3000	F/F/F	F/F/F	F/F/F	F/F/F	F/F/F	1988/2.830/8.85e-07
dixmaanj/15000	1223/18.443/8.51e-07	1066/7.408/9.58e-07	1070/17.108/9.99e-07	469/3.847/6.95e-07	563/4.553/6.37e-07	594/5.078/6.29e-07
dixmaank/12000	1367/16.994/8.22e-07	778/4.432/8.63e-07	1014/13.540/7.37e-07	363/2.396/5.42e-07	426/2.825/4.51e-07	268/1.875/8.23e-07
dixmaank/120000	F/F/F	1389/67.776/9.90e-07	377/43.646/8.93e-07	882/48.674/8.67e-07	786/43.375/9.77e-07	886/49.828/7.97e-07
dixmaanl/2400	F/F/F	F/F/F	F/F/F	746/0.932/7.94e-07	656/0.788/9.33e-07	694/0.854/9.52e-07
dixmaanl/24000	1499/34.778/9.83e-07	1001/10.748/9.06e-07	986/25.293/9.02e-07	128/1.718/9.42e-07	103/1.428/6.69e-07	102/1.418/8.33e-07
dixon3dq/150	F/F/F	1874/0.070/9.30e-07	F/F/F	1361/0.062/5.72e-07	1591/0.071/6.71e-07	1372/0.067/7.63e-07
dqdrtic/9000	143/0.263/1.82e-07	70/0.071/8.05e-07	110/0.121/9.16e-07	68/0.058/8.26e-07	79/0.063/7.81e-07	82/0.060/6.73e-07
dqdrtic/90000	140/0.666/5.18e-07	95/0.304/4.48e-07	106/0.375/5.66e-07	87/0.223/4.67e-07	80/0.225/4.96e-07	84/0.220/5.96e-07
dqrtic/5000	61/0.402/2.70e-07	60/0.266/2.86e-07	52/0.265/2.32e-07	29/0.171/1.48e-07	34/0.185/7.29e-07	36/0.182/4.90e-07
dqrtic/150000	156/24.976/8.35e-07	133/14.195/5.10e-08	122/21.856/5.72e-07	86/10.227/7.73e-07	94/10.534/4.79e-07	81/9.138/7.25e-07
edensch/7000	154/2.096/6.70e-07	F/F/F	78/0.922/9.72e-07	67/0.615/8.55e-07	46/0.307/9.42e-07	52/0.332/8.39e-07
edensch/40000	230/17.969/7.26e-07	444/28.099/5.76e-07	98/6.342/7.14e-07	43/1.845/2.17e-07	43/1.852/2.17e-07	43/1.855/2.17e-07
edensch/500000	178/164.330/8.45e-07	466/345.974/9.86e-07	1118/1256.338/3.29e-07	56/37.475/3.91e-07	51/33.089/2.59e-07	44/25.260/8.81e-07
eg2/100	225/0.123/7.76e-07	123/0.016/7.31e-07	606/0.098/8.14e-07	633/0.054/7.27e-07	501/0.053/8.85e-07	581/0.053/8.76e-07
fletchcr/1000	254/0.090/8.24e-07	F/F/F	285/0.087/6.81e-07	81/0.006/4.58e-07	64/0.009/8.48e-07	108/0.027/8.02e-07
fletchcr/50000	375/3.127/6.48e-07	F/F/F	726/5.925/9.51e-07	98/0.619/5.25e-07	205/1.518/5.72e-07	136/0.992/4.53e-07
fletchcr/200000	358/8.900/8.05e-07	F/F/F	874/21.670/8.05e-07	176/4.014/4.45e-07	217/5.218/7.97e-07	195/4.909/8.64e-07
freuroth/460	F/F/F	F/F/F	963/0.300/9.70e-07	1532/0.531/9.62e-07	F/F/F	1228/0.406/9.55e-07
genrose/10000	F/F/F	F/F/F	F/F/F	279/0.186/5.81e-07	226/0.142/7.51e-07	242/0.160/8.95e-07
himmelbg/70000	2/0.135/3.51e-40	2/0.031/6.83e-40	2/0.030/3.51e-40	2/0.029/6.76e-43	2/0.029/6.76e-43	2/0.031/6.76e-43
himmelbg/240000	3/0.120/0.00e+00	3/0.122/0.00e+00	3/0.123/0.00e+00	2/0.092/6.53e-07	2/0.090/6.53e-07	2/0.091/6.53e-07
liarwhd/6000	119/0.162/9.35e-07	38/0.037/1.97e-07	113/0.110/3.66e-07	193/0.106/9.25e-07	176/0.091/5.65e-07	194/0.091/2.59e-07
liarwhd/30000	89/0.399/1.17e-07	47/0.153/7.63e-07	121/0.497/5.80e-07	271/0.607/6.78e-07	237/0.544/3.34e-07	181/0.403/5.11e-07
penalty1/4000	1573/593.733/9.84e-07	F/F/F	F/F/F	39/9.388/8.82e-07	39/9.400/8.82e-07	39/9.446/8.82e-07
penalty1/10000	681/2158.846/9.69e-07	F/F/F	57/112.485/7.31e-07	20/27.312/7.61e-07	20/27.370/7.61e-07	20/27.305/7.61e-07
quartc/4000	74/0.322/7.40e-07	50/0.175/7.09e-07	63/0.286/8.45e-07	42/0.149/9.41e-07	46/0.153/7.90e-07	47/0.167/7.47e-07
quartc/80000	124/11.012/3.83e-07	119/6.079/5.16e-07	119/11.193/9.28e-07	89/5.403/2.40e-07	89/5.683/9.87e-07	104/6.634/6.09e-07
quartc/500000	224/121.564/6.97e-07	180/59.117/1.89e-07	217/121.115/4.79e-07	102/39.036/5.83e-07	133/48.022/2.15e-07	114/40.384/7.17e-07
tridia/300	1030/0.128/9.19e-07	600/0.028/4.68e-07	1122/0.138/9.27e-07	756/0.038/9.61e-07	699/0.033/9.19e-07	671/0.034/8.92e-07

Table 2 Numerical results for the first group (continued)

Problems(Name/n)	LS	HS	PRP	FHTTCGM-PRP	FHTTCGM-HS	FHTTCGM-LS
	Itr/Tcpu/ $\|g_*\|$	Itr/Tcpu/ $\|g_*\|$	Itr/Tcpu/ $\|g_*\|$	Itr/Tcpu/ $\|g_*\|$	Itr/Tcpu/ $\|g_*\|$	Itr/Tcpu/ $\|g_*\|$
tridia/2000	F/F/F	F/F/F	F/F/F	1625/0.121/8.32e-07	F/F/F	1852/0.135/9.55e-07
woods/150000	322/2.454/1.81e-07	279/1.792/6.81e-07	602/4.626/9.69e-07	194/0.984/7.54e-07	228/1.108/8.75e-07	248/1.203/6.65e-07
woods/200000	317/3.314/8.31e-07	202/1.411/9.96e-07	394/3.698/9.68e-07	221/1.523/4.69e-07	231/1.564/5.70e-07	260/1.747/2.86e-07
bdexp/5000	2/0.084/2.19e-79	F/F/F	2/0.004/2.19e-79	2/0.004/2.48e-111	2/0.003/2.48e-111	2/0.004/2.48e-111
bdexp/50000	2/0.046/6.83e-37	F/F/F	2/0.044/6.83e-37	2/0.046/2.62e-89	2/0.046/2.62e-89	2/0.045/2.62e-89
bdexp/500000	2/0.393/1.72e-120	F/F/F	2/0.393/1.72e-120	2/0.417/1.55e-120	2/0.397/1.55e-120	2/0.398/1.55e-120
exdenschnf/90000	67/0.520/8.34e-07	51/0.358/7.78e-07	36/0.241/7.05e-07	31/0.125/3.04e-07	31/0.128/3.04e-07	31/0.128/3.04e-07
exdenschnf/280000	57/1.504/4.81e-07	42/0.797/2.87e-07	35/0.758/4.68e-07	27/0.478/6.84e-07	27/0.470/6.84e-07	27/0.474/6.84e-07
exdenschnf/600000	73/4.235/8.04e-07	43/1.815/3.29e-07	48/2.301/9.25e-07	27/1.092/4.33e-07	27/1.111/4.33e-07	27/1.095/4.33e-07
exdenschnb/6000	52/0.047/1.47e-07	32/0.012/5.37e-07	26/0.014/2.37e-07	20/0.007/4.42e-07	24/0.012/2.18e-07	20/0.007/3.12e-07
exdenschnb/24000	49/0.093/6.62e-07	32/0.061/9.32e-07	26/0.056/5.07e-07	20/0.034/8.84e-07	24/0.032/4.35e-07	20/0.035/6.25e-07
exdenschnb/300000	56/1.048/7.55e-07	41/0.733/9.19e-07	43/0.846/8.97e-07	18/0.378/6.66e-07	18/0.330/6.66e-07	18/0.327/6.66e-07
genquartic/9000	43/0.122/9.52e-07	88/0.111/1.26e-07	50/0.081/8.44e-07	20/0.022/9.83e-07	19/0.021/1.79e-07	20/0.021/6.01e-07
genquartic/90000	39/0.215/7.71e-07	1978/8.207/5.88e-07	70/0.376/7.62e-07	19/0.090/7.07e-07	17/0.097/4.63e-07	17/0.130/2.43e-07
genquartic/500000	48/2.005/9.28e-07	F/F/F	44/1.653/5.00e-07	21/0.699/9.07e-07	21/0.712/9.07e-07	21/0.703/9.07e-07
biggsb1/300	F/F/F	1894/0.074/7.28e-07	F/F/F	1642/0.075/7.31e-07	1423/0.066/8.44e-07	1210/0.055/7.30e-07
sine/100000	F/F/F	F/F/F	F/F/F	140/2.398/8.75e-07	140/2.205/8.75e-07	140/2.210/8.75e-07
sine/250000	F/F/F	F/F/F	F/F/F	41/1.900/5.07e-07	58/2.444/1.57e-07	129/5.325/1.77e-07
sine/500000	F/F/F	F/F/F	F/F/F	101/8.395/4.55e-07	101/8.344/4.55e-07	101/8.266/4.55e-07
fletcbv3/100	1020/0.222/7.07e-07	F/F/F	F/F/F	F/F/F	F/F/F	F/F/F
nonscomp/5000	96/0.062/3.45e-07	484/0.175/5.63e-07	98/0.050/8.78e-07	56/0.017/6.25e-07	51/0.024/2.66e-07	55/0.017/1.00e-06
nonscomp/80000	163/0.624/9.01e-07	F/F/F	119/0.459/8.29e-07	62/0.152/6.76e-07	65/0.165/8.90e-07	68/0.177/7.63e-07
power1/150	F/F/F	F/F/F	F/F/F	1922/0.084/9.49e-07	1935/0.089/9.37e-07	1799/0.080/6.85e-07
raydan1/500	623/0.098/8.83e-07	1035/0.097/9.97e-07	392/0.049/9.32e-07	221/0.013/6.89e-07	206/0.012/7.94e-07	206/0.011/6.82e-07
raydan1/5000	F/F/F	F/F/F	F/F/F	1846/0.634/6.93e-07	F/F/F	909/0.326/6.59e-07
raydan2/2000	654/0.381/4.15e-07	22/0.008/4.67e-07	55/0.018/9.63e-07	14/0.005/5.34e-07	14/0.004/5.34e-07	14/0.004/5.34e-07
raydan2/20000	510/3.327/3.44e-07	29/0.153/2.81e-07	21/0.101/3.81e-07	12/0.067/7.05e-07	12/0.062/7.05e-07	12/0.049/7.05e-07
raydan2/500000	633/60.854/4.29e-07	F/F/F	395/24.874/4.03e-07	19/1.403/9.19e-07	19/1.376/9.19e-07	19/1.344/9.19e-07
diagonal1/800	F/F/F	F/F/F	F/F/F	1134/0.437/8.67e-07	F/F/F	1148/0.457/7.81e-07
diagonal1/2000	F/F/F	F/F/F	F/F/F	1040/0.569/6.96e-07	F/F/F	1715/1.148/9.57e-07
diagonal2/8000	936/1.597/8.82e-07	689/0.894/9.48e-07	1084/2.435/6.71e-07	751/0.779/8.13e-07	671/0.688/9.11e-07	735/0.752/7.23e-07
diagonal2/50000	F/F/F	F/F/F	F/F/F	1555/7.919/9.54e-07	1640/8.256/7.54e-07	1707/8.301/8.62e-07
diagonal3/500	1796/0.837/7.31e-07	F/F/F	1870/0.866/8.82e-07	311/0.070/8.64e-07	367/0.101/9.94e-07	352/0.089/8.46e-07
diagonal3/2000	F/F/F	F/F/F	F/F/F	1087/0.899/2.93e-07	F/F/F	1196/1.177/7.96e-07
bv/2000	149/6.602/9.26e-07	47/3.362/9.71e-07	131/5.165/8.43e-07	97/2.041/8.37e-07	96/1.953/6.66e-07	90/1.846/8.91e-07
bv/20000	0/2.886/1.25e-08	0/2.889/1.25e-08	0/2.498/1.25e-08	0/1.890/1.25e-08	0/2.765/1.25e-08	0/0.948/1.25e-08
ie/500	34/14.526/3.29e-07	21/5.637/2.90e-07	41/15.579/9.18e-07	15/3.466/7.75e-07	15/3.416/7.75e-07	15/3.419/7.75e-07
ie/1500	35/131.220/1.06e-07	32/71.237/4.95e-07	39/127.171/6.50e-07	17/32.858/9.31e-07	17/32.847/9.31e-07	17/32.881/9.31e-07
singx/1000	285/4.472/8.03e-07	110/1.301/9.36e-07	401/5.567/6.86e-07	532/3.490/3.05e-07	470/3.199/2.65e-07	139/1.019/9.60e-07
singx/2000	334/15.148/2.59e-07	208/8.592/9.37e-07	624/26.972/6.13e-07	624/13.212/8.12e-07	318/6.930/9.40e-07	397/8.746/3.96e-07
lin/100	116/0.794/1.50e-07	28/0.073/6.86e-07	17/0.052/2.01e-07	13/0.046/8.86e-07	13/0.037/8.86e-07	13/0.048/8.86e-07
lin/1300	107/990.568/5.40e-07	46/263.274/7.20e-07	18/130.126/9.93e-07	22/108.467/7.30e-07	22/108.780/7.30e-07	22/107.792/7.30e-07
osb2/11	1083/0.618/9.59e-07	837/0.090/6.25e-07	1190/0.243/7.86e-07	589/0.076/9.30e-07	493/0.053/8.37e-07	714/0.074/7.58e-07
pen1/200	126/0.333/8.98e-07	94/0.116/7.05e-07	F/F/F	154/0.134/8.55e-07	F/F/F	184/0.159/5.78e-07
pen1/1000	259/10.031/6.42e-07	344/14.894/5.42e-07	F/F/F	153/3.724/4.35e-07	134/3.751/9.20e-07	152/3.768/9.66e-07
pen2/160	F/F/F	F/F/F	F/F/F	F/F/F	F/F/F	F/F/F
rosex/500	83/0.855/3.41e-07	44/0.297/9.70e-07	162/1.096/8.53e-07	132/0.476/6.23e-07	99/0.413/6.37e-07	138/0.438/8.77e-07
rosex/1000	51/1.600/1.66e-07	51/1.133/3.87e-07	111/3.108/3.95e-07	91/1.563/3.27e-07	145/1.986/7.34e-07	148/1.995/3.61e-07
trid/500	114/0.659/7.18e-07	99/0.207/9.35e-07	137/0.596/9.19e-07	53/0.110/6.44e-07	49/0.120/7.95e-07	46/0.111/5.23e-07
trid/8000	130/56.332/7.44e-07	83/24.120/9.27e-07	124/73.827/8.32e-07	92/23.918/5.76e-07	86/22.763/3.79e-07	93/23.539/5.20e-07

Table 3 Numerical results for the second group

Problems(Name/n)	FHTTCGM-N Itr/Tcpu/ $\|g_*\|$	KD Itr/Tcpu/ $\|g_*\|$	HD Itr/Tcpu/ $\|g_*\|$	HZ Itr/Tcpu/ $\|g_*\|$	MTTLS Itr/Tcpu/ $\|g_*\|$
cosine/6000	34/0.079/3.06e-07	52/0.071/7.06e-07	269/0.475/2.35e-07	34/0.063/1.66e-07	206/0.462/5.30e-07
cosine/100000	81/1.172/4.86e-07	88/1.290/4.07e-07	F/F/F	55/0.848/5.13e-07	100/1.484/6.82e-07
cosine/800000	38/5.732/5.82e-07	115/14.196/6.02e-07	F/F/F	146/19.226/8.18e-07	1098/134.110/2.90e-07
dixmaana/6000	15/0.204/6.15e-07	23/0.178/8.36e-09	24/0.156/9.02e-07	25/0.166/9.97e-07	20/0.159/3.60e-08
dixmaana/90000	23/2.107/8.53e-07	26/2.231/1.55e-07	23/2.180/6.81e-07	19/2.097/1.60e-07	27/2.259/4.04e-07
dixmaanb/24000	16/0.604/5.95e-07	23/0.616/1.16e-07	16/0.581/5.79e-07	23/0.638/4.76e-07	23/0.624/9.97e-07
dixmaanb/48000	16/1.054/6.66e-07	15/1.077/6.14e-07	18/1.110/1.94e-07	18/1.137/5.18e-07	24/1.210/7.61e-07
dixmaanc/2700	16/0.098/5.42e-07	23/0.068/6.19e-07	22/0.073/4.29e-07	23/0.064/8.28e-07	26/0.095/8.37e-07
dixmaanc/27000	16/0.636/1.01e-07	16/0.681/1.29e-07	23/0.703/6.20e-07	21/0.708/1.15e-07	23/0.724/2.09e-07
dixmaand/12000	21/0.394/6.71e-07	22/0.369/5.73e-07	37/0.531/5.23e-07	23/0.333/3.19e-07	29/0.413/8.08e-07
dixmaand/90000	16/2.025/5.55e-07	24/2.291/3.99e-07	20/2.183/3.33e-07	25/2.190/2.08e-07	21/2.176/4.95e-07
dixmaane/2400	394/0.566/8.71e-07	413/0.581/7.56e-07	352/0.314/7.81e-07	492/0.713/8.94e-07	495/0.596/9.75e-07
dixmaane/48000	1189/27.762/7.98e-07	1419/35.018/8.75e-07	1460/22.594/9.82e-07	F/F/F	1680/39.621/9.84e-07
dixmaanf/15000	823/6.698/7.84e-07	1152/9.869/8.71e-07	1213/7.058/6.38e-07	1043/9.973/9.55e-07	728/5.794/7.61e-07
dixmaanf/60000	1465/42.081/8.62e-07	F/F/F	F/F/F	1502/51.275/7.75e-07	F/F/F
dixmaang/12000	682/4.695/9.72e-07	1582/10.867/7.12e-07	1339/6.465/6.92e-07	976/7.448/9.47e-07	1577/10.632/9.24e-07
dixmaang/90000	1871/78.903/7.68e-07	F/F/F	F/F/F	1659/84.358/9.12e-07	F/F/F
dixmaanh/6000	370/1.300/7.80e-07	1115/3.899/5.21e-07	1004/2.653/8.65e-07	445/1.737/7.32e-07	1165/3.952/6.99e-07
dixmaanh/150000	1761/127.902/9.88e-07	F/F/F	F/F/F	F/F/F	1932/142.148/8.38e-07
dixmaani/360	1926/0.563/9.19e-07	1832/0.503/7.65e-07	F/F/F	1890/0.565/9.66e-07	1839/0.459/9.51e-07
dixmaanj/3000	691/1.086/9.34e-07	798/1.240/9.75e-07	F/F/F	803/1.369/9.72e-07	1086/1.613/8.72e-07
dixmaanj/15000	523/4.421/5.75e-07	756/6.445/9.55e-07	714/4.498/9.01e-07	1121/10.780/9.92e-07	759/6.989/9.88e-07
dixmaank/12000	350/2.416/8.03e-07	391/2.965/9.88e-07	889/3.865/7.78e-07	947/7.067/8.18e-07	501/3.756/9.30e-07
dixmaank/120000	1179/66.356/8.95e-07	1147/67.571/9.93e-07	1865/68.530/8.58e-07	1397/91.246/9.27e-07	1099/60.684/8.60e-07
dixmaanl/2400	1161/1.477/9.50e-07	F/F/F	F/F/F	565/0.812/9.93e-07	313/0.462/8.24e-07
dixmaanl/24000	114/1.598/7.30e-07	539/7.185/8.26e-07	677/7.475/9.25e-07	983/14.421/9.25e-07	753/10.282/8.30e-07
dixon3dq/150	1426/0.072/6.75e-07	1955/0.099/9.37e-07	1797/0.077/7.61e-07	1834/0.094/9.57e-07	F/F/F
dqdrtic/9000	75/0.067/2.41e-07	88/0.072/3.31e-07	76/0.064/4.97e-07	123/0.082/7.49e-07	80/0.074/7.65e-07
dqdrtic/90000	61/0.187/8.39e-07	68/0.211/7.56e-07	74/0.228/2.97e-07	89/0.269/3.55e-07	84/0.336/8.27e-07
dqrtic/5000	39/0.192/4.61e-07	50/0.201/6.17e-07	53/0.203/1.88e-07	51/0.214/4.54e-07	150/0.773/2.22e-07
dqrtic/150000	78/9.738/5.10e-07	91/10.334/2.37e-07	120/11.288/5.97e-07	131/13.832/2.20e-07	295/42.970/3.92e-07
edensch/7000	47/0.361/9.06e-07	69/0.883/9.54e-07	54/0.396/5.38e-07	70/0.818/8.76e-07	109/1.289/8.78e-07
edensch/40000	43/1.837/2.17e-07	72/4.343/4.58e-08	80/5.059/7.79e-07	71/3.563/4.75e-07	117/8.923/6.75e-07
edensch/500000	45/21.528/5.73e-07	92/47.886/2.20e-07	143/126.482/8.77e-07	60/34.892/9.66e-07	175/167.327/5.81e-07
eg2/100	476/0.066/7.55e-07	402/0.044/8.17e-07	259/0.023/7.20e-07	1972/0.179/8.98e-07	99/0.013/6.97e-07
fletchcr/1000	83/0.029/8.50e-07	114/0.030/3.61e-07	117/0.032/9.50e-07	130/0.043/9.84e-07	140/0.044/9.76e-07
fletchcr/50000	120/0.859/7.43e-07	181/0.854/6.29e-07	308/2.460/3.99e-07	258/1.865/6.24e-07	321/2.687/1.63e-07
fletchcr/200000	180/3.685/8.63e-08	405/10.131/7.15e-08	237/5.688/4.91e-07	302/6.157/9.01e-07	251/6.866/9.98e-07
freuroth/460	F/F/F	F/F/F	F/F/F	418/0.084/6.94e-07	F/F/F
genrose/10000	298/0.228/3.87e-07	214/0.152/4.25e-07	177/0.131/9.74e-07	384/0.248/9.55e-07	240/0.258/5.39e-07
himmelbg/70000	2/0.110/6.76e-43	2/0.030/6.41e-43	2/0.032/8.56e-43	2/0.031/5.51e-43	2/0.030/3.72e-43
himmelbg/240000	2/0.087/6.53e-07	2/0.089/6.52e-07	2/0.088/6.78e-07	2/0.087/6.37e-07	2/0.091/6.27e-07
liarwhd/6000	106/0.066/9.48e-07	140/0.073/7.46e-07	125/0.083/8.61e-07	235/0.115/3.89e-07	73/0.060/1.02e-07
liarwhd/30000	218/0.463/8.85e-07	135/0.337/5.34e-07	326/0.522/2.35e-07	326/0.694/7.20e-08	118/0.401/4.55e-07
penalty1/4000	39/9.432/8.82e-07	40/9.352/3.93e-07	41/9.789/1.13e-07	43/10.491/6.07e-07	97/21.937/7.82e-07
penalty1/10000	20/27.353/7.61e-07	21/27.904/1.33e-07	19/27.259/3.73e-07	20/25.859/2.19e-07	19/27.066/3.99e-07
quartc/4000	46/0.152/1.73e-07	50/0.155/3.59e-07	50/0.155/9.51e-07	60/0.182/4.85e-07	83/0.299/5.91e-07
quartc/80000	83/4.793/3.25e-07	111/5.949/3.19e-08	112/5.492/6.99e-07	93/5.459/4.53e-07	293/23.450/8.52e-07
quartc/500000	93/39.426/2.96e-07	141/48.583/6.93e-08	164/48.410/5.64e-07	145/53.359/8.54e-07	343/169.688/9.45e-07
tridia/300	543/0.037/6.30e-07	685/0.035/9.94e-07	642/0.026/9.28e-07	1080/0.061/8.66e-07	933/0.073/8.88e-07

Table 4 Numerical results for the second group (continued)

Problems(Name/n)	FHTTCGM-N Itr/Tcpu/ $\|g_*\|$	KD Itr/Tcpu/ $\|g_*\|$	HD Itr/Tcpu/ $\|g_*\|$	HZ Itr/Tcpu/ $\|g_*\|$	MTTLS Itr/Tcpu/ $\|g_*\|$
tridia/2000	1661/0.121/8.54e-07	F/F/F	F/F/F	F/F/F	F/F/F
woods/150000	260/1.373/7.04e-07	279/1.292/9.50e-07	170/0.857/2.49e-07	395/1.685/8.94e-07	215/1.459/7.92e-07
woods/200000	256/1.828/7.71e-07	286/1.785/9.50e-07	154/1.038/5.95e-07	313/2.032/9.84e-07	226/2.249/5.38e-07
bdexp/5000	2/0.051/2.48e-111	2/0.012/2.27e-111	2/0.008/4.63e-111	2/0.004/1.55e-111	2/0.003/1.44e-111
bdexp/50000	2/0.046/2.62e-89	2/0.042/2.50e-89	2/0.044/3.51e-89	2/0.043/2.11e-89	2/0.043/1.93e-89
bdexp/500000	2/0.393/1.55e-120	2/0.397/1.55e-120	2/0.392/1.55e-120	2/0.396/1.54e-120	2/0.395/1.54e-120
exdenschnf/90000	31/0.161/3.04e-07	24/0.123/3.84e-07	34/0.124/7.59e-07	30/0.118/8.03e-07	34/0.193/9.15e-07
exdenschnf/280000	27/0.501/6.84e-07	24/0.539/6.28e-07	32/0.503/1.47e-07	38/0.550/9.57e-07	41/0.762/6.70e-07
exdenschnf/600000	27/1.160/4.33e-07	30/1.316/4.43e-08	26/1.035/2.38e-07	41/1.268/8.68e-07	48/2.086/9.27e-07
exdenschnb/6000	21/0.023/3.61e-07	22/0.007/8.81e-07	20/0.006/6.39e-07	24/0.007/4.88e-07	22/0.007/5.55e-07
exdenschnb/24000	21/0.027/7.22e-07	22/0.037/7.05e-07	22/0.027/1.51e-07	24/0.037/9.77e-07	23/0.031/3.19e-07
exdenschnb/300000	18/0.341/6.66e-07	28/0.362/2.01e-07	28/0.343/1.25e-07	26/0.340/2.71e-07	29/0.380/8.66e-07
genquartic/9000	16/0.084/2.82e-07	19/0.023/3.89e-07	32/0.020/4.21e-07	21/0.019/4.73e-07	17/0.027/6.87e-07
genquartic/90000	16/0.088/3.02e-07	17/0.102/6.60e-07	19/0.118/7.46e-07	19/0.081/9.77e-07	17/0.084/4.07e-07
genquartic/500000	21/0.716/9.07e-07	26/0.843/6.27e-07	39/0.893/9.77e-07	28/0.758/7.40e-07	39/1.205/5.77e-07
biggsb1/300	1233/0.065/7.68e-07	1766/0.088/9.87e-07	1908/0.059/6.95e-07	F/F/F	F/F/F
sine/100000	140/2.239/8.75e-07	278/4.421/2.81e-07	F/F/F	232/3.827/2.63e-07	F/F/F
sine/250000	50/2.380/8.23e-07	174/7.117/7.95e-07	F/F/F	123/4.897/4.34e-07	F/F/F
sine/500000	101/8.314/4.55e-07	185/16.548/4.07e-07	F/F/F	623/51.019/3.46e-07	F/F/F
fletcbv3/100	F/F/F	F/F/F	555/0.064/7.97e-07	F/F/F	F/F/F
nonscomp/5000	50/0.028/8.79e-07	50/0.011/2.92e-07	78/0.015/5.50e-07	67/0.019/6.04e-07	68/0.021/8.67e-07
nonscomp/80000	66/0.221/7.81e-07	116/0.242/9.37e-07	79/0.160/9.81e-07	70/0.171/7.12e-07	78/0.303/8.64e-07
power1/150	1588/0.081/8.62e-07	1922/0.091/8.42e-07	F/F/F	F/F/F	F/F/F
raydan1/500	223/0.020/9.53e-07	250/0.014/6.26e-07	1004/0.040/9.54e-07	345/0.022/5.99e-07	289/0.025/8.32e-07
raydan1/5000	961/0.277/6.58e-07	1294/0.415/9.81e-07	F/F/F	F/F/F	F/F/F
raydan2/2000	14/0.014/5.34e-07	14/0.004/7.01e-07	14/0.004/7.00e-07	14/0.004/7.01e-07	14/0.004/7.01e-07
raydan2/20000	12/0.070/7.05e-07	34/0.114/3.57e-07	12/0.072/7.14e-07	23/0.084/5.47e-07	15/0.065/3.90e-07
raydan2/500000	19/1.325/9.19e-07	65/5.667/5.55e-07	41/2.386/9.35e-07	51/3.866/7.62e-07	31/1.762/5.38e-07
diagonal1/800	803/0.304/9.24e-07	F/F/F	F/F/F	778/0.252/9.21e-07	1799/0.710/9.50e-07
diagonal1/2000	1612/1.070/5.87e-07	F/F/F	1519/1.022/9.60e-07	1123/0.613/9.72e-07	F/F/F
diagonal2/8000	727/0.734/6.89e-07	728/0.693/9.73e-07	622/0.562/7.55e-07	985/1.061/9.66e-07	1584/1.824/7.94e-07
diagonal2/50000	1417/7.520/7.57e-07	F/F/F	1598/7.323/9.30e-07	F/F/F	F/F/F
diagonal3/500	582/0.219/8.07e-07	F/F/F	F/F/F	418/0.082/7.83e-07	1365/0.581/6.41e-07
diagonal3/2000	1231/1.155/9.95e-07	F/F/F	F/F/F	1686/1.435/8.91e-07	F/F/F
bv/2000	88/1.819/9.96e-07	104/2.218/9.13e-07	145/2.221/7.83e-07	96/2.038/9.30e-07	143/3.822/9.09e-07
bv/20000	0/2.584/1.25e-08	0/2.165/1.25e-08	0/2.137/1.25e-08	0/1.397/1.25e-08	0/2.015/1.25e-08
ie/500	15/5.652/7.75e-07	12/3.529/4.08e-07	15/3.579/7.16e-07	21/3.999/3.11e-07	16/3.661/7.12e-07
ie/1500	17/32.955/9.31e-07	17/34.972/9.06e-07	21/37.511/4.11e-07	20/35.932/4.93e-07	17/33.060/1.00e-06
singx/1000	565/4.087/6.29e-07	397/3.094/7.61e-07	309/2.552/8.80e-07	1348/9.061/8.22e-07	336/3.995/9.21e-07
singx/2000	595/12.258/9.91e-07	167/3.815/9.02e-07	388/8.834/2.31e-07	F/F/F	377/14.936/8.05e-07
lin/100	13/0.181/8.86e-07	13/0.060/8.85e-07	13/0.027/8.85e-07	13/0.040/8.85e-07	13/0.059/8.85e-07
lin/1300	22/107.371/7.30e-07	20/99.933/3.25e-07	22/106.474/5.04e-07	22/109.452/7.38e-07	20/95.083/5.65e-07
osb2/11	643/0.551/8.47e-07	635/0.078/9.04e-07	498/0.048/9.26e-07	1320/0.167/9.48e-07	1042/0.184/9.40e-07
pen1/200	151/0.207/5.36e-07	F/F/F	F/F/F	90/0.097/4.01e-07	135/0.098/2.20e-07
pen1/1000	129/3.359/7.58e-07	127/4.475/4.21e-07	108/3.584/8.49e-07	164/5.732/8.44e-07	146/4.469/3.91e-07
pen2/160	F/F/F	518/0.675/2.78e-07	F/F/F	F/F/F	F/F/F
rosex/500	97/0.389/9.82e-07	82/0.330/5.75e-07	118/0.354/4.79e-07	229/0.851/9.35e-07	70/0.345/9.92e-07
rosex/1000	93/1.441/9.20e-07	106/1.533/1.04e-07	130/1.659/5.75e-07	120/1.767/7.54e-07	94/2.387/6.52e-08
trid/500	51/0.229/8.81e-07	44/0.124/4.41e-07	81/0.158/8.83e-07	58/0.137/7.61e-07	70/0.260/8.55e-07
trid/8000	93/23.129/6.16e-07	94/23.776/8.22e-07	107/22.609/8.36e-07	128/35.031/2.56e-07	125/53.282/7.31e-07