TABLE I: Mean and standard deviation of the IGD values obtained by MaOEAIH and other MaOEAs for DTLZ test suit

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
DTLZ1	3	2.3002e−2	5.8918e−1	2.0557e−2	4.8981e−2	2.0558e−2	2.0557e−2	2.0557e−2	2.9228e−2	2.0557e−2	2.0556e−2	2.0214e−2
		(4.20e−4) −	(3.64e−1) −	(3.94e−7) −	(2.32e−2) −	(6.20e−6) −	(6.57e−7) −	(4.91e−7) −	(1.40e−2) −	(1.81e−7) −	(8.92e−8) −	(1.32e−4)
	5	7.9549e−2	7.5436e−1	6.8059e−2	1.9944e−1	6.8060e−2	6.8060e−2	6.8059e−2	8.5187e−2	6.8058e−2	6.8059e−2	6.6017e−2
		(1.58e−3) −	(6.00e−1) −	(1.28e−6) −	(6.93e−2) −	(2.73e−6) −	(1.42e−6) −	(1.90e−6) −	(1.56e−2) −	(1.27e−6) −	(4.73e−7) −	(1.20e−3)
	8	1.4086e−1	6.9820e−1	1.0868e−1	8.4179e−1	1.0870e−1	1.0869e−1	1.0869e−1	1.6198e−1	1.0858e−1	1.0870e−1	1.0977e−1
		(2.55e−3) −	(9.99e−1) −	(9.35e−6) +	(9.71e−1) −	(1.49e−6) +	(1.47e−6) +	(4.90e−6) +	(4.29e−2) −	(3.50e−5) +	(1.32e−4) +	(1.91e−3)
	10	1.7945e−1	4.6919e−1	1.5414e−1	9.6701e+0	1.5416e−1	1.5406e−1	1.6345e−1	2.3380e−1	1.6026e−1	1.5411e−1	1.2806e−1
		(5.39e−3) −	(2.57e−1) −	(1.82e−4) −	(7.53e+0) −	(1.19e−5) −	(4.81e−5) −	(3.57e−2) −	(3.97e−2) −	(2.58e−3) −	(6.28e−5) −	(2.84e−3)
	15	1.9927e−1	8.1833e−1	1.7104e−1	9.3874e+0	1.9532e−1	3.1328e−1	3.4335e−1	3.8975e−1	2.9480e−1	1.8884e−1	1.5804e−1
		(1.76e−2) −	(6.35e−1) −	(1.40e−2) −	(6.78e+0) −	(3.53e−2) −	(5.30e−2) −	(3.36e−2) −	(5.14e−2) −	(3.99e−2) −	(5.11e−5) −	(8.18e−3)
DTLZ2	3	7.6659e−2	1.7095e−1	5.4464e−2	6.6622e−2	5.5213e−2	5.4465e−2	5.4473e−2	5.4600e−2	5.4465e−2	5.4464e−2	5.2470e−2
		(2.75e−3) −	(1.70e−4) −	(4.30e−7) −	(3.10e−3) −	(4.15e−4) −	(5.35e−6) −	(4.95e−5) −	(6.98e−5) −	(3.73e−7) −	(2.44e−7) −	(3.25e−4)
	5	2.3207e−1	2.2244e−1	2.1222e−1	2.3379e−1	2.1222e−1	2.1222e−1	2.1222e−1	2.1261e−1	2.1221e−1	2.1221e−1	1.9912e−1
		(1.82e−3) −	(2.70e−3) −	(1.24e−5) −	(6.79e−3) −	(4.49e−7) −	(1.01e−5) −	(2.40e−5) −	(2.35e−4) −	(2.12e−6) −	(2.41e−7) −	(1.09e−3)
	8	4.0331e−1	4.0810e−1	3.8691e−1	4.2469e−1	3.8698e−1	3.8691e−1	3.8689e−1	3.8745e−1	3.8680e−1	3.8694e−1	3.7412e−1
		(5.44e−3) −	(1.56e−2) −	(2.74e−5) −	(1.05e−2) −	7.10e−4) −	(2.24e−5) −	(3.18e−5) −	(1.06e−3) −	(2.36e−4) −	(4.35e−6) −	(1.85e−3)
	10	5.1565e−1	5.9496e−1	4.9214e−1	5.1793e−1	5.3022e−1	5.0025e−1	5.3869e−1	5.2575e−1	5.1279e−1	5.0027e−1	4.6382e−1
		(4.63e−3) −	(7.87e−2) −	(6.81e−3) −	(8.58e−3) −	(4.21e−3) −	(6.26e−5) −	(4.86e−2) −	(4.41e−3) −	(2.25e−3) −	(3.79e−5) −	(1.47e−3)
	15	6.3427e−1	8.9954e−1	6.8944e−1	6.5098e−1	7.1601e−1	7.0343e−1	7.3739e−1	7.7475e−1	7.0959e−1	6.9665e−1	5.9439e−1
		(2.30e−3) −	(2.25e−1) −	(1.20e−2) −	(8.75e−3) −	(4.94e−3) −	(1.70e−2) −	(1.57e−2) −	(7.50e−3) −	(1.25e−2) −	(2.04e−3) −	(1.72e−3)
DTLZ3	3	1.0680e−1	1.4055e+1	5.4467e−2	9.3161e−2	5.5161e−2	5.4466e−2	5.4466e−2	7.2548e−2	5.4467e−2	5.4466e−2	5.2627e−2
		(1.71e−1) −	(7.17e+0) −	(5.83e−6) −	(2.64e−2) −	(4.47e−4) −	(2.09e−6) −	(3.31e−6) −	(4.31e−2) −	(2.71e−6) −	(3.01e−6) −	(5.09e−4)
	5	2.3362e−1	1.2930e+1	2.1223e−1	4.8878e−1	2.1222e−1	2.1223e−1	2.1223e−1	2.8723e−1	2.1223e−1	2.1223e−1	2.0135e−1
		(2.27e−3) −	(5.89e+0) −	(2.13e−5) −	(1.61e−1) −	(8.42e−6) −	(1.22e−5) −	(1.58e−5) −	(3.91e−2) −	(2.01e−5) −	(1.29e−5) −	(2.42e−3)
	8	4.0724e−1	7.9158e+0	3.8780e−1	1.2177e+2	3.8654e−1	3.9726e−1	4.5425e−1	6.6207e−1	3.9525e−1	3.8700e−1	3.7992e−1
		(7.01e−3) −	(7.00e+0) −	(1.34e−3) −	(5.90e+1) −	(6.17e−4) −	(5.62e−2) −	(1.24e−1) −	(1.18e−1) −	(4.48e−2) −	(7.10e−5) −	(1.70e−2)
	10	5.2073e−1	5.8299e+0	5.2648e−1	3.4219e+2	5.2736e−1	5.2308e−1	6.2697e−1	1.0323e+0	5.1477e−1	5.0028e−1	4.7096e−1
		(6.97e−3) −	(3.40e+0) −	(1.47e−2) −	(8.18e+1) −	(3.88e−3) −	(6.96e−2) −	(1.07e−1) −	(7.73e−2) −	(2.07e−3) −	(6.38e−5) −	(7.82e−3)
	15	6.4530e−1	5.6688e+0	7.1025e−1	3.9497e+2	7.4733e−1	9.4108e−1	8.8547e−1	1.2509e+2	9.4658e−1	6.9364e−1	6.0326e−1
		(6.74e−3) −	(4.61e+0) −	(3.02e−2) −	(8.54e+1) −	(1.15e−1) −	(5.66e−2) −	(3.76e−2) −	(6.72e+1) −	(4.81e−2) −	(6.90e−3) −	(9.66e−3)
DTLZ4	3	2.5758e−1	2.6170e−1	3.2737e−1	9.5071e−2	2.0117e−1	1.0049e−1	7.0705e−2	5.4639e−2	5.4465e−2	5.4464e−2	5.2850e−2
		(2.79e−1) −	(1.69e−1) −	(2.70e−1) −	(1.61e−1) −	(2.27e−1) −	(1.83e−1) −	(8.89e−2) −	(6.83e−5) −	(5.91e−7) −	(8.14e−8) −	(5.48e−4)
	5	3.1876e−1	3.5262e−1	2.3978e−1	2.3028e−1	4.0124e−1	2.1221e−1	2.6914e−1	2.1264e−1	2.1224e−1	2.2668e−1	2.0216e−1
		(1.12e−1) −	(1.89e−1) −	(7.14e−2) −	(7.20e−3) −	(2.56e−1) −	(8.39e−6) −	(1.06e−1) −	(1.12e−4) −	(1.30e−4) −	(7.92e−2) −	(1.68e−3)
	8	4.2631e−1	5.0040e−1	3.8691e−1	4.0648e−1	4.1862e−1	3.8690e−1	4.8405e−1	3.8727e−1	3.8757e−1	4.2918e−1	3.7725e−1
		(4.74e−2) −	(1.06e−1) −	(4.10e−5) −	(4.68e−3) −	(7.33e−2) −	(4.67e−5) −	(8.82e−2) −	(4.77e−4) −	(6.70e−4) −	(5.85e−2) −	(1.80e−3)
	10	5.2890e−1	5.9452e−1	5.0178e−1	5.0993e−1	5.8088e−1	5.0023e−1	5.9734e−1	5.4773e−1	5.1944e−1	5.3510e−1	4.6783e−1
		(4.18e−2) −	(8.89e−2) −	(3.69e−3) −	(8.46e−3) −	(5.62e−2) −	(9.66e−5) −	(6.11e−2) −	(4.10e−3) −	(3.37e−3) −	(5.33e−2) −	(1.32e−3)
	15	6.3760e−1	8.3126e−1	6.8935e−1	6.4356e−1	7.9229e−1	6.9624e−1	7.3558e−1	1.1736e+0	7.1215e−1	7.6129e−1	5.9563e−1
		(9.81e−3) −	(5.19e−2) −	(9.57e−3) −	(3.14e−3) −	(8.17e−2) −	(5.59e−5) −	(3.29e−2) −	(2.71e−1) −	(1.37e−2) −	(4.85e−2) −	(1.84e−3)
DTLZ5	3	1.0147e−2	5.6065e−1	5.3590e−3	9.3519e−3	3.3193e−2	3.2433e−2	1.3032e−2	1.9252e−2	3.6381e−2	6.2392e−2	4.2210e−3
		(1.32e−3) −	(2.00e−1) −	(1.29e−4) −	(8.51e−4) −	(1.88e−3) −	(2.38e−3) −	(1.91e−3) −	(4.81e−3) −	(3.78e−3) −	(9.75e−4) −	(8.02e−5)
	5	6.8633e−2	5.7666e−1	7.3456e−2	2.0967e−1	1.0785e−1	1.8171e−1	1.2853e−1	1.7016e−1	2.2562e−1	2.2250e−1	5.8045e−2
		(1.27e−2) −	(1.57e−1) −	(1.06e−2) −	(6.50e−2) −	(1.93e−2) −	(6.83e−2) −	(3.21e−2) −	(5.96e−2) −	(4.92e−2) −	(6.48e−3) −	(1.30e−2)
	8	3.0729e−1	6.4907e−1	1.0610e−1	2.9358e−1	2.2056e−1	1.9243e−1	2.8523e−1	6.4882e−1	2.3133e−1	6.7860e−1	6.1577e−2
		(6.24e−2) −	(1.35e−1) −	(2.67e−2) −	(7.16e−2) −	(4.43e−2) −	(7.52e−2) −	(8.46e−2) −	(8.73e−2) −	(7.31e−2) −	(7.24e−2) −	(4.07e−2)
	10	3.4242e−1	6.5382e−1	1.1405e−1	3.3401e−1	2.0536e−1	3.1893e−1	2.8319e−1	6.2932e−1	1.8935e−1	2.2252e−1	5.2282e−2
		(6.99e−7) −	(1.34e−1) −	(2.50e−2) −	(6.09e−2) −	(2.92e−2) −	(6.87e−2) −	(7.06e−2) −	(8.58e−2) −	(4.14e−2) −	(5.53e−2) −	(2.45e−2)
	15	3.4242e−1	7.1294e−1	1.1649e−1	6.6227e−1	3.3246e−1	2.4104e−1	3.3693e−1	4.7108e−1	3.2320e−1	5.5025e−1	4.8561e−2
		(9.36e−7) −	(1.55e−5) −	(2.59e−2) −	(2.15e−1) −	(6.75e−2) −	(7.79e−2) −	(8.35e−2) −	(2.60e−1) −	(8.82e−2) −	(2.37e−1) −	(2.60e−2)
DTLZ6	3	9.7762e−3	6.7590e−1	5.0647e−3	4.8163e−3	3.9913e−2	4.6850e−2	1.8017e−2	3.4961e−2	4.7657e−2	1.1437e−1	4.1203e−3
		(1.28e−3) −	(1.92e−1) −	(6.91e−5) −	(2.66e−4) −	(8.48e−4) −	(1.18e−2) −	(2.25e−3) −	(2.64e−3) −	(8.83e−3) −	(1.55e−2) −	(3.94e−5)
	5	8.7059e−2	7.1050e−1	7.6135e−2	3.6079e−1	1.6668e−1	2.9094e−1	3.3918e−1	3.7612e−1	2.5009e−1	2.3351e−1	9.9003e−2
		(1.37e−2) ≈	(2.14e−1) −	(1.19e−2) ≈	(6.18e−2) −	(3.98e−2) −	(8.85e−2) −	(1.22e−1) −	(8.64e−2) −	(9.47e−2) −	(4.63e−2) −	(7.20e−2)
	8	3.3750e−1	8.5039e−1	1.1548e−1	6.2586e−1	3.9543e−1	3.8481e−1	5.1161e−1	7.2314e−1	2.1736e−1	2.7571e−1	4.3107e−2
		(2.68e−2) −	(3.47e−1) −	(2.69e−2) −	(1.34e−1) −	(1.19e−1) −	(9.48e−2) −	(1.88e−1) −	(6.47e−2) −	(6.97e−2) −	(8.12e−2) −	(1.67e−2)
	10	3.4242e−1	7.4058e−1	9.7603e−2	8.1907e−1	4.2196e−1	3.7142e−1	4.3814e−1	6.2729e−1	2.0585e−1	1.9893e−1	4.3281e−2
		(2.76e−7) −	(1.64e−1) −	(2.58e−2) −	(2.40e−1) −	(1.15e−1) −	(8.77e−2) −	(1.68e−1) −	(1.07e−1) −	(4.29e−2) −	(5.54e−2) −	(1.81e−2)
	15	3.4242e−1	7.1829e−1	1.1200e−1	8.6751e−1	6.4578e−1	3.5220e−1	4.9620e−1	6.3851e+0	2.8090e−1	4.0027e−1	3.9805e−2
		(3.27e−7) −	(1.34e−2) −	(2.47e−2) −	(4.00e−1) −	(8.27e−2) −	(1.17e−1) −	(2.06e−1) −	(3.10e+0) −	(7.53e−2) −	(1.99e−1) −	(1.92e−2)
DTLZ7	3	1.1639e−1	1.0551e+0	1.7630e−1	7.5371e−2	2.5084e−1	1.2733e−1	1.0515e−1	1.0330e−1	1.0629e−1	1.0568e−1	5.8012e−2
		(1.20e−1) ≈	(5.37e−1) −	(1.75e−1) −	(5.44e−2) −	(2.06e−1) −	(9.33e−2) −	(8.70e−2) −	(6.55e−2) −	(8.07e−3) −	(8.04e−4) −	(1.17e−3)
	5	3.7999e−1	2.0851e+0	3.5130e−1	3.3279e−1	3.6587e−1	5.3043e−1	3.8596e−1	3.5486e−1	5.1745e−1	5.0890e−1	2.8988e−1
		(1.25e−1) ≈	(1.12e+0) −	(7.86e−3) −	(1.26e−2) −	(1.06e−1) −	(2.51e−2) −	(1.59e−2) −	(5.96e−3) −	(3.11e−2) −	(2.00e−3) −	(7.41e−3)
	8	8.7655e−1	3.6858e+0	1.7965e+0	7.6505e−1	1.1093e+0	1.4518e+0	9.2603e−1	1.2068e+0	2.1489e+0	1.8555e+0	6.8905e−1
		(1.28e−1) −	(2.02e+0) −	(9.54e−2) −	(2.26e−2) −	(3.01e−3) −	(2.12e−1) −	(5.71e−2) −	(1.92e−2) −	(4.73e−1) −	(2.71e−2) −	(4.70e−3)
	10	1.3023e+0	4.4274e+0	3.4997e+0	1.1487e+0	2.1200e+0	1.6480e+0	1.5374e+0	2.5004e+0	2.0873e+0	3.6403e+0	9.4470e−1
		(3.23e−1) −	(2.42e+0) −	(1.22e−1) −	(4.29e−2) −	(1.27e−2) −	(3.07e−1) −	(2.64e−1) −	(3.62e−1) −	(5.37e−1) −	(8.75e−2) −	(9.40e−3)
	15	3.3876e+0	2.8895e+0	7.3830e+0	2.9927e+0	8.2001e+0	1.1100e+1	5.8323e+0	8.9713e+0	7.9929e+0	7.0858e+0	1.5673e+0
		(7.82e−1) −	(3.45e−1) −	(2.95e−1) −	(3.76e−1) −	(1.17e+0) −	(5.45e−1) −	(7.05e−1) −	(7.69e−1) −	(5.57e−1) −	(3.08e−1) −	(1.25e−2)
+/−/≈		0/32/3	0/35/0	1/33/1	0/35/0	1/34/0	1/34/0	1/34/0	0/35/0	1/34/0	1/34/0	

TABLE II: Mean and standard deviation of the IGD values obtained by MaOEAIH and other MaOEAs for WFG test suit

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
WFG1	3	1.6193e−1	2.2889e+0	1.4413e−1	1.7811e−1	1.4501e−1	1.3939e−1	1.4544e−1	1.5679e−1	1.4209e−1	1.4769e−1	1.6019e−1
		(4.11e−3) −	(5.86e−2) −	(2.90e−3) +	(7.03e−3) −	(1.65e−3) +	(1.89e−3) +	(2.65e−3) +	(6.43e−3) ≈	(1.62e−3) +	(3.85e−3) +	(9.75e−3)
	5	6.2547e−1	3.3256e+0	4.7412e−1	5.1344e−1	4.6317e−1	4.4298e−1	4.7336e−1	5.5745e−1	4.7704e−1	4.4786e−1	4.8527e−1
		(2.37e−2) −	(6.60e−1) −	(3.39e−3) ≈	(1.23e−2) −	(4.54e−3) +	(4.05e−3) +	(2.96e−3) ≈	(2.43e−2) −	(1.34e−3) ≈	(9.79e−3) +	(2.61e−2)
	8	1.3562e+0	6.5126e+0	1.0263e+0	1.0397e+0	1.6722e+0	1.0103e+0	1.0090e+0	1.4171e+0	9.9490e−1	1.2372e+0	9.7039e−1
		(6.24e−2) −	(2.90e+0) −	(8.78e−3) −	(5.01e−2) −	(1.05e−1) −	(3.08e−2) −	(7.39e−2) −	(7.47e−2) −	(4.14e−2) −	(1.51e−1) −	(7.27e−2)
	10	1.8482e+0	8.7759e+0	1.2866e+0	1.2401e+0	1.8211e+0	1.2908e+0	1.3556e+0	1.8517e+0	1.4422e+0	1.3652e+0	1.1551e+0
		(1.01e−1) −	(4.18e+0) −	(6.45e−3) −	(5.39e−2) −	(2.79e−1) −	(4.81e−2) −	(1.58e−1) −	(8.23e−2) −	(9.15e−2) −	(1.04e−1) −	(1.08e−1)
	15	2.7299e+0	1.4265e+1	2.0345e+0	1.8654e+0	3.5698e+0	2.1642e+0	2.1321e+0	3.2245e+0	2.1556e+0	2.2719e+0	1.8531e+0
		(1.84e−1) −	(5.48e+0) −	(1.60e−2) −	(9.79e−2) ≈	(3.56e−1) −	(8.82e−2) −	(1.90e−1) −	(1.78e−1) −	(1.12e−1) −	(6.85e−2) −	(2.24e−1)
WFG2	3	2.2818e−1	1.5063e+0	1.6514e−1	1.9085e−1	1.5562e−1	1.5829e−1	1.6579e−1	1.7406e−1	1.7102e−1	1.7397e−1	1.6935e−1
		(1.23e−2) −	(1.71e−1) −	(9.65e−4) +	(9.70e−3) −	(1.78e−3) +	(1.09e−3) +	(8.71e−4) +	(5.93e−3) −	(2.64e−3) −	(2.21e−3) −	(4.53e−3)
	5	6.2982e−1	1.9751e+0	5.0745e−1	5.7658e−1	4.9581e−1	4.7278e−1	5.0899e−1	5.8217e−1	5.1887e−1	4.7875e−1	5.4737e−1
		(1.62e−2) −	(4.48e−1) −	(1.90e−3) +	(2.20e−2) −	(8.45e−3) +	(9.01e−4) +	(1.28e−3) +	(2.06e−2) −	(1.32e−2) +	(6.66e−3) +	(2.53e−2)
	8	1.3590e+0	2.9085e+0	1.0883e+0	1.1590e+0	1.8655e+0	1.8210e+0	1.1630e+0	1.3896e+0	1.1242e+0	1.2923e+0	1.0628e+0
		(3.14e−2) −	(6.77e−1) −	(1.49e−2) −	(4.81e−2) −	(3.15e−1) −	(4.34e−1) −	(1.31e−1) −	(7.90e−2) −	(5.92e−2) −	(3.14e−2) −	(3.56e−2)
	10	1.9126e+0	5.3011e+0	1.3547e+0	1.3466e+0	2.1929e+0	3.3610e+0	1.5274e+0	1.9081e+0	1.4514e+0	1.5087e+0	1.3360e+0
		(8.28e−2) −	(3.06e+0) −	(1.50e−2) ≈	(4.93e−2) ≈	(1.85e−1) −	(5.00e−1) −	(1.25e−1) −	(7.27e−2) −	(8.69e−2) −	(1.22e−2) −	(7.83e−2)
	15	2.2712e+0	8.2560e+0	2.0633e+0	1.9147e+0	3.4293e+0	9.2874e+0	2.2390e+0	3.4713e+0	3.9870e+0	2.3463e+0	2.1733e+0
		(2.15e−1) ≈	(6.56e+0) −	(3.19e−2) ≈	(1.40e−1) +	(3.84e−1) −	(2.14e+0) −	(4.07e−1) ≈	(1.42e−1) −	(9.25e−1) −	(9.20e−3) −	(2.57e−1)
WFG3	3	6.4201e−2	3.1817e+0	1.1622e−1	9.6020e−2	7.1260e−2	1.2970e−1	9.9251e−2	1.3271e−1	1.2460e−1	2.2287e−1	5.3865e−2
		(5.14e−3) −	(2.62e−2) −	(7.35e−3) −	(7.57e−3) −	(7.99e−3) −	(1.80e−2) −	(1.00e−2) −	(2.31e−2) −	(9.23e−3) −	(6.59e−3) −	(2.43e−3)
	5	3.8656e−1	5.4261e+0	6.8676e−1	4.8682e−1	5.2535e−1	6.3846e−1	5.9978e−1	7.3887e−1	6.4743e−1	7.1141e−1	3.4749e−1
		(6.02e−2) −	(3.46e−2) −	(4.84e−2) −	(6.57e−2) −	(3.57e−2) −	(2.76e−2) −	(4.61e−2) −	(1.31e−1) −	(4.34e−2) −	(3.34e−2) −	(3.82e−2)
	8	1.0664e+0	8.8757e+0	2.1489e+0	1.1213e+0	1.8901e+0	1.8506e+0	2.0713e+0	2.6711e+0	1.3349e+0	2.4152e+0	1.0756e+0
		(1.87e−1) ≈	(5.35e−2) −	(2.19e−1) −	(1.79e−1) ≈	(9.97e−2) −	(5.14e−1) −	(3.63e−1) −	(3.54e−1) −	(3.02e−1) −	(2.91e−1) −	(1.45e−1)
	10	1.6166e+0	1.1191e+1	3.3693e+0	1.5355e+0	2.6049e+0	2.6522e+0	3.2713e+0	3.2899e+0	2.2716e+0	3.4125e+0	1.6532e+0
		(2.27e−1) ≈	(4.28e−2) −	(1.83e−1) −	(3.09e−1) +	(1.60e−1) −	(8.88e−1) −	(9.04e−1) −	(4.59e−1) −	(4.56e−1) −	(7.03e−2) −	(2.87e−1)
	15	3.1522e+0	1.6905e+1	6.4406e+0	4.2682e+0	7.2867e+0	4.3628e+0	4.8299e+0	9.5269e+0	4.7111e+0	7.7079e+0	4.2414e+0
		(9.23e−1) +	(1.16e−1) −	(9.06e−1) −	(1.03e+0) ≈	(2.33e−1) −	(5.15e−1) ≈	(5.34e−1) −	(5.92e−1) −	(7.22e−1) −	(5.29e−1) −	(9.47e−1)
WFG4	3	3.0289e−1	3.9407e+0	2.2087e−1	2.5531e−1	2.2286e−1	2.2087e−1	2.2088e−1	2.2120e−1	2.2091e−1	2.2115e−1	2.0439e−1
		(9.74e−3) −	(3.52e−1) −	(5.52e−6) −	(7.79e−3) −	(2.17e−3) −	(3.53e−6) −	(5.20e−6) −	(2.81e−4) −	(8.05e−6) −	(3.92e−4) −	(9.38e−4)
	5	1.4128e+0	6.2788e+0	1.2250e+0	1.3312e+0	1.2251e+0	1.2250e+0	1.2250e+0	1.2246e+0	1.2262e+0	1.2265e+0	1.1131e+0
		(2.58e−2) −	(5.76e−1) −	(5.38e−5) −	(2.58e−2) −	(2.38e−4) −	(7.87e−5) −	(8.48e−5) −	(1.11e−3) −	(5.41e−4) −	(1.47e−3) −	(3.25e−3)
	8	3.5379e+0	9.8145e+0	3.5275e+0	3.7036e+0	3.5330e+0	3.5223e+0	3.5245e+0	3.5439e+0	3.5609e+0	3.5070e+0	3.1575e+0
		(5.03e−2) −	(1.22e+0) −	(4.60e−3) −	(3.86e−2) −	(7.99e−3) −	(1.11e−3) −	(2.61e−3) −	(1.14e−2) −	(8.29e−3) −	(1.54e−2) −	(1.19e−2)
	10	5.3858e+0	1.3135e+1	5.8687e+0	5.5692e+0	6.1211e+0	5.8596e+0	5.8630e+0	6.0045e+0	5.9145e+0	5.8428e+0	4.8125e+0
		(1.15e−1) −	(2.36e+0) −	(9.87e−3) −	(5.60e−2) −	(8.34e−2) −	(2.83e−3) −	(8.76e−3) −	(7.56e−2) −	(1.02e−2) −	(9.88e−2) −	(1.75e−2)
	15	9.5276e+0	2.5029e+1	1.2041e+1	9.8008e+0	1.2717e+1	1.2005e+1	1.2046e+1	1.3242e+1	1.2033e+1	1.2846e+1	9.4634e+0
		(1.28e−1) −	(3.56e+0) −	(5.39e−2) −	(1.61e−1) −	(2.86e−1) −	(1.28e−2) −	(1.50e−1) −	(8.73e−2) −	(1.77e−1) −	(4.37e−1) −	(4.05e−2)
WFG5	3	3.0568e−1	7.9349e−1	2.2987e−1	2.6106e−1	2.3104e−1	2.2987e−1	2.2987e−1	2.2995e−1	2.3038e−1	2.3000e−1	2.1185e−1
		(1.10e−2) −	(5.61e−1) −	(1.53e−6) −	(8.48e−3) −	(9.04e−4) −	(2.74e−6) −	(3.01e−6) −	(2.11e−4) −	(5.65e−4) −	(1.90e−4) −	(8.05e−4)
	5	1.4110e+0	6.2667e+0	1.2153e+0	1.3180e+0	1.2153e+0	1.2153e+0	1.2153e+0	1.2128e+0	1.2260e+0	1.2158e+0	1.0979e+0
		(2.17e−2) −	(1.05e+0) −	(1.28e−5) −	(3.10e−2) −	(1.11e−5) −	(6.27e−6) −	(6.98e−6) −	(9.91e−4) −	(1.38e−2) −	(5.65e−4) −	(2.30e−3)
	8	3.5491e+0	1.2887e+1	3.5269e+0	3.6291e+0	3.5353e+0	3.5279e+0	3.5279e+0	3.5281e+0	3.5736e+0	3.5029e+0	3.1670e+0
		(4.11e−2) −	(2.35e+0) −	(2.40e−3) −	(4.86e−2) −	(5.66e−3) −	(6.29e−5) −	(1.10e−4) −	(7.00e−3) −	(2.04e−2) −	(9.38e−3) −	(1.03e−2)
	10	5.4190e+0	1.6466e+1	5.8128e+0	5.6028e+0	6.0313e+0	5.8201e+0	5.8202e+0	5.8801e+0	6.1714e+0	5.7981e+0	4.8047e+0
		(1.27e−1) −	(2.86e+0) −	(9.76e−3) −	(7.35e−2) −	(5.73e−2) −	(3.78e−4) −	(4.81e−4) −	(3.89e−2) −	(9.44e−2) −	(2.23e−2) −	(1.67e−2)
	15	9.6080e+0	2.7812e+1	1.1868e+1	9.7740e+0	1.2225e+1	1.1940e+1	1.1858e+1	1.3101e+1	1.2031e+1	1.1433e+1	9.4201e+0
		(1.45e−1) −	(2.94e+0) −	(1.08e−1) −	(2.06e−1) −	(1.16e−1) −	(4.25e−2) −	(1.99e−1) −	(1.67e−1) −	(1.69e−1) −	(2.28e−1) −	(4.92e−2)
WFG6	3	3.1686e−1	2.7652e+0	2.3496e−1	2.8993e−1	2.3938e−1	2.3985e−1	2.3973e−1	2.4285e−1	2.3350e−1	2.3507e−1	2.2220e−1
		(1.00e−2) −	(1.32e+0) −	(6.97e−3) −	(1.28e−2) −	(1.03e−2) −	(9.96e−3) −	(6.30e−3) −	(1.09e−2) −	(9.31e−3) −	(9.90e−3) −	(8.22e−3)
	5	1.4186e+0	5.6896e+0	1.2141e+0	1.3565e+0	1.2145e+0	1.2143e+0	1.2141e+0	1.2135e+0	1.2154e+0	1.2151e+0	1.1104e+0
		(2.21e−2) −	(1.28e+0) −	(7.88e−4) −	(2.74e−2) −	(1.20e−3) −	(9.53e−4) −	(6.59e−4) −	(1.36e−3) −	(3.56e−3) −	(1.24e−3) −	(2.81e−3)
	8	3.6292e+0	9.4138e+0	3.5314e+0	3.7446e+0	3.5499e+0	3.5331e+0	3.5343e+0	3.5507e+0	3.5500e+0	3.5917e+0	3.1677e+0
		(4.00e−2) −	(5.08e+0) −	(5.58e−3) −	(6.51e−2) −	(9.71e−3) −	(4.85e−3) −	(5.48e−3) −	(1.98e−2) −	(5.77e−3) −	(4.60e−2) −	(1.12e−2)
	10	5.7019e+0	8.9150e+0	5.7876e+0	5.7204e+0	6.2010e+0	5.8043e+0	5.9921e+0	6.1258e+0	5.8571e+0	6.0978e+0	4.8138e+0
		(7.86e−2) −	(4.77e+0) −	(2.11e−2) −	(1.64e−1) −	(1.03e−1) −	(1.26e−2) −	(4.02e−1) −	(8.12e−2) −	(2.01e−2) −	(1.71e−1) −	(1.83e−2)
	15	9.7708e+0	2.1076e+1	1.2015e+1	9.8130e+0	1.2828e+1	1.1914e+1	1.2149e+1	1.3583e+1	1.1948e+1	1.3026e+1	9.4432e+0
		(2.06e−1) −	(9.56e+0) −	(1.97e−1) −	(2.97e−1) −	(2.43e−1) −	(2.24e−2) −	(3.25e−1) −	(8.88e−2) −	(1.93e−1) −	(3.72e−1) −	(5.11e−2)
WFG7	3	3.0883e−1	2.5716e+0	2.2090e−1	2.4510e−1	2.2377e−1	2.2089e−1	2.2089e−1	2.2210e−1	2.2089e−1	2.2102e−1	2.0772e−1
		(1.09e−2) −	(8.79e−1) −	(2.00e−5) −	(9.66e−3) −	(1.87e−3) −	(5.98e−6) −	(1.12e−5) −	(6.09e−4) −	(7.17e−6) −	(4.74e−5) −	(1.60e−3)
	5	1.4338e+0	5.8209e+0	1.2264e+0	1.3361e+0	1.2268e+0	1.2258e+0	1.2258e+0	1.2236e+0	1.2292e+0	1.2310e+0	1.1227e+0
		(1.93e−2) −	(6.87e−1) −	(6.14e−4) −	(3.38e−2) −	(1.39e−3) −	(3.82e−4) −	(4.73e−4) −	(1.36e−3) −	(2.82e−3) −	(3.30e−3) −	(4.49e−3)
	8	3.6012e+0	1.0736e+1	3.5337e+0	3.6375e+0	3.5473e+0	3.5317e+0	3.5712e+0	3.5536e+0	3.5958e+0	3.7109e+0	3.1924e+0
		(4.61e−2) −	(2.21e+0) −	(7.85e−3) −	(4.56e−2) −	(8.32e−3) −	(1.04e−2) −	(1.47e−1) −	(2.41e−2) −	(1.01e−2) −	(7.60e−2) −	(1.51e−2)
	10	5.5732e+0	1.3798e+1	5.8842e+0	5.3773e+0	6.2353e+0	5.8722e+0	5.8878e+0	6.0813e+0	5.9478e+0	6.1690e+0	4.8348e+0
		(7.52e−2) −	(2.05e+0) −	(5.82e−2) −	(7.47e−2) −	(8.07e−2) −	(1.11e−2) −	(5.55e−2) −	(5.42e−2) −	(1.30e−2) −	(1.12e−1) −	(2.11e−2)
	15	9.4888e+0	2.4122e+1	1.1706e+1	9.6734e+0	1.2620e+1	1.1999e+1	1.2092e+1	1.3522e+1	1.3495e+1	1.2719e+1	9.4874e+0
		(9.16e−2) ≈	(2.35e+0) −	(1.97e−1) −	(1.89e−1) −	(1.98e−1) −	(4.97e−2) −	(1.87e−1) −	(2.17e−1) −	(1.64e+0) −	(3.35e+0) −	(7.57e−2)
WFG8	3	3.5120e−1	3.6732e+0	2.6394e−1	3.3744e−1	2.7339e−1	2.7335e−1	2.7298e−1	3.0022e−1	2.8369e−1	2.8151e−1	2.5585e−1
		(1.16e−2) −	(2.22e−1) −	(2.38e−3) −	(7.43e−3) −	(2.79e−3) −	(3.63e−3) −	(3.01e−3) −	(5.79e−3) −	(4.60e−3) −	(4.30e−3) −	(3.09e−3)
	5	1.3516e+0	5.4034e+0	1.2219e+0	1.4122e+0	1.2263e+0	1.2415e+0	1.2335e+0	1.2312e+0	1.3374e+0	1.2391e+0	1.1468e+0
		(1.82e−2) −	(1.80e+0) −	(8.11e−4) −	(2.13e−2) −	(4.21e−3) −	(1.06e−2) −	(1.25e−2) −	(2.91e−3) −	(2.08e−2) −	(8.98e−3) −	(4.82e−3)
	8	3.5232e+0	1.2010e+1	3.5985e+0	3.6962e+0	3.7501e+0	3.5812e+0	3.7342e+0	3.6797e+0	3.5799e+0	3.9253e+0	3.2796e+0
		(2.89e−2) −	(2.30e+0) −	(2.52e−2) −	(5.64e−2) −	(2.45e−2) −	(2.02e−2) −	(2.35e−1) −	(1.92e−2) −	(8.73e−2) −	(1.10e−1) −	(2.06e−2)
	10	5.4949e+0	1.4874e+1	5.8950e+0	5.9109e+0	6.0394e+0	5.7271e+0	6.0165e+0	6.0662e+0	5.8898e+0	6.0830e+0	4.9222e+0
		(1.30e−1) −	(1.62e+0) −	(1.12e−1) −	(3.13e−1) −	(4.94e−2) −	(5.37e−2) −	(1.57e−1) −	(7.04e−2) −	(1.31e−1) −	(1.97e−1) −	(7.27e−2)
	15	9.5207e+0	2.7044e+1	1.2005e+1	1.0051e+1	1.2947e+1	1.2310e+1	1.2123e+1	1.2947e+1	1.3031e+1	1.2232e+1	9.6363e+0
		(1.97e−1) +	(2.49e+0) −	(3.82e−1) −	(4.81e−1) −	(1.10e−1) −	(4.41e−1) −	(3.54e−1) −	(1.71e−1) −	(3.77e−1) −	(4.36e−1) −	(1.09e−1)
WFG9	3	2.9857e−1	2.0939e+0	2.2051e−1	2.4227e−1	2.2183e−1	2.2040e−1	2.2067e−1	2.2204e−1	2.2989e−1	2.2110e−1	2.0074e−1
		(1.31e−2) −	(5.41e−1) −	(3.46e−4) −	(1.11e−2) −	(1.49e−3) −	(2.70e−4) −	(3.44e−4) −	(1.02e−3) −	(2.56e−3) −	(7.70e−4) −	(1.10e−3)
	5	1.3648e+0	4.8164e+0	1.2149e+0	1.3120e+0	1.2154e+0	1.2142e+0	1.2142e+0	1.2088e+0	1.3605e+0	1.2188e+0	1.1053e+0
		(3.28e−2) −	(1.16e+0) −	(2.98e−3) −	(1.78e−2) −	(2.37e−3) −	(1.98e−3) −	(2.17e−3) −	(7.61e−3) −	(1.94e−2) −	(2.92e−3) −	(5.05e−3)
	8	3.4308e+0	1.1188e+1	3.5357e+0	3.5503e+0	3.5501e+0	3.5144e+0	3.5652e+0	3.5868e+0	3.5581e+0	3.5116e+0	3.2215e+0
		(2.95e−2) −	(3.66e+0) −	(1.21e−2) −	(6.53e−2) −	(1.57e−2) −	(1.24e−2) −	(1.13e−1) −	(2.52e−2) −	(7.68e−2) −	(2.23e−2) −	(2.34e−2)
	10	5.1881e+0	1.5208e+1	5.8126e+0	5.4102e+0	5.8813e+0	5.8293e+0	5.8418e+0	5.9208e+0	6.2385e+0	5.8113e+0	4.8333e+0
		(1.03e−1) −	(3.96e+0) −	(1.26e−2) −	(6.29e−2) −	(4.54e−2) −	(3.65e−2) −	(9.05e−2) −	(6.67e−2) −	(7.58e−2) −	(6.54e−2) −	(3.98e−2)
	15	9.1811e+0	2.6112e+1	1.1596e+1	9.0363e+0	1.2039e+1	1.1938e+1	1.1739e+1	1.2775e+1	1.1632e+1	1.1303e+1	9.5022e+0
		(8.81e−2) +	(6.40e+0) −	(2.78e−1) −	(2.14e−1) +	(5.57e−2) −	(2.68e−1) −	(3.58e−1) −	(2.35e−1) −	(5.73e−1) −	(4.38e−1) −	(1.06e−1)
+/−/≈		3/38/4	0/45/0	3/39/3	3/38/4	4/41/0	4/40/1	3/40/2	0/44/1	2/42/1	3/42/0	

TABLE III: Mean and standard deviation of the IGD values obtained by MaOEAIH and other MaOEAs for MAF and IDTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
MaF1	3	4.4589e−2	1.6193e−1	4.3539e−2	4.5739e−2	7.0720e−2	8.0826e−2	6.1067e−2	7.1340e−2	7.7803e−2	8.2142e−2	4.0410e−2
		(7.02e−4) −	(4.61e−4) −	(1.88e−4) −	(3.35e−3) −	(2.29e−4) −	(1.10e−3) −	(1.85e−3) −	(7.89e−4) −	(3.69e−4) −	(1.28e−4) −	(1.19e−4)
	5	1.4909e−1	2.9193e−1	1.4860e−1	1.3444e−1	2.2812e−1	5.8844e−1	2.2763e−1	2.1666e−1	2.5535e−1	4.3712e−1	1.3113e−1
		(2.18e−3) −	(6.66e−3) −	(3.24e−3) −	(2.47e−3) −	(5.69e−4) −	(1.75e−1) −	(2.28e−2) −	(2.75e−3) −	(2.04e−2) −	(1.32e−1) −	(3.24e−4)
	8	2.6383e−1	3.7260e−1	2.6524e−1	2.2823e−1	3.4513e−1	3.2485e−1	3.1302e−1	3.5083e−1	4.5968e−1	6.6904e−1	2.1862e−1
		(4.45e−3) −	(4.01e−3) −	(1.34e−3) −	(4.17e−3) −	(6.30e−3) −	(1.29e−2) −	(9.41e−3) −	(1.10e−2) −	(7.70e−3) −	(7.73e−2) −	(3.14e−4)
	10	3.2051e−1	3.7113e−1	3.0245e−1	2.7964e−1	3.4325e−1	3.6306e−1	3.2084e−1	3.5632e−1	4.7007e−1	7.1447e−1	2.5467e−1
		(7.39e−3) −	(1.85e−2) −	(5.18e−4) −	(5.98e−3) −	(5.91e−3) −	(1.65e−2) −	(7.00e−3) −	(1.20e−2) −	(1.87e−2) −	(7.94e−2) −	(8.22e−4)
	15	4.0021e−1	4.0315e−1	4.4023e−1	4.2066e−1	4.1330e−1	3.9415e−1	3.7413e−1	4.6409e−1	5.8125e−1	7.7056e−1	3.0401e−1
		(1.29e−2) −	(2.36e−2) −	(5.41e−2) −	(2.72e−2) −	(1.35e−2) −	(2.10e−2) −	(9.05e−3) −	(2.80e−2) −	(2.38e−2) −	(7.80e−2) −	(9.35e−4)
MaF2	3	3.1420e−2	2.7048e−1	3.3238e−2	3.3427e−2	3.6444e−2	3.6442e−2	3.6025e−2	4.6275e−2	3.7112e−2	4.0009e−2	2.9211e−2
		(6.16e−4) −	(1.77e−1) −	(7.82e−4) −	(1.16e−3) −	(1.08e−4) −	(3.93e−4) −	(5.80e−4) −	(2.22e−3) −	(4.15e−4) −	(4.04e−4) −	(3.27e−4)
	5	1.2926e−1	1.4906e−1	1.2189e−1	1.3926e−1	1.3592e−1	1.4441e−1	1.4210e−1	1.4811e−1	1.4724e−1	1.4576e−1	1.1828e−1
		(3.80e−3) −	(5.18e−2) −	(1.44e−3) −	(4.47e−3) −	(8.44e−4) −	(2.70e−3) −	(4.62e−3) −	(1.27e−3) −	(5.33e−3) −	(9.43e−4) −	(1.40e−3)
	8	2.0269e−1	3.9577e−1	2.0042e−1	1.7723e−1	1.8077e−1	2.0928e−1	2.4265e−1	1.8381e−1	2.3934e−1	5.0894e−1	1.7210e−1
		(9.85e−3) −	(1.99e−2) −	(4.48e−3) −	(5.34e−3) −	(1.64e−3) −	(1.10e−2) −	(2.22e−2) −	(8.56e−4) −	(2.01e−2) −	(2.26e−1) −	(2.41e−3)
	10	2.3948e−1	4.1771e−1	2.4284e−1	2.0945e−1	2.1012e−1	3.0614e−1	2.9337e−1	2.1506e−1	2.5383e−1	6.5393e−1	1.9873e−1
		(3.11e−2) −	(1.83e−2) −	(1.01e−2) −	(8.95e−3) −	(2.19e−3) −	(3.21e−2) −	(3.09e−2) −	(1.89e−3) −	(1.89e−2) −	(1.80e−1) −	(2.57e−3)
	15	4.1890e−1	4.2886e−1	3.8133e−1	2.2218e−1	2.2375e−1	5.3500e−1	3.1896e−1	2.4045e−1	6.8898e−1	8.4207e−1	2.3376e−1
		(1.44e−2) −	(2.32e−2) −	(3.51e−2) −	(5.99e−3) +	(5.34e−4) +	(8.95e−2) −	(4.29e−2) −	(8.18e−3) −	(3.62e−2) −	(3.45e−2) −	(4.78e−3)
MaF3	3	4.0278e−2	2.6135e+2	4.6488e−2	1.4866e−1	3.9784e−2	5.0037e−2	4.6409e−2	1.4308e−1	4.6358e−2	5.9056e−2	3.1995e−2
		(1.18e−3) −	(2.12e+2) −	(6.26e−5) −	(8.11e−2) −	(2.75e−4) −	(4.00e−5) −	(6.58e−5) −	(7.62e−2) −	(1.66e−5) −	(6.89e−2) −	(2.71e−4)
	5	9.0986e−2	3.6916e+1	9.8598e−2	1.6351e−1	8.0785e−2	1.1019e−1	9.8562e−2	1.7801e−1	9.8640e−2	8.1630e−2	8.3555e−2
		(2.80e−3) −	(5.48e+1) −	(2.42e−4) −	(8.90e−2) −	(2.21e−3) +	(1.35e−4) −	(1.73e−4) −	(4.69e−2) −	(5.74e−5) −	(5.39e−3) ≈	(2.51e−3)
	8	1.4587e−1	2.8851e+1	1.4150e−1	1.7050e+7	1.6639e−1	3.1120e−1	1.4098e−1	5.6779e+5	1.8414e−1	1.1020e−1	1.2158e−1
		(5.93e−3) −	(4.81e+1) −	(8.17e−4) −	(1.65e+7) −	(4.59e−3) −	(2.95e−1) −	(1.34e−3) −	(2.06e+6) −	(4.29e−2) −	(2.27e−2) +	(1.11e−2)
	10	1.7262e−1	5.0830e+1	1.2118e−1	3.8097e+7	1.7522e−1	4.6567e−1	1.3959e−1	3.1849e+6	2.2786e−1	9.9087e−2	1.3119e−1
		(3.49e−2) −	(1.23e+2) −	(1.10e−3) +	(6.61e+7) −	(6.77e−3) −	(3.27e−1) −	(7.10e−2) −	(1.07e+7) −	(5.98e−2) −	(5.33e−3) +	(9.68e−3)
	15	1.1687e−1	3.3237e+1	1.2708e−1	1.4779e+8	1.8336e−1	7.9379e−1	9.5947e−1	2.8111e+8	3.6519e−1	1.2223e−1	1.5026e−1
		(7.68e−3) +	(3.61e+1) −	(5.06e−3) +	(3.96e+8) −	(1.31e−2) −	(1.94e−1) −	(4.19e−1) −	(1.44e+9) −	(1.54e−1) −	(4.97e−3) +	(1.16e−2)
MaF4	3	3.2256e−1	8.2167e+0	3.3946e−1	5.0913e−1	3.3922e−1	3.2337e−1	3.4369e−1	4.1327e−1	3.8067e−1	4.1322e−1	2.4795e−1
		(1.36e−2) −	(7.32e+0) −	(1.80e−3) −	(1.41e−1) −	(5.21e−3) −	(1.44e−2) −	(1.64e−2) −	(3.62e−2) −	(2.02e−2) −	(9.68e−2) −	(1.32e−2)
	5	2.4349e+0	4.4789e+1	2.9880e+0	3.0122e+0	2.8725e+0	4.1436e+0	3.6192e+0	3.4602e+0	4.0326e+0	4.4791e+0	1.9693e+0
		(6.12e−2) −	(3.93e+1) −	(2.17e−1) −	(3.49e−1) −	(5.11e−2) −	(5.71e−1) −	(5.97e−1) −	(3.97e−1) −	(2.85e−1) −	(1.21e+0) −	(1.18e−2)
	8	1.7440e+1	2.0899e+2	3.0201e+1	2.4243e+1	3.2914e+1	4.0393e+1	3.5157e+1	3.9342e+1	4.5481e+1	5.9446e+1	1.6887e+1
		(1.12e+0) −	(2.47e+1) −	(2.02e+0) −	(3.21e+0) −	(2.01e+0) −	(6.83e+0) −	(1.94e+0) −	(1.70e+0) −	(5.51e+0) −	(1.59e+1) −	(1.16e+0)
	10	6.9016e+1	9.6578e+2	1.4429e+2	9.0901e+1	1.4009e+2	1.7957e+2	1.5104e+2	1.4396e+2	1.5426e+2	2.2986e+2	6.7293e+1
		(5.74e+0) ≈	(2.81e+2) −	(1.73e+1) −	(1.15e+1) −	(3.63e+0) −	(1.48e+1) −	(1.43e+1) −	(3.48e+0) −	(1.67e+1) −	(4.85e+1) −	(3.96e+0)
	15	2.2534e+3	8.4171e+4	7.0742e+3	1.9856e+3	5.3771e+3	5.6267e+3	5.6718e+3	5.7033e+3	8.2495e+3	9.5027e+3	2.4019e+3
		(2.66e+2) ≈	(6.24e+4) −	(1.24e+3) −	(1.73e+2) +	(3.24e+2) −	(3.50e+2) −	(3.04e+2) −	(2.44e+2) −	(1.48e+3) −	(2.50e+3) −	(3.69e+2)
MaF5	3	1.1069e+0	1.5570e+0	1.1028e+0	3.0491e−1	1.2017e+0	3.1915e−1	6.8605e−1	2.6041e−1	2.5976e−1	3.0117e−1	2.3366e−1
		(1.22e+0) −	(7.17e−1) −	(1.28e+0) −	(1.05e−2) −	(1.45e+0) −	(3.25e−1) −	(1.23e+0) −	(6.03e−4) −	(2.32e−6) −	(2.27e−1) −	(2.44e−3)
	5	3.3244e+0	5.9378e+0	2.4997e+0	2.6747e+0	3.6409e+0	2.3735e+0	2.5887e+0	2.3758e+0	2.3744e+0	3.0815e+0	2.0173e+0
		(1.41e+0) −	(2.25e+0) −	(6.36e−1) −	(9.58e−2) −	(2.01e+0) −	(6.12e−4) −	(7.22e−1) −	(6.73e−3) −	(2.05e−3) −	(1.31e+0) −	(1.84e−2)
	8	2.1506e+1	4.2269e+1	2.8482e+1	2.5879e+1	2.7974e+1	2.8236e+1	2.8240e+1	2.7799e+1	2.7748e+1	2.9877e+1	1.6225e+1
		(5.13e+0) −	(6.69e+0) −	(3.53e−1) −	(1.40e+0) −	(3.29e+0) −	(1.18e−2) −	(1.25e−2) −	(4.03e−1) −	(3.84e−1) −	(3.81e+0) −	(5.46e−1)
	10	8.4867e+1	2.9783e+2	1.6678e+2	9.9406e+1	1.2346e+2	1.3717e+2	1.3719e+2	1.4085e+2	1.4021e+2	1.3191e+2	6.7021e+1
		(1.08e+1) −	(3.70e+1) −	(7.02e+0) −	(4.24e+0) −	(1.62e+1) −	(1.63e−1) −	(1.24e−1) −	(3.70e+0) −	(1.67e+0) −	(1.70e+1) −	(9.68e+0)
	15	2.4997e+3	7.3234e+3	5.8753e+3	2.4692e+3	3.6731e+3	4.8127e+3	4.8128e+3	5.3679e+3	4.9498e+3	6.6090e+3	1.9825e+3
		(3.78e+2) −	(1.02e+1) −	(2.72e+2) −	(1.56e+2) −	(4.74e+2) −	(2.10e+0) −	(1.77e+0) −	(5.18e+2) −	(7.16e+1) −	(1.02e+3) −	(1.30e+2)
MaF6	3	9.6296e−3	6.7058e−1	5.1340e−3	2.1063e−2	3.9256e−2	3.6147e−2	1.6365e−2	3.3861e−2	3.7227e−2	3.5524e−2	4.0351e−3
		(9.80e−4) −	(1.05e−1) −	(1.33e−4) −	(1.68e−2) −	(1.32e−3) −	(5.04e−3) −	(2.00e−3) −	(4.05e−3) −	(1.10e−2) −	(1.42e−3) −	(2.98e−5)
	5	9.8685e−3	6.8324e−1	5.0810e−3	9.5572e−3	7.9791e−2	1.4659e−1	6.4773e−2	6.5538e−2	1.0936e−1	8.1554e−2	4.0852e−3
		(1.13e−3) −	(3.92e−2) −	(6.43e−5) −	(3.16e−3) −	(3.61e−3) −	(2.11e−2) −	(2.32e−2) −	(1.01e−2) −	(2.41e−2) −	(1.30e−2) −	(4.26e−5)
	8	7.6379e−2	7.0808e−1	6.3019e−3	1.1661e+0	1.2281e−1	1.5180e−1	9.8934e−2	1.2153e−1	1.6648e−1	5.1535e−1	4.4796e−3
		(1.35e−1) −	(2.64e−2) −	(3.27e−4) −	(2.11e+0) −	(1.77e−2) −	(6.94e−2) −	(9.28e−2) −	(1.02e−2) −	(3.04e−2) −	(2.76e−1) −	(1.72e−3)
	10	1.6526e−1	7.1319e−1	9.4521e−3	4.2598e+0	1.3389e−1	2.3817e−1	3.3317e−1	2.6595e−1	1.8880e−1	1.3144e−1	3.8410e−2
		(1.69e−1) −	(2.08e−2) −	(4.58e−3) ≈	(5.96e+0) −	(3.27e−2) −	(7.35e−2) −	(1.63e−1) −	(1.45e−1) −	(3.57e−2) −	(4.26e−4) −	(7.24e−2)
	15	3.0914e−1	7.1299e−1	4.8725e−2	4.3895e+1	2.7436e−1	2.6753e−1	4.8570e−1	3.2419e−1	3.5369e−1	5.9375e−1	9.4281e−2
		(1.01e−1) −	(1.44e−4) −	(2.19e−2) ≈	(1.40e+1) −	(5.82e−2) −	(7.32e−2) −	(1.96e−1) −	(3.88e−2) −	(6.42e−2) −	(2.03e−1) −	(9.07e−2)
MaF7	3	1.0716e−1	9.0481e−1	1.7478e−1	8.4633e−2	1.5811e−1	1.2992e−1	8.3291e−2	1.0379e−1	1.0695e−1	1.0532e−1	5.7637e−2
		(1.12e−1) ≈	(5.05e−1) −	(2.55e−1) −	(7.28e−2) −	(1.25e−1) −	(9.26e−2) −	(1.15e−2) −	(6.57e−2) −	(6.70e−3) −	(2.68e−4) −	(1.19e−3)
	5	3.5717e−1	1.9242e+0	3.4645e−1	3.3247e−1	5.8827e−1	5.2898e−1	3.8270e−1	3.5593e−1	5.1688e−1	5.0918e−1	2.8967e−1
		(1.19e−1) ≈	(1.15e+0) −	(5.48e−3) −	(1.24e−2) −	(5.25e−1) −	(2.48e−2) −	(1.84e−2) −	(5.67e−3) −	(2.62e−2) −	(4.06e−4) −	(7.14e−3)
	8	8.2739e−1	3.8206e+0	1.8084e+0	7.6402e−1	1.1242e+0	1.4042e+0	9.4509e−1	1.2123e+0	2.0829e+0	1.8280e+0	6.8838e−1
		(9.91e−2) −	(1.99e+0) −	(5.17e−2) −	(2.43e−2) −	(7.83e−2) −	(2.52e−1) −	(5.63e−2) −	(2.21e−2) −	(4.77e−1) −	(1.41e−1) −	(3.61e−3)
	10	1.2774e+0	4.4074e+0	3.4751e+0	1.1649e+0	2.1207e+0	1.7420e+0	1.4517e+0	2.6453e+0	1.9900e+0	3.6522e+0	9.4205e−1
		(2.90e−1) −	(2.45e+0) −	(1.23e−1) −	(4.87e−2) −	(1.23e−2) −	(4.31e−1) −	(2.54e−1) −	(3.66e−1) −	(4.10e−1) −	(2.48e−2) −	(9.65e−3)
	15	3.2246e+0	3.1876e+0	7.3758e+0	3.1881e+0	8.0627e+0	1.1100e+1	5.5466e+0	8.9916e+0	8.1645e+0	7.1575e+0	1.5692e+0
		(8.03e−1) −	(1.70e+0) −	(3.24e−1) −	(4.81e−1) −	(8.23e−1) −	(5.49e−1) −	(7.45e−1) −	(5.99e−1) −	(4.66e−1) −	(1.73e−1) −	(1.29e−2)
MaF8	3	6.5136e−2	5.7543e−1	7.6668e−2	3.2656e−1	2.2909e−1	1.9392e−1	1.0978e−1	1.4783e−1	1.3977e−1	1.4060e−1	6.8220e−2
		(1.37e−3) +	(2.21e−1) −	(2.29e−3) −	(7.15e−2) −	(3.40e−1) −	(5.80e−2) −	(6.21e−3) −	(1.26e−2) −	(1.67e−2) −	(7.85e−3) −	(1.32e−3)
	5	1.1554e−1	7.4477e−1	1.3856e−1	2.9493e−1	2.6330e−1	4.1522e−1	2.4183e−1	2.4935e−1	3.6984e−1	4.6734e−1	1.1122e−1
		(2.63e−3) −	(1.56e−1) −	(5.35e−3) −	(8.79e−2) −	(2.79e−1) −	(2.10e−2) −	(2.03e−2) −	(2.11e−2) −	(1.21e−2) −	(5.08e−2) −	(1.50e−3)
	8	1.5862e−1	1.3575e+0	2.1529e−1	2.7348e−1	2.7587e−1	7.1531e−1	4.2764e−1	2.7966e−1	9.0911e−1	9.7908e−1	1.4661e−1
		(3.88e−3) −	(2.98e−1) −	(1.01e−2) −	(6.40e−2) −	(2.35e−3) −	(1.01e−1) −	(6.06e−2) −	(1.47e−2) −	(8.66e−2) −	(1.09e−1) −	(1.48e−3)
	10	1.7711e−1	1.4657e+0	2.4192e−1	2.6768e−1	4.0508e−1	1.0347e+0	4.7339e−1	4.5049e−1	8.7934e−1	1.1321e+0	1.6333e−1
		(3.83e−3) −	(2.22e−1) −	(5.78e−3) −	(3.04e−2) −	(2.78e−2) −	(1.47e−1) −	(8.40e−2) −	(5.30e−2) −	(1.66e−1) −	(1.37e−1) −	(1.51e−3)
	15	2.1556e−1	2.0019e+0	5.0385e−1	2.9653e−1	5.6157e−1	1.4715e+0	8.3483e−1	5.9553e−1	1.2557e+0	1.5852e+0	1.9907e−1
		(2.73e−3) −	(2.60e−1) −	(3.61e−2) −	(2.74e−2) −	(5.58e−2) −	(1.77e−1) −	(1.20e−1) −	(5.38e−2) −	(1.65e−1) −	(2.16e−1) −	(1.40e−3)
MaF9	3	6.9543e−2	7.8781e−1	6.2000e−2	3.9419e−1	6.1988e−2	6.1992e−2	6.1992e−2	4.2021e−1	6.6023e−2	6.1989e−2	6.0692e−2
		(1.70e−3) −	(3.55e−1) −	(6.87e−5) −	(9.01e−2) −	(9.42e−6) −	(9.09e−7) −	(1.42e−6) −	(5.71e−2) −	(5.74e−4) −	(2.33e−6) −	(3.71e−4)
	5	1.1501e−1	9.2055e−1	1.4580e−1	6.3419e−1	1.5849e−1	8.1010e−1	5.1264e−1	6.1751e−1	3.8870e−1	4.2101e−1	1.0781e−1
		(1.77e−3) −	(4.21e−1) −	(7.93e−3) −	(2.06e−1) −	(1.34e−2) −	(2.22e−1) −	(1.73e−1) −	(1.93e−1) −	(5.96e−2) −	(9.85e−2) −	(3.67e−3)
	8	1.5656e−1	1.2707e+0	2.5974e−1	5.9011e+0	2.2230e−1	1.2268e+0	1.4115e+0	2.3992e+0	5.4955e−1	9.9538e−1	1.0777e+0
		(1.90e−3) +	(5.69e−1) ≈	(1.24e−2) +	(3.35e+0) −	(2.16e−2) +	(8.88e−1) ≈	(1.29e+0) ≈	(2.00e+0) −	(8.11e−2) +	(2.29e−1) ≈	(3.87e−1)
	10	1.8424e−1	1.7338e+0	3.2110e−1	8.7172e+1	4.6984e−1	1.0978e+0	1.4812e+0	1.2997e+0	7.3699e−1	1.3284e+0	1.8774e+0
		(3.03e−3) +	(9.56e−1) ≈	(2.44e−2) +	(9.31e+1) −	(1.81e−2) +	(1.24e−1) +	(1.42e+0) +	(3.65e−1) +	(1.08e−1) +	(4.13e−1) +	(8.67e−1)
	15	2.2086e−1	7.0181e+0	5.1097e−1	1.2434e+0	1.1867e+0	1.8377e+0	1.2187e+0	1.8914e+0	1.3581e+0	2.9038e+0	2.2225e−1
		(3.24e−3) +	(5.39e+0) −	(3.82e−2) −	(2.16e+0) −	(2.21e−1) −	(5.11e−1) −	(3.67e−1) −	(2.10e+0) −	(2.11e−1) −	(3.17e+0) −	(5.23e−2)

(*continued on next page*)

(*continued*)

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
MaF10	3	1.6083e−1	2.2668e+0	1.4481e−1	1.7954e−1	1.4533e−1	1.3968e−1	1.4443e−1	1.5625e−1	1.4183e−1	1.4543e−1	1.6109e−1
		(5.83e−3) ≈	(1.33e−1) −	(2.73e−3) +	(8.67e−3) −	(1.59e−3) +	(1.52e−3) +	(2.77e−3) +	(8.00e−3) ≈	(1.49e−3) +	(3.31e−3) +	(1.30e−2)
	5	6.3411e−1	3.3187e+0	4.7436e−1	5.1466e−1	4.6253e−1	4.4383e−1	4.7400e−1	5.5099e−1	4.7681e−1	4.4681e−1	4.9232e−1
		(2.22e−2) −	(6.97e−1) −	(4.28e−3) +	(1.06e−2) −	(3.96e−3) +	(6.51e−3) +	(2.63e−3) +	(1.81e−2) −	(1.51e−3) +	(4.88e−3) +	(2.93e−2)
	8	1.3554e+0	7.0777e+0	1.0190e+0	1.0313e+0	1.6900e+0	1.0099e+0	9.8555e−1	1.4458e+0	9.9164e−1	1.2782e+0	9.6382e−1
		(6.54e−2) −	(2.38e+0) −	(8.65e−3) −	(3.41e−2) −	(1.49e−1) −	(5.90e−2) −	(1.31e−2) −	(7.46e−2) −	(3.35e−2) −	(1.46e−1) −	(6.04e−2)
	10	1.8399e+0	7.4322e+0	1.2879e+0	1.2321e+0	1.8072e+0	1.2771e+0	1.4072e+0	1.8886e+0	1.4397e+0	1.3768e+0	1.1363e+0
		(8.68e−2) −	(3.32e+0) −	(8.26e−3) −	(4.06e−2) −	(2.99e−1) −	(2.91e−2) −	(1.98e−1) −	(1.28e−1) −	(1.08e−1) −	(8.33e−2) −	(7.75e−2)
	15	2.7222e+0	1.2930e+1	2.0356e+0	1.8694e+0	3.5118e+0	2.2123e+0	2.2439e+0	3.2306e+0	2.1757e+0	2.2723e+0	1.8487e+0
		(2.04e−1) −	(6.94e+0) −	(1.38e−2) −	(1.41e−1) ≈	(3.96e−1) −	(1.42e−1) −	(2.94e−1) −	(1.95e−1) −	(1.33e−1) −	(5.80e−2) −	(2.17e−1)
MaF11	3	2.2847e−1	1.5486e+0	1.6505e−1	1.8917e−1	1.5604e−1	1.5822e−1	1.6571e−1	1.7475e−1	1.7007e−1	1.7288e−1	1.6920e−1
		(1.67e−2) −	(2.05e−1) −	(9.61e−4) +	(7.73e−3) −	(2.10e−3) +	(1.04e−3) +	(9.78e−4) +	(5.42e−3) −	(8.49e−4) ≈	(2.35e−3) −	(3.02e−3)
	5	6.2698e−1	1.9458e+0	5.0795e−1	5.7631e−1	4.9422e−1	4.7303e−1	5.0902e−1	5.7551e−1	5.1830e−1	4.7977e−1	5.5237e−1
		(1.25e−2) −	(2.91e−1) −	(1.87e−3) +	(1.79e−2) −	(7.10e−3) +	(9.91e−4) +	(8.47e−4) +	(2.18e−2) −	(1.55e−2) +	(7.72e−3) +	(2.26e−2)
	8	1.3644e+0	2.6011e+0	1.0845e+0	1.1719e+0	1.7865e+0	1.8763e+0	1.1840e+0	1.3816e+0	1.1378e+0	1.2964e+0	1.0539e+0
		(3.87e−2) −	(4.24e−1) −	(7.90e−3) −	(5.54e−2) −	(2.84e−1) −	(4.85e−1) −	(1.62e−1) −	(4.96e−2) −	(6.70e−2) −	(3.19e−2) −	(3.13e−2)
	10	1.9412e+0	5.0873e+0	1.3509e+0	1.3622e+0	2.2929e+0	2.9055e+0	1.5484e+0	1.9005e+0	1.4622e+0	1.5024e+0	1.3252e+0
		(8.07e−2) −	(3.83e+0) −	(4.09e−3) ≈	(6.15e−2) −	(1.26e−1) −	(9.03e−1) −	(1.65e−1) −	(6.54e−2) −	(1.21e−1) −	(1.23e−2) −	(7.77e−2)
	15	2.3155e+0	7.7070e+0	2.0512e+0	1.8981e+0	3.7182e+0	8.6313e+0	2.1190e+0	3.5141e+0	3.6591e+0	2.3468e+0	2.2457e+0
		(2.34e−1) ≈	(7.35e+0) −	(3.99e−2) +	(8.76e−2) +	(6.49e−1) −	(2.37e+0) −	(2.91e−1) ≈	(1.48e−1) −	(8.64e−1) −	(8.47e−3) ≈	(3.29e−1)
MaF12	3	3.0004e−1	2.1917e+0	2.2036e−1	2.4711e−1	2.2985e−1	2.2052e−1	2.2060e−1	2.3069e−1	2.2950e−1	2.2088e−1	2.0103e−1
		(8.98e−3) −	(5.69e−1) −	(2.77e−4) −	(1.25e−2) −	(2.98e−2) −	(2.32e−4) −	(3.11e−4) −	(3.05e−2) −	(2.89e−3) −	(4.04e−4) −	(1.33e−3)
	5	1.3610e+0	4.6976e+0	1.2141e+0	1.3040e+0	1.2161e+0	1.2139e+0	1.2141e+0	1.2071e+0	1.3625e+0	1.2192e+0	1.1060e+0
		(2.52e−2) −	(1.27e+0) −	(1.86e−3) −	(2.75e−2) −	(3.13e−3) −	(1.93e−3) −	(3.30e−3) −	(5.49e−3) −	(2.41e−2) −	(2.80e−3) −	(4.80e−3)
	8	3.4289e+0	1.1109e+1	3.5311e+0	3.5798e+0	3.5495e+0	3.5251e+0	3.5300e+0	3.5821e+0	3.5514e+0	3.5220e+0	3.2251e+0
		(4.36e−2) −	(2.66e+0) −	(1.04e−2) −	(7.75e−2) −	(1.45e−2) −	(1.72e−2) −	(2.27e−2) −	(3.10e−2) −	(2.34e−2) −	(2.51e−2) −	(2.48e−2)
	10	5.1842e+0	1.5212e+1	5.8112e+0	5.4063e+0	5.8747e+0	5.8312e+0	5.8400e+0	5.9181e+0	6.2083e+0	5.8335e+0	4.8281e+0
		(8.16e−2) −	(4.37e+0) −	(2.43e−2) −	(7.75e−2) −	(3.62e−2) −	(3.87e−2) −	(6.73e−2) −	(5.82e−2) −	(8.01e−2) −	(4.62e−2) −	(3.34e−2)
	15	9.1462e+0	2.5515e+1	1.1592e+1	9.0284e+0	1.2052e+1	1.1962e+1	1.1780e+1	1.2766e+1	1.1784e+1	1.1221e+1	9.4846e+0
		(9.54e−2) +	(7.06e+0) −	(3.17e−1) −	(2.76e−1) +	(5.67e−2) −	(1.88e−1) −	(2.88e−1) −	(2.39e−1) −	(5.67e−1) −	(4.32e−1) −	(1.08e−1)
MaF13	3	8.5605e−2	6.0225e−1	6.4233e−2	1.6172e−1	6.3039e−2	6.0801e−2	6.6688e−2	1.3238e−1	6.8878e−2	6.2834e−2	7.8803e−2
		(2.64e−3) −	(2.41e−1) −	(4.53e−3) +	(2.93e−2) −	(2.00e−3) +	(2.77e−3) +	(3.83e−3) +	(1.64e−2) −	(4.48e−3) +	(2.79e−3) +	(9.13e−3)
	5	1.0720e−1	7.9455e−1	1.4219e−1	2.3378e−1	1.8322e−1	4.4621e−1	3.0315e−1	3.8182e−1	3.1489e−1	4.3114e−1	1.0062e−1
		(8.39e−3) −	(7.92e−2) −	(5.83e−3) −	(1.96e−2) −	(1.02e−2) −	(5.95e−2) −	(4.49e−2) −	(1.09e−1) −	(2.84e−2) −	(2.69e−2) −	(7.51e−3)
	8	1.2289e−1	1.1440e+0	1.9096e−1	2.4200e−1	4.2561e−1	6.4498e−1	4.5439e−1	1.0589e+0	5.9450e−1	1.2387e+0	1.2225e−1
		(9.13e−3) ≈	(5.81e−2) −	(9.26e−3) −	(3.13e−2) −	(3.49e−2) −	(9.33e−2) −	(9.60e−2) −	(6.40e−1) −	(1.40e−1) −	(1.28e+0) −	(9.42e−3)
	10	1.2992e−1	1.2571e+0	2.2303e−1	2.7483e−1	5.5895e−1	7.3375e−1	4.2797e−1	1.9093e+0	1.0169e+0	1.0651e+0	1.2907e−1
		(8.66e−3) ≈	(1.54e−1) −	(1.94e−2) −	(1.98e−2) −	(5.25e−2) −	(9.08e−2) −	(1.03e−1) −	(3.59e+0) −	(1.90e−1) −	(2.48e−1) −	(6.95e−3)
	15	1.4160e−1	1.6269e+0	4.0537e−1	2.7067e−1	7.6555e−1	1.2150e+0	8.2086e−1	1.7355e+0	1.4065e+0	5.3653e+0	1.5057e−1
		(5.95e−3) +	(2.38e−1) −	(3.84e−2) −	(2.56e−2) −	(1.32e−1) −	(2.20e−1) −	(1.95e−1) −	(3.02e−1) −	(1.09e−1) −	(2.16e+1) −	(1.12e−2)
IDTLZ1	3	2.2388e−2	1.2345e−1	2.1744e−2	7.5295e−2	3.5132e−2	4.0429e−2	3.0990e−2	3.5932e−2	3.8869e−2	4.4658e−2	1.9962e−2
		(4.07e−4) −	(9.25e−2) −	(2.29e−5) −	(5.75e−2) −	(4.34e−5) −	(5.11e−4) −	(1.17e−3) −	(4.25e−4) −	(2.47e−4) −	(1.04e−2) −	(1.15e−4)
	5	7.4181e−2	1.7459e−1	7.5202e−2	7.5026e−2	1.1631e−1	3.7727e−1	9.8713e−2	1.0568e−1	1.2878e−1	1.5959e−1	6.7092e−2
		(9.47e−4) −	(1.18e−1) −	(1.78e−3) −	(1.66e−2) −	(3.02e−3) −	(7.77e−2) −	(3.46e−3) −	(2.79e−3) −	(1.06e−2) −	(2.13e−2) −	(4.98e−4)
	8	1.3140e−1	3.0139e−1	1.3253e−1	1.1949e−1	1.8263e−1	1.6467e−1	1.5578e−1	1.7573e−1	2.6989e−1	2.7704e−1	1.1839e−1
		(1.96e−3) −	(1.39e−1) −	(1.36e−3) −	(1.10e−2) ≈	(6.18e−2) −	(4.27e−3) −	(3.45e−3) −	(5.38e−3) −	(1.32e−2) −	(3.06e−2) −	(5.88e−3)
	10	1.5695e−1	3.5220e−1	1.5101e−1	1.3847e−1	2.2153e−1	1.9160e−1	1.6460e−1	1.8900e−1	2.8916e−1	3.2031e−1	1.2784e−1
		(2.76e−3) −	(1.57e−1) −	(7.36e−4) −	(7.58e−3) −	(1.17e−1) −	(1.05e−2) −	(5.69e−3) −	(1.33e−2) −	(8.22e−3) −	(4.26e−2) −	(2.40e−3)
	15	1.9501e−1	4.4624e−1	2.2088e−1	2.1303e−1	2.3610e−1	2.0667e−1	1.9088e−1	1.9751e−1	3.5219e−1	3.6402e−1	1.7252e−1
		(5.23e−3) ≈	(1.22e−1) −	(1.49e−2) −	(1.31e−2) −	(9.71e−2) −	(3.03e−2) −	(7.00e−3) ≈	(1.07e−2) −	(1.64e−2) −	(4.65e−2) −	(2.69e−2)
IDTLZ2	3	7.3682e−2	3.3274e−1	7.7457e−2	7.0847e−2	7.4857e−2	7.2105e−2	7.4025e−2	8.1145e−2	8.3395e−2	7.9669e−2	5.2057e−2
		(3.40e−3) −	(4.66e−3) −	(8.10e−5) −	(6.76e−3) −	(1.19e−3) −	(1.09e−3) −	(2.36e−3) −	(1.87e−3) −	(2.63e−3) −	(9.04e−4) −	(2.67e−4)
	5	2.3643e−1	4.9316e−1	2.3953e−1	2.2586e−1	2.5570e−1	3.3392e−1	2.8038e−1	2.7264e−1	3.3470e−1	3.6306e−1	1.9750e−1
		(4.17e−3) −	(1.53e−2) −	(5.07e−3) −	(1.01e−2) −	(3.51e−3) −	(2.67e−2) −	(1.42e−2) −	(2.03e−3) −	(1.99e−2) −	(1.09e−2) −	(1.03e−3)
	8	4.1933e−1	7.6873e−1	5.2711e−1	4.4145e−1	6.3207e−1	6.3923e−1	5.7896e−1	6.5265e−1	7.1084e−1	7.7445e−1	3.7413e−1
		(4.61e−3) −	(9.53e−3) −	(1.33e−2) −	(2.35e−2) −	(1.20e−2) −	(1.03e−2) −	(1.28e−2) −	(3.59e−3) −	(2.29e−2) −	(4.68e−2) −	(1.67e−3)
	10	4.7855e−1	7.9123e−1	5.2540e−1	5.3070e−1	7.2351e−1	7.5591e−1	6.9218e−1	7.3831e−1	7.5370e−1	7.4956e−1	4.5602e−1
		(3.50e−3) −	(2.43e−2) −	(1.22e−2) −	(3.29e−2) −	(1.25e−2) −	(1.25e−2) −	(1.54e−2) −	(3.19e−3) −	(2.15e−2) −	(1.82e−2) −	(2.00e−3)
	15	5.9912e−1	8.8669e−1	7.3698e−1	6.2477e−1	8.3192e−1	8.6624e−1	8.4872e−1	8.6286e−1	1.0123e+0	9.3189e−1	5.9153e−1
		(6.01e−3) −	(7.19e−4) −	(1.80e−2) −	(3.54e−2) −	(8.77e−3) −	(1.48e−2) −	(1.08e−2) −	(4.41e−3) −	(4.48e−2) −	(2.67e−2) −	(2.57e−3)
+/−/≈		7/59/9	0/73/2	10/62/3	4/69/2	9/66/0	6/68/1	6/66/3	1/73/1	6/67/1	8/64/3	

TABLE IV: Mean and standard deviation of the DeltaP values obtained by MaOEAIH and other MaOEAs for DTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	2.2934e-2	6.1257e-1	2.0557e-2	1.7953e-1	2.0558e-2	2.0557e-2	2.0557e-2	1.2540e-1	2.0557e-2	2.0556e-2	2.0206e-2
		(5.08e-4) −	(4.03e-1) −	(2.24e-7) −	(3.16e-1) −	(6.20e-6) −	(2.95e-7) −	(2.00e-7) −	(2.92e-1) −	(3.12e-7) −	(1.39e-7) −	(1.51e-4)
DTLZ1	5	7.9189e-2	6.9827e-1	6.8059e-2	6.3436e-1	6.8060e-2	6.8060e-2	6.8060e-2	6.2220e-1	6.8058e-2	6.8059e-2	6.5810e-2
		(2.19e-3) −	(7.60e-1) −	(8.47e-7) −	(8.74e-1) −	(2.73e-6) −	(2.91e-6) −	(2.24e-6) −	(9.20e-1) −	(1.00e-6) −	(9.76e-7) −	(6.24e-4)
	8	1.4010e-1	9.7061e-1	1.0869e-1	8.1383e+1	1.0870e-1	1.0869e-1	1.0869e-1	2.4038e+0	1.0857e-1	1.0868e-1	1.0927e-1
		(3.70e-3) −	(8.37e-1) −	(6.96e-6) +	(4.36e+1) −	(1.49e-6) +	(4.24e-6) +	(4.00e-6) +	(3.07e+0) −	(2.84e-5) +	(2.92e-5) +	(1.44e-4)
	10	1.7850e-1	6.0144e-1	1.5413e-1	1.7253e+2	1.5416e-1	1.5405e-1	1.5414e-1	6.5976e+0	1.5885e-1	1.5413e-1	1.2763e-1
		(5.07e-3) −	(4.69e-1) −	(6.72e-5) −	(1.90e+1) −	(1.19e-5) −	(3.76e-5) −	(3.72e-5) −	(6.53e+0) −	(2.39e-3) −	(5.49e-5) −	(1.98e-3)
	15	1.9927e-1	1.2279e+0	1.7104e-1	1.8904e+2	1.9532e-1	1.2761e+0	7.1071e+0	2.0677e+1	1.0828e+0	1.8884e-1	1.5804e-1
		(1.76e-2) −	(1.29e+0) −	(1.40e-2) −	(1.23e+1) −	(3.53e-2) −	(1.58e+0) −	(5.65e+0) −	(1.58e+1) −	(1.48e+0) −	(5.11e-5) −	(8.18e-3)
	3	7.7019e-2	1.7087e-1	5.4464e-2	6.6464e-2	5.5213e-2	5.4466e-2	5.4466e-2	5.4600e-2	5.4465e-2	5.4464e-2	5.2580e-2
		(3.12e-3) −	(7.98e-5) −	(1.37e-7) −	(3.11e-3) −	(4.15e-4) −	(6.39e-6) −	(8.54e-6) −	(6.98e-5) −	(3.47e-7) −	(4.66e-8) −	(4.05e-4)
DTLZ2	5	2.3333e-1	2.2289e-1	2.1222e-1	2.3270e-1	2.1222e-1	2.1221e-1	2.1222e-1	2.1261e-1	2.1221e-1	2.1221e-1	1.9896e-1
		(2.54e-3) −	(3.30e-3) −	(1.50e-5) −	(5.84e-3) −	(4.49e-7) −	(1.09e-5) −	(2.71e-5) −	(2.35e-4) −	(2.13e-6) −	(1.67e-7) −	(8.28e-4)
	8	4.0283e-1	4.0264e-1	3.8692e-1	4.2205e-1	3.8698e-1	3.8691e-1	4.1607e-1	3.8745e-1	3.8681e-1	3.8694e-1	3.7434e-1
		(5.23e-3) −	(6.24e-3) −	(2.98e-5) −	(7.86e-3) −	(7.10e-4) −	(2.48e-5) −	(4.76e-2) −	(1.06e-3) −	(1.81e-4) −	(3.88e-6) −	(1.24e-3)
	10	5.1483e-1	6.1444e-1	4.9391e-1	5.2022e-1	5.3022e-1	5.0026e-1	5.2820e-1	5.2575e-1	5.1283e-1	5.0026e-1	4.6428e-1
		(4.01e-3) −	(9.39e-2) −	(7.47e-3) −	(1.05e-2) −	(4.21e-3) −	(5.25e-5) −	(4.18e-2) −	(4.41e-3) −	(2.34e-3) −	(4.58e-5) −	(1.52e-3)
	15	6.3427e-1	8.9954e-1	6.8944e-1	6.5098e-1	7.1601e-1	7.0343e-1	7.3739e-1	7.7475e-1	7.0959e-1	6.9665e-1	5.9439e-1
		(2.30e-3) −	(2.25e-1) −	(1.20e-2) −	(8.75e-3) −	(4.94e-3) −	(1.70e-2) −	(1.57e-2) −	(7.50e-3) −	(1.25e-2) −	(2.04e-3) −	(1.72e-3)
	3	7.4434e-2	1.3554e+1	5.4466e-2	4.9197e-1	5.5161e-2	5.4466e-2	5.4466e-2	3.4302e-1	5.4467e-2	5.4465e-2	5.2466e-2
		(2.34e-3) −	(7.05e+0) −	(2.98e-6) −	(8.81e-1) −	(4.47e-4) −	(1.55e-6) −	(2.56e-6) −	(5.88e-1) −	(1.44e-6) −	(1.52e-6) −	(3.73e-4)
DTLZ3	5	2.3290e-1	1.7024e+1	2.1232e-1	2.7608e+0	2.1222e-1	2.1223e-1	2.1223e-1	1.0157e+1	2.1223e-1	2.1223e-1	2.0368e-1
		(2.35e-3) −	(8.86e+0) −	(2.94e-4) −	(3.60e+0) −	(8.42e-6) −	(1.53e-5) −	(1.79e-5) −	(7.45e+0) −	(2.64e-5) −	(2.02e-5) −	(1.04e-2)
	8	4.0664e-1	1.5578e+1	3.8917e-1	6.7278e+2	3.8654e-1	1.6244e+0	4.9378e+0	6.0576e+1	3.8701e-1	3.8698e-1	3.7793e-1
		(7.96e-3) −	(9.09e+0) −	(7.31e-3) −	(8.79e+1) −	(6.17e-4) −	(5.56e+0) −	(9.79e+0) −	(2.33e+1) −	(2.30e-4) −	(3.83e-5) −	(7.97e-3)
	10	5.2243e-1	1.5450e+1	5.2845e-1	9.7810e+2	5.2736e-1	1.6240e+0	1.9414e+1	1.8551e+2	5.2056e-1	5.0027e-1	4.7014e-1
		(6.94e-3) −	(1.05e+1) −	(1.89e-2) −	(9.98e+1) −	(3.88e-3) −	(4.37e+0) −	(2.81e+1) −	(6.49e+1) −	(3.39e-2) −	(6.62e-5) −	(1.03e-2)
	15	6.4530e-1	1.0122e+1	7.3267e-1	1.0197e+3	7.4733e-1	2.0789e+1	5.7875e+1	4.1668e+2	7.5431e+0	6.9364e-1	6.0326e-1
		(6.74e-3) −	(8.85e+0) −	(9.39e-2) −	(7.79e+1) −	(1.15e-1) −	(1.81e+1) −	(3.18e+1) −	(8.10e+1) −	(9.30e+0) −	(6.90e-3) −	(9.66e-3)
	3	2.2976e-1	3.6285e-1	2.4089e-1	6.5748e-2	2.0117e-1	1.3310e-1	5.4476e-2	5.4639e-2	5.4466e-2	8.6943e-2	5.2912e-2
		(2.48e-1) −	(2.44e-1) −	(3.09e-1) −	(2.56e-3) −	(2.27e-1) −	(2.14e-1) −	(4.34e-5) −	(6.83e-5) −	(6.53e-7) −	(1.24e-1) −	(4.39e-4)
DTLZ4	5	3.3194e-1	3.2364e-1	2.1910e-1	2.3191e-1	4.0124e-1	2.1221e-1	2.8543e-1	2.1264e-1	2.1223e-1	2.3369e-1	2.0218e-1
		(1.26e-1) −	(1.20e-1) −	(3.76e-2) −	(5.46e-3) −	(2.56e-1) −	(4.87e-6) −	(1.17e-1) −	(1.12e-4) −	(3.24e-5) −	(6.55e-2) −	(1.38e-3)
	8	4.3407e-1	4.9564e-1	3.8690e-1	4.0836e-1	4.1862e-1	3.8690e-1	4.5537e-1	3.8727e-1	3.8758e-1	4.1490e-1	3.8045e-1
		(5.22e-2) −	(7.84e-2) −	(3.50e-5) −	(6.74e-3) −	(7.33e-2) −	(2.11e-5) −	(8.32e-2) −	(4.77e-4) −	(4.79e-4) −	(5.02e-2) −	(1.45e-2)
	10	5.4073e-1	6.3486e-1	5.0349e-1	5.0881e-1	5.8088e-1	5.0026e-1	5.6904e-1	5.4773e-1	5.1865e-1	5.2706e-1	4.6853e-1
		(5.54e-2) −	(9.46e-2) −	(5.65e-3) −	(5.76e-3) −	(5.62e-2) −	(1.11e-4) −	(6.68e-2) −	(4.10e-3) −	(2.67e-3) −	(4.15e-2) −	(1.74e-3)
	15	6.3760e-1	8.3126e-1	6.8935e-1	6.4356e-1	7.9229e-1	6.9624e-1	7.3558e-1	1.1748e+0	7.1215e-1	7.6129e-1	5.9563e-1
		(9.81e-3) −	(5.19e-2) −	(9.57e-3) −	(3.14e-3) −	(8.17e-2) −	(5.59e-5) −	(3.29e-2) −	(2.72e-1) −	(1.37e-2) −	(4.85e-2) −	(1.84e-3)
	3	9.9837e-3	5.5119e-1	5.3778e-3	9.3372e-3	3.3193e-2	3.3222e-2	1.2940e-2	1.9252e-2	3.7030e-2	6.2414e-2	4.2108e-3
		(1.63e-3) −	(1.92e-1) −	(1.30e-4) −	(1.16e-3) −	(1.88e-3) −	(3.31e-3) −	(2.33e-3) −	(4.81e-3) −	(4.50e-3) −	(8.30e-4) −	(7.08e-5)
DTLZ5	5	5.2781e-1	5.7312e-1	8.3552e-1	1.0726e+0	1.0728e+0	1.3363e+0	7.5769e-1	1.5149e+0	1.5548e+0	1.1354e+0	1.0428e+0
		(3.73e-2) +	(1.71e-1) +	(3.89e-2) +	(1.39e-1) ≈	(1.51e-1) ≈	(2.36e-1) −	(5.29e-2) +	(5.21e-2) −	(1.27e-1) −	(4.92e-2) −	(1.14e-1)
	8	2.0540e+0	6.4191e-1	9.7984e-1	1.0914e+0	1.4872e+0	1.2230e+0	1.0845e+0	2.5498e+0	8.9986e-1	1.4493e+0	8.8201e-1
		(7.86e-2) −	(1.32e-1) +	(6.51e-2) −	(8.82e-2) −	(8.46e-2) −	(1.02e-1) −	(1.09e-1) −	(1.30e-1) −	(1.87e-1) ≈	(9.83e-1) ≈	(2.66e-1)
	10	2.2764e+0	6.2418e-1	8.5015e-1	1.2594e+0	1.6476e+0	1.4004e+0	1.9813e+0	2.7636e+0	8.4567e-1	1.3388e+0	7.2746e-1
		(6.94e-2) −	(1.55e-1) ≈	(8.54e-2) −	(1.20e-1) −	(1.12e-1) −	(1.80e-1) −	(1.53e-1) −	(6.47e-2) −	(3.05e-1) ≈	(5.16e-1) −	(1.79e-1)
	15	2.4503e+0	7.1294e-1	5.5443e-1	1.7465e+0	1.6393e+0	4.4831e-1	1.5282e+0	2.6010e+0	4.4276e-1	5.5025e-1	5.1625e-1
		(4.98e-2) −	(1.55e-5) −	(7.10e-1) −	(2.08e-1) −	(1.12e-1) −	(2.33e-1) +	(3.29e-1) −	(1.42e-1) −	(2.28e-1) +	(2.37e-1) ≈	(1.70e-1)
	3	9.9022e-3	6.5233e-1	5.0262e-3	4.8233e-3	3.9913e-2	4.8476e-2	1.9591e-2	3.4961e-2	5.9143e-2	1.3375e-1	4.1255e-3
		(1.32e-3) −	(1.07e-1) −	(4.92e-5) −	(2.34e-4) −	(8.48e-4) −	(1.26e-2) −	(8.74e-3) −	(2.64e-3) −	(2.71e-2) −	(2.67e-2) −	(4.44e-5)
DTLZ6	5	1.3500e+0	7.4528e-1	1.6150e+0	2.9469e+0	3.3095e+0	2.9715e+0	2.6755e+0	3.7597e+0	3.1275e+0	1.6960e+0	2.8727e+0
		(8.65e-2) +	(2.24e-1) +	(2.62e-1) +	(3.10e-1) ≈	(1.40e-1) ≈	(7.87e-1) ≈	(3.76e-1) ≈	(4.43e-1) −	(3.15e-1) ≈	(3.12e-1) +	(8.50e-1)
	8	3.7150e+0	1.0261e+0	1.0858e+0	3.9622e+0	3.6620e+0	2.6306e+0	3.4572e+0	7.8158e+0	1.1950e+0	3.9885e+0	7.5717e-1
		(1.74e-1) −	(5.28e-1) ≈	(1.97e-1) −	(2.36e-1) −	(2.89e-1) −	(7.49e-1) −	(5.28e-1) −	(4.18e-1) −	(8.51e-1) ≈	(1.08e+0) −	(1.36e-1)
	10	6.8982e+0	8.5457e-1	9.2250e-1	4.4919e+0	4.3086e+0	2.7221e+0	4.0066e+0	1.0060e+1	2.0472e+0	2.0796e+0	7.5508e-1
		(3.17e-1) −	(3.67e-1) ≈	(2.87e-1) −	(2.62e-1) −	(2.60e-1) −	(7.21e-1) −	(5.36e-1) −	(2.00e-1) −	(1.02e+0) −	(1.07e+0) −	(1.52e-1)
	15	7.7052e+0	7.2267e-1	2.0131e-1	4.6460e+0	4.9856e+0	2.4061e+0	5.1073e+0	1.0371e+1	1.4237e+0	2.6452e+0	8.4011e-1
		(5.71e-1) −	(2.80e-2) +	(2.53e-1) +	(3.71e-1) −	(9.75e-1) −	(8.52e-1) −	(7.32e-1) −	(2.51e-1) −	(1.19e+0) ≈	(1.83e+0) −	(2.12e-1)
	3	9.7415e-2	9.4429e-1	1.7253e-1	6.5523e-2	2.5084e-1	1.2785e-1	7.6920e-2	1.0330e-1	1.0483e-1	1.0559e-1	5.7941e-2
		(1.03e-1) ≈	(4.93e-1) −	(2.04e-1) −	(3.01e-3) −	(2.06e-1) −	(9.31e-2) −	(4.02e-3) −	(6.55e-2) −	(6.54e-3) −	(6.97e-4) −	(1.12e-3)
DTLZ7	5	3.4007e-1	1.7825e+0	3.4970e-1	3.3320e-1	3.6587e-1	5.3131e-1	3.9093e-1	3.5486e-1	5.2089e-1	5.0924e-1	2.9189e-1
		(1.34e-1) −	(1.14e+0) −	(7.80e-3) −	(1.06e-2) −	(1.06e-1) −	(2.52e-2) −	(1.61e-2) −	(5.96e-3) −	(2.60e-2) −	(3.35e-4) −	(5.27e-3)
	8	9.2287e-1	4.2490e+0	1.7999e+0	7.6670e-1	1.1093e+0	1.3979e+0	9.2909e-1	1.2068e+0	2.0998e+0	1.8626e+0	6.8861e-1
		(2.36e-1) −	(1.81e+0) −	(9.85e-2) −	(2.16e-2) −	(3.01e-3) −	(2.54e-1) −	(5.42e-2) −	(1.92e-2) −	(4.05e-1) −	(3.49e-2) −	(3.34e-3)
	10	1.1936e+0	5.3752e+0	3.4475e+0	1.1484e+0	2.1200e+0	1.7017e+0	1.4483e+0	2.5004e+0	1.9509e+0	3.6477e+0	9.4275e-1
		(2.55e-1) −	(2.09e+0) −	(1.83e-1) −	(4.32e-2) −	(1.27e-2) −	(3.37e-1) −	(2.18e-1) −	(3.62e-1) −	(5.42e-1) −	(1.70e-2) −	(8.94e-3)
	15	3.3876e+0	2.8895e+0	7.5697e+0	2.9927e+0	8.2001e+0	1.1100e+1	5.8323e+0	8.9713e+0	7.9929e+0	7.0858e+0	1.5673e+0
		(7.82e-1) −	(3.45e-1) −	(6.22e-1) −	(3.76e-1) −	(1.17e+0) −	(5.45e-1) −	(7.05e-1) −	(7.69e-1) −	(5.57e-1) −	(3.08e-1) −	(1.25e-2)
$+/-/\approx$		2/32/1	4/28/3	4/31/0	0/33/2	1/32/2	2/32/1	2/32/1	0/35/0	2/28/5	2/31/2	

TABLE V: Mean and standard deviation of the DeltaP values obtained by MaOEAIH and other MaOEAs for WFG test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	1.6198e-1	2.2843e+0	1.4339e-1	1.7723e-1	1.4501e-1	1.3882e-1	1.4375e-1	1.5679e-1	1.4185e-1	1.4642e-1	1.5847e-1
		(4.22e-3) −	(5.55e-2) −	(2.56e-3) +	(9.37e-3) −	(1.65e-3) +	(1.80e-3) +	(2.16e-3) +	(6.43e-3) ≈	(1.54e-3) +	(2.59e-3) +	(4.90e-3)
WFG1	5	6.3413e-1	3.2968e+0	4.7381e-1	5.1110e-1	4.6317e-1	4.5055e-1	4.7296e-1	5.5745e-1	4.9373e-1	4.4786e-1	4.9624e-1
		(2.21e-2) −	(7.99e-1) −	(4.17e-3) ≈	(1.20e-2) −	(4.54e-3) +	(3.83e-2) +	(2.30e-3) ≈	(2.43e-2) −	(6.53e-2) ≈	(3.48e-3) +	(4.35e-2)
	8	1.3548e+0	6.3986e+0	1.0202e+0	1.0281e+0	1.6722e+0	1.0158e+0	9.9083e-1	1.4171e+0	9.9895e-1	1.3124e+0	9.6164e-1
		(6.50e-2) −	(2.74e+0) −	(6.26e-3) −	(3.89e-2) −	(1.05e-1) −	(5.06e-2) −	(5.35e-2) −	(7.47e-2) −	(5.29e-2) −	(1.50e-1) −	(6.46e-2)
	10	1.8813e+0	8.6795e+0	1.2879e+0	1.2369e+0	1.8211e+0	1.2977e+0	1.3426e+0	1.8517e+0	1.4252e+0	1.3838e+0	1.1503e+0
		(1.01e-1) −	(3.56e+0) −	(9.17e-3) −	(5.55e-2) −	(2.79e-1) −	(5.80e-2) −	(1.27e-1) −	(8.23e-2) −	(8.55e-2) −	(8.38e-2) −	(1.01e-1)
	15	2.7299e+0	1.4265e+1	2.0345e+0	1.9380e+0	3.5698e+0	2.1642e+0	2.1321e+0	3.2245e+0	2.1556e+0	2.2719e+0	1.8531e+0
		(1.84e-1) −	(5.48e+0) −	(1.60e-2) −	(1.65e-1) ≈	(3.56e-1) −	(8.82e-2) −	(1.90e-1) −	(1.78e-1) −	(1.12e-1) −	(6.85e-2) −	(2.24e-1)
	3	2.2769e-1	1.5373e+0	1.6502e-1	1.8853e-1	1.5562e-1	1.5835e-1	1.6581e-1	1.7406e-1	1.7054e-1	1.7343e-1	1.7041e-1
		(1.10e-2) −	(1.43e-1) −	(1.03e-3) +	(7.61e-3) −	(1.78e-3) +	(7.68e-4) +	(1.05e-3) +	(5.93e-3) −	(1.51e-3) ≈	(2.51e-3) −	(4.24e-3)
WFG2	5	6.2878e-1	1.9181e+0	5.0745e-1	5.7489e-1	4.9581e-1	4.7302e-1	5.0846e-1	5.8217e-1	5.2553e-1	4.7434e-1	5.5175e-1
		(1.24e-2) −	(3.04e-1) −	(1.32e-3) +	(1.99e-2) −	(8.45e-3) +	(9.86e-4) +	(1.45e-3) +	(2.06e-2) −	(2.01e-2) +	(7.86e-3) +	(2.64e-2)
	8	1.3574e+0	2.7477e+0	1.0842e+0	1.1557e+0	1.8655e+0	2.0635e+0	1.2141e+0	1.3896e+0	1.1252e+0	1.2897e+0	1.0616e+0
		(3.20e-2) −	(6.36e-1) −	(9.68e-3) −	(4.43e-2) −	(3.15e-1) −	(5.01e-1) −	(1.82e-1) −	(7.90e-2) −	(5.49e-2) −	(3.15e-2) −	(3.88e-2)
	10	1.9137e+0	4.3044e+0	1.3522e+0	1.4328e+0	2.1929e+0	3.0693e+0	1.4792e+0	1.9081e+0	1.4612e+0	1.5013e+0	1.3143e+0
		(6.63e-2) −	(2.94e+0) −	(1.14e-2) −	(1.33e-1) −	(1.85e-1) −	(8.29e-1) −	(1.62e-1) −	(7.27e-2) −	(1.12e-1) −	(2.12e-2) −	(7.13e-2)
	15	2.2712e+0	8.2657e+0	2.0633e+0	2.6275e+0	3.4293e+0	9.2874e+0	2.2390e+0	3.4713e+0	3.9870e+0	2.3463e+0	2.2021e+0
		(2.15e-1) ≈	(6.56e+0) −	(3.19e-2) +	(2.46e-1) −	(3.84e-1) −	(2.14e+0) −	(4.07e-1) ≈	(1.42e-1) −	(9.25e-1) −	(9.20e-3) −	(2.36e-1)
	3	7.4486e-1	3.1733e+0	6.9967e-1	6.9368e-1	4.1191e-1	3.9023e-1	6.6526e-1	8.6122e-1	7.0756e-1	6.0456e-1	6.7017e-1
		(3.56e-2) −	(4.68e-2) −	(2.41e-2) −	(6.30e-2) ≈	(2.10e-2) +	(1.11e-1) +	(2.92e-2) ≈	(3.08e-2) −	(6.00e-2) −	(1.83e-2) +	(2.45e-2)
WFG3	5	2.6163e+0	5.4169e+0	2.6018e+0	1.8041e+0	2.7575e+0	2.7042e+0	2.8066e+0	2.8343e+0	2.4018e+0	2.3859e+0	2.3598e+0
		(9.30e-2) −	(3.77e-2) −	(1.21e-1) −	(1.43e-1) +	(3.06e-2) −	(8.69e-2) −	(7.68e-2) −	(5.06e-2) −	(9.02e-2) −	(2.65e-2) −	(4.36e-2)
	8	6.4407e+0	8.8638e+0	5.3802e+0	3.7074e+0	5.8328e+0	4.4064e+0	6.5879e+0	6.1660e+0	2.6350e+0	4.9097e+0	5.2671e+0
		(1.43e-1) −	(6.78e-2) −	(2.78e-1) −	(4.05e-1) +	(1.30e-1) −	(1.79e+0) ≈	(3.34e-1) −	(1.06e-1) −	(1.02e+0) +	(6.55e-1) ≈	(4.74e-2)
	10	8.4992e+0	1.1174e+1	5.7644e+0	5.0470e+0	8.3560e+0	8.0067e+0	8.9650e+0	8.9557e+0	5.6288e+0	8.5011e+0	7.3373e+0
		(4.20e-1) −	(5.62e-2) −	(6.23e-1) +	(4.37e-1) +	(9.58e-2) −	(1.67e+0) −	(1.03e+0) −	(7.28e-2) −	(1.08e+0) +	(6.37e-2) −	(7.28e-2)
	15	1.4598e+1	1.6905e+1	1.0959e+1	8.9423e+0	1.3230e+1	1.1223e+1	1.2987e+1	1.7307e+1	1.0371e+1	1.3655e+1	1.3076e+1
		(7.94e-1) −	(1.16e-1) −	(3.15e+0) ≈	(1.37e+0) +	(2.00e-1) −	(1.56e+0) +	(1.13e+0) ≈	(1.81e-1) −	(2.64e+0) +	(8.77e-1) −	(2.99e-1)
	3	3.0344e-1	3.6534e+0	2.2088e-1	2.5463e-1	2.2286e-1	2.2087e-1	2.2088e-1	2.2120e-1	2.2091e-1	2.2106e-1	2.0445e-1
		(1.32e-2) −	(6.29e-1) −	(4.91e-6) −	(7.88e-3) −	(2.17e-3) −	(3.88e-6) −	(4.31e-6) −	(2.81e-4) −	(1.02e-5) −	(2.00e-4) −	(1.01e-3)
WFG4	5	1.4056e+0	6.2937e+0	1.2250e+0	1.3397e+0	1.2251e+0	1.2250e+0	1.2250e+0	1.2246e+0	1.2262e+0	1.2264e+0	1.1135e+0
		(2.44e-2) −	(7.46e-1) −	(1.46e-4) −	(2.97e-2) −	(2.38e-4) −	(5.61e-5) −	(6.63e-5) −	(1.11e-3) −	(7.60e-4) −	(1.52e-3) −	(2.71e-3)
	8	3.5651e+0	1.0050e+1	3.5275e+0	3.7228e+0	3.5330e+0	3.5219e+0	3.5227e+0	3.5439e+0	3.5637e+0	3.5114e+0	3.1604e+0
		(4.57e-2) −	(1.53e+0) −	(4.14e-3) −	(4.79e-2) −	(7.99e-3) −	(1.21e-3) −	(9.01e-4) −	(1.14e-2) −	(6.86e-3) −	(1.43e-2) −	(1.08e-2)
	10	5.3830e+0	1.2964e+1	5.8708e+0	5.5539e+0	6.1211e+0	5.8590e+0	5.8657e+0	6.0045e+0	5.9143e+0	5.8293e+0	4.8211e+0
		(1.07e-1) −	(2.51e+0) −	(1.01e-2) −	(5.40e-2) −	(8.34e-2) −	(4.47e-3) −	(6.89e-3) −	(7.56e-2) −	(1.09e-2) −	(3.65e-2) −	(1.79e-2)
	15	9.5276e+0	2.5029e+1	1.2041e+1	9.8008e+0	1.2717e+1	1.2005e+1	1.2046e+1	1.3242e+1	1.2033e+1	1.2846e+1	9.4634e+0
		(1.28e-1) −	(3.56e+0) −	(5.39e-2) −	(1.61e-1) −	(2.86e-1) −	(1.28e-2) −	(1.50e-1) −	(8.73e-2) −	(1.77e-1) −	(4.37e-1) −	(4.05e-2)
	3	3.0922e-1	1.2552e+0	2.2987e-1	2.5945e-1	2.3104e-1	2.2987e-1	2.2987e-1	2.2995e-1	2.3034e-1	2.3001e-1	2.1165e-1
		(1.23e-2) −	(1.00e+0) −	(1.68e-6) −	(8.52e-3) −	(9.04e-4) −	(3.08e-6) −	(3.68e-6) −	(2.11e-4) −	(6.79e-4) −	(5.82e-5) −	(1.11e-3)
WFG5	5	1.4002e+0	6.5811e+0	1.2153e+0	1.3131e+0	1.2153e+0	1.2153e+0	1.2153e+0	1.2128e+0	1.2335e+0	1.2156e+0	1.0984e+0
		(2.45e-2) −	(1.45e+0) −	(2.18e-5) −	(2.31e-2) −	(1.11e-5) −	(2.48e-5) −	(6.87e-6) −	(9.91e-4) −	(2.61e-2) −	(4.31e-4) −	(2.53e-3)
	8	3.5524e+0	1.2627e+1	3.5272e+0	3.6261e+0	3.5353e+0	3.5279e+0	3.5279e+0	3.5281e+0	3.5760e+0	3.5073e+0	3.1663e+0
		(6.22e-2) −	(2.45e+0) −	(2.45e-3) −	(5.58e-2) −	(5.66e-3) −	(6.27e-5) −	(9.08e-5) −	(7.00e-3) −	(1.02e-2) −	(7.71e-3) −	(7.73e-3)
	10	5.3951e+0	1.7068e+1	5.8141e+0	5.5862e+0	6.0313e+0	5.8202e+0	5.8203e+0	5.8801e+0	6.2084e+0	5.7945e+0	4.8035e+0
		(1.02e-1) −	(2.82e+0) −	(8.72e-3) −	(9.19e-2) −	(5.73e-2) −	(4.49e-4) −	(6.36e-4) −	(3.89e-2) −	(8.62e-2) −	(2.45e-2) −	(1.67e-2)
	15	9.6080e+0	2.7812e+1	1.1868e+1	9.7740e+0	1.2225e+1	1.1940e+1	1.1858e+1	1.3101e+1	1.2031e+1	1.1433e+1	9.4201e+0
		(1.45e-1) −	(2.94e+0) −	(1.08e-1) −	(2.06e-1) −	(1.16e-1) −	(4.25e-2) −	(1.99e-1) −	(1.67e-1) −	(1.69e-1) −	(2.28e-1) −	(4.92e-2)
	3	3.1789e-1	2.8971e+0	2.3984e-1	2.8936e-1	2.3938e-1	2.3945e-1	2.3733e-1	2.4285e-1	2.3829e-1	2.3761e-1	2.2111e-1
		(1.39e-2) −	(1.23e+0) −	(9.29e-3) −	(1.47e-2) −	(1.03e-2) −	(9.66e-3) −	(9.18e-3) −	(1.09e-2) −	(8.50e-3) −	(8.19e-3) −	(8.06e-3)
WFG6	5	1.4230e+0	4.9573e+0	1.2145e+0	1.3627e+0	1.2145e+0	1.2140e+0	1.2144e+0	1.2135e+0	1.2156e+0	1.2167e+0	1.1102e+0
		(2.12e-2) −	(1.50e+0) −	(1.14e-3) −	(3.30e-2) −	(1.20e-3) −	(7.56e-4) −	(7.74e-4) −	(1.36e-3) −	(5.22e-3) −	(3.36e-3) −	(2.66e-3)
	8	3.6224e+0	8.4405e+0	3.5328e+0	3.7456e+0	3.5499e+0	3.5328e+0	3.5516e+0	3.5507e+0	3.5465e+0	3.5893e+0	3.1764e+0
		(3.46e-2) −	(4.60e+0) −	(6.30e-3) −	(6.32e-2) −	(9.71e-3) −	(4.43e-3) −	(1.01e-1) −	(1.98e-2) −	(9.98e-3) −	(4.76e-2) −	(1.38e-2)
	10	5.7124e+0	1.1151e+1	5.7850e+0	5.6785e+0	6.2010e+0	5.8065e+0	5.8559e+0	6.1258e+0	5.8604e+0	6.0968e+0	4.8147e+0
		(7.65e-2) −	(5.65e+0) −	(2.25e-2) −	(1.89e-1) −	(1.03e-1) −	(1.22e-2) −	(2.10e-1) −	(8.12e-2) −	(1.21e-2) −	(1.82e-1) −	(1.55e-2)
	15	9.7708e+0	2.1076e+1	1.2015e+1	9.8130e+0	1.2828e+1	1.1914e+1	1.2149e+1	1.3583e+1	1.1948e+1	1.3026e+1	9.4432e+0
		(2.06e-1) −	(9.56e+0) −	(1.97e-1) −	(2.97e-1) −	(2.43e-1) −	(2.24e-2) −	(3.25e-1) −	(8.88e-2) −	(1.93e-1) −	(3.72e-1) −	(5.11e-2)
	3	3.0869e-1	2.8434e+0	2.2090e-1	2.4266e-1	2.2377e-1	2.2089e-1	2.2089e-1	2.2210e-1	2.2090e-1	2.2099e-1	2.0771e-1
		(1.05e-2) −	(9.21e-1) −	(1.06e-5) −	(7.65e-3) −	(1.87e-3) −	(5.13e-6) −	(7.21e-6) −	(6.09e-4) −	(7.07e-6) −	(2.99e-5) −	(2.09e-3)
WFG7	5	1.4312e+0	5.7248e+0	1.2268e+0	1.3302e+0	1.2268e+0	1.2258e+0	1.2258e+0	1.2236e+0	1.2280e+0	1.2314e+0	1.1252e+0
		(1.54e-2) −	(7.12e-1) −	(9.04e-4) −	(2.53e-2) −	(1.39e-3) −	(4.10e-4) −	(4.29e-4) −	(1.36e-3) −	(2.01e-3) −	(2.75e-3) −	(9.37e-3)
	8	3.6030e+0	9.5003e+0	3.5383e+0	3.6469e+0	3.5473e+0	3.5300e+0	3.5500e+0	3.5536e+0	3.5916e+0	3.7421e+0	3.1900e+0
		(4.25e-2) −	(1.23e+0) −	(7.08e-3) −	(4.96e-2) −	(8.32e-3) −	(7.01e-3) −	(6.36e-2) −	(2.41e-2) −	(1.36e-2) −	(9.25e-2) −	(1.56e-2)
	10	5.5709e+0	1.3280e+1	5.8713e+0	5.3824e+0	6.2353e+0	5.8743e+0	5.9171e+0	6.0813e+0	5.9483e+0	6.0997e+0	4.8311e+0
		(6.31e-2) −	(1.86e+0) −	(6.04e-2) −	(9.22e-2) −	(8.07e-2) −	(9.31e-3) −	(1.19e-1) −	(5.42e-2) −	(1.73e-2) −	(1.56e-1) −	(2.25e-2)
	15	9.4888e+0	2.4122e+1	1.1706e+1	9.6734e+0	1.2620e+1	1.1999e+1	1.2092e+1	1.3522e+1	1.3495e+1	1.2719e+1	9.4914e+0
		(9.16e-2) ≈	(2.35e+0) −	(1.97e-1) −	(1.89e-1) −	(1.98e-1) −	(4.97e-2) −	(1.87e-1) −	(2.17e-1) −	(1.64e+0) −	(3.35e+0) −	(6.57e-2)
	3	3.5380e-1	3.5728e+0	2.6396e-1	3.3840e-1	2.7339e-1	2.7367e-1	2.7333e-1	3.0022e-1	2.8426e-1	2.8118e-1	2.5492e-1
		(1.14e-2) −	(3.38e-1) −	(2.44e-3) −	(9.51e-3) −	(2.79e-3) −	(3.48e-3) −	(2.18e-3) −	(5.79e-3) −	(5.00e-3) −	(4.68e-3) −	(3.63e-3)
WFG8	5	1.3524e+0	5.5472e+0	1.2219e+0	1.4094e+0	1.2263e+0	1.2377e+0	1.2329e+0	1.2312e+0	1.3401e+0	1.2369e+0	1.1486e+0
		(2.10e-2) −	(1.88e+0) −	(4.94e-4) −	(2.75e-2) −	(4.21e-3) −	(1.07e-2) −	(1.22e-2) −	(2.91e-3) −	(1.94e-2) −	(8.82e-3) −	(6.55e-3)
	8	3.5323e+0	1.2470e+1	3.6105e+0	3.6817e+0	3.7501e+0	3.5787e+0	3.6883e+0	3.6797e+0	3.6154e+0	3.9216e+0	3.2682e+0
		(3.90e-2) −	(1.55e+0) −	(2.16e-2) −	(2.91e-2) −	(2.45e-2) −	(1.76e-2) −	(1.83e-1) −	(1.92e-2) −	(1.35e-1) −	(7.64e-2) −	(3.29e-2)
	10	5.4773e+0	1.5198e+1	5.9054e+0	5.7538e+0	6.0394e+0	5.7435e+0	5.8565e+0	6.0662e+0	5.8580e+0	6.1037e+0	4.9488e+0
		(1.31e-1) −	(2.34e+0) −	(7.89e-2) −	(2.32e-1) −	(4.94e-2) −	(1.02e-1) −	(1.47e-1) −	(7.04e-2) −	(7.95e-2) −	(1.81e-1) −	(5.20e-2)
	15	9.5207e+0	2.7044e+1	1.2005e+1	1.0051e+1	1.2947e+1	1.2310e+1	1.2123e+1	1.2947e+1	1.3031e+1	1.2232e+1	9.6363e+0
		(1.97e-1) +	(2.49e+0) −	(3.82e-1) −	(4.81e-1) −	(1.10e-1) −	(4.41e-1) −	(3.54e-1) −	(1.71e-1) −	(3.77e-1) −	(4.36e-1) −	(1.09e-1)
	3	3.0305e-1	2.1676e+0	2.2042e-1	2.5095e-1	2.2183e-1	2.2041e-1	2.2066e-1	2.2204e-1	2.2950e-1	2.2095e-1	2.0115e-1
		(1.27e-2) −	(5.65e-1) −	(2.77e-4) −	(1.27e-2) −	(1.49e-3) −	(2.14e-4) −	(3.03e-4) −	(1.02e-3) −	(2.51e-3) −	(4.70e-4) −	(1.62e-3)
WFG9	5	1.3645e+0	4.6900e+0	1.2140e+0	1.3037e+0	1.2154e+0	1.2149e+0	1.2149e+0	1.2088e+0	1.3631e+0	1.2188e+0	1.1082e+0
		(2.92e-2) −	(1.45e+0) −	(1.28e-3) −	(1.77e-2) −	(2.37e-3) −	(3.19e-3) −	(2.68e-3) −	(7.61e-3) −	(2.33e-2) −	(1.81e-3) −	(5.09e-3)
	8	3.4344e+0	1.0951e+1	3.5306e+0	3.5794e+0	3.5501e+0	3.5149e+0	3.5395e+0	3.5868e+0	3.5500e+0	3.5148e+0	3.2231e+0
		(4.03e-2) −	(3.12e+0) −	(1.10e-2) −	(7.92e-2) −	(1.57e-2) −	(1.07e-2) −	(2.19e-2) −	(2.52e-2) −	(2.05e-2) −	(1.66e-2) −	(3.29e-2)
	10	5.1888e+0	1.3945e+1	5.8085e+0	5.4026e+0	5.8813e+0	5.8353e+0	5.8235e+0	5.9208e+0	6.2667e+0	5.8288e+0	4.8424e+0
		(6.22e-2) −	(4.19e+0) −	(3.12e-2) −	(9.24e-2) −	(4.54e-2) −	(3.71e-2) −	(6.02e-2) −	(6.67e-2) −	(8.68e-2) −	(5.92e-2) −	(3.68e-2)
	15	9.1811e+0	2.6112e+1	1.1596e+1	9.0363e+0	1.2039e+1	1.1938e+1	1.1739e+1	1.2775e+1	1.1632e+1	1.1303e+1	9.5022e+0
		(8.81e-2) +	(6.40e+0) −	(2.78e-1) −	(2.14e-1) +	(5.57e-2) −	(2.68e-1) −	(3.58e-1) −	(2.35e-1) −	(5.73e-1) −	(4.38e-1) −	(1.06e-1)
$+/-/\approx$		2/41/2	0/45/0	5/38/2	5/38/2	5/40/0	6/38/1	3/38/4	0/44/1	5/38/2	4/40/1	

TABLE VI: Mean and standard deviation of the DeltaP values obtained by MaOEAIH and other MaOEAs for MAF and IDTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	4.4492e-2	1.6196e-1	4.3501e-2	4.6331e-2	7.0720e-2	8.1028e-2	6.1058e-2	7.1340e-2	7.7706e-2	8.2113e-2	4.0435e-2
		(6.37e-4) −	(4.66e-4) −	(1.07e-4) −	(4.92e-3) −	(2.29e-4) −	(7.35e-4) −	(1.91e-3) −	(7.89e-4) −	(4.88e-4) −	(1.81e-4) −	(1.44e-4)
MaF1	5	1.4920e-1	2.8638e-1	1.4813e-1	1.3385e-1	2.2812e-1	4.6355e-1	2.2598e-1	2.1666e-1	2.5578e-1	4.6715e-1	1.3100e-1
		(2.23e-3) −	(1.43e-2) −	(3.18e-3) −	(3.22e-3) −	(5.69e-4) −	(1.36e-1) −	(1.39e-2) −	(2.75e-3) −	(1.71e-2) −	(1.69e-1) −	(3.53e-4)
	8	2.6329e-1	3.7316e-1	2.6453e-1	2.2843e-1	3.4513e-1	3.2370e-1	3.1232e-1	3.5083e-1	4.6528e-1	6.9530e-1	2.1886e-1
		(3.96e-3) −	(5.21e-3) −	(9.61e-4) −	(3.49e-3) −	(6.30e-3) −	(1.09e-2) −	(8.72e-3) −	(1.10e-2) −	(2.23e-2) −	(4.63e-2) −	(4.36e-4)
	10	3.2152e-1	3.6667e-1	3.0261e-1	2.8558e-1	3.4325e-1	3.6594e-1	3.1977e-1	3.5632e-1	4.6312e-1	7.0229e-1	2.5454e-1
		(8.07e-3) −	(1.03e-2) −	(3.47e-4) −	(2.07e-2) −	(5.91e-3) −	(1.70e-2) −	(7.41e-3) −	(1.20e-2) −	(1.78e-2) −	(1.02e-1) −	(9.21e-4)
	15	4.0021e-1	4.0315e-1	4.4023e-1	4.2066e-1	4.1330e-1	3.9415e-1	3.7413e-1	4.6453e-1	5.8125e-1	7.7056e-1	3.0401e-1
		(1.29e-2) −	(2.36e-2) −	(5.41e-2) −	(2.72e-2) −	(1.35e-2) −	(2.10e-2) −	(9.05e-3) −	(2.84e-2) −	(2.38e-2) −	(7.80e-2) −	(9.35e-4)
	3	3.1535e-2	2.5390e-1	3.3145e-2	3.3307e-2	3.6444e-2	3.6488e-2	3.5774e-2	6.3494e-2	3.7342e-2	3.9798e-2	2.9304e-2
		(5.85e-4) −	(1.75e-1) −	(7.82e-4) −	(1.61e-3) −	(1.08e-4) −	(4.32e-4) −	(8.20e-4) −	(3.13e-3) −	(8.67e-4) −	(2.88e-4) −	(3.68e-4)
MaF2	5	1.2931e-1	1.7194e-1	1.2179e-1	1.4105e-1	1.3592e-1	1.4389e-1	1.4409e-1	1.5366e-1	1.5010e-1	1.4574e-1	1.1902e-1
		(3.13e-3) −	(8.40e-2) −	(1.56e-3) −	(5.73e-3) −	(8.44e-4) −	(4.13e-3) −	(4.31e-3) −	(1.64e-3) −	(7.07e-3) −	(1.53e-3) −	(1.19e-3)
	8	2.0106e-1	3.8783e-1	2.0143e-1	1.7910e-1	1.8077e-1	2.1185e-1	2.5050e-1	1.8381e-1	2.4377e-1	4.4848e-1	1.7141e-1
		(9.69e-3) −	(2.56e-2) −	(4.48e-3) −	(5.23e-3) −	(1.64e-3) −	(1.21e-2) −	(3.63e-2) −	(8.56e-4) −	(2.61e-2) −	(2.41e-1) −	(2.55e-3)
	10	2.5085e-1	4.1926e-1	2.4742e-1	2.0702e-1	2.1012e-1	3.0224e-1	2.6516e-1	2.1506e-1	2.5162e-1	5.7999e-1	1.9819e-1
		(3.72e-2) −	(1.76e-2) −	(1.31e-2) −	(7.82e-3) −	(2.19e-3) −	(2.72e-2) −	(2.90e-2) −	(1.89e-3) −	(1.67e-2) −	(2.10e-1) −	(2.13e-3)
	15	4.1890e-1	4.2886e-1	3.8133e-1	2.2218e-1	2.2375e-1	5.3500e-1	3.1896e-1	2.4045e-1	6.8898e-1	8.4207e-1	2.3376e-1
		(1.44e-2) −	(2.32e-2) −	(3.51e-2) −	(5.99e-3) +	(5.34e-4) +	(8.95e-2) −	(4.29e-2) −	(8.18e-3) −	(3.62e-2) −	(3.45e-2) −	(4.78e-3)
	3	4.0131e-2	3.2736e+4	4.6494e-2	1.4259e-1	3.9784e-2	5.0032e-2	4.6416e-2	2.7802e+6	4.6351e-2	4.1012e-2	3.4844e-2
		(1.08e-3) −	(4.99e+4) −	(5.20e-5) −	(5.89e-2) −	(2.75e-4) −	(2.64e-5) −	(7.42e-5) −	(1.26e+7) −	(9.44e-6) −	(1.36e-4) −	(1.59e-2)
MaF3	5	9.0968e-2	5.9944e+3	9.8587e-2	3.2010e+5	8.0785e-2	1.1019e-1	9.8531e-2	5.8450e+7	9.8658e-2	9.2896e-2	8.3496e-2
		(3.23e-3) −	(2.00e+4) −	(4.34e-4) −	(1.51e+6) −	(2.21e-3) +	(1.86e-4) −	(1.92e-4) −	(9.66e+7) −	(8.32e-5) −	(6.26e-2) −	(2.48e-3)
	8	1.4537e-1	1.6031e+3	1.4148e-1	4.4442e+12	1.6639e-1	3.7628e+7	6.1820e+8	1.5306e+11	1.0466e+9	1.0626e-1	1.2617e-1
		(6.80e-3) −	(7.16e+3) −	(1.43e-3) −	(4.42e+11) −	(4.59e-3) −	(1.28e+8) −	(3.39e+9) −	(7.49e+10) −	(4.32e+9) −	(8.59e-3) +	(1.72e-2)
	10	2.2882e-1	3.4065e+2	1.2121e-1	5.6157e+12	1.7522e-1	1.2774e+9	8.5924e+8	4.9587e+11	6.0737e+8	9.9025e-2	1.3136e-1
		(3.35e-1) −	(1.54e+3) −	(7.99e-4) +	(4.58e+11) −	(6.77e-3) −	(3.11e+9) −	(4.71e+9) −	(2.52e+11) −	(1.67e+9) −	(6.61e-3) +	(9.19e-3)
	15	1.1687e-1	1.4923e+2	2.7837e+5	6.1907e+12	1.8336e-1	2.8662e+9	1.5343e+10	7.8652e+11	1.1734e+9	1.2223e-1	1.5026e-1
		(7.68e-3) +	(2.31e+2) −	(1.52e+6) −	(4.52e+11) −	(1.31e-2) −	(3.00e+9) −	(2.42e+10) −	(6.05e+11) −	(2.58e+9) −	(4.97e-3) +	(1.16e-2)
	3	3.2403e-1	2.6763e+1	3.4695e-1	5.3228e-1	3.3922e-1	3.2442e-1	3.0960e+0	2.4548e+0	2.1782e+0	4.3212e-1	2.4618e-1
		(1.36e-2) −	(3.02e+1) −	(3.99e-2) −	(1.46e-1) −	(5.21e-3) −	(1.32e-2) −	(8.02e+0) −	(5.71e+0) −	(6.92e+0) −	(1.17e-1) −	(1.18e-2)
MaF4	5	2.3965e+0	9.6876e+1	2.8897e+0	2.9528e+0	2.8725e+0	3.9377e+0	9.8727e+0	2.8981e+1	7.7087e+0	4.4933e+0	1.9686e+0
		(7.48e-2) −	(8.41e+1) −	(2.11e-1) −	(3.52e-1) −	(5.11e-2) −	(4.55e-1) −	(1.86e+1) −	(4.51e+1) −	(1.65e+1) −	(1.18e+0) −	(1.21e-2)
	8	1.7175e+1	7.3210e+2	3.0874e+1	2.4874e+1	3.2914e+1	3.9790e+1	3.5814e+1	3.9342e+1	4.4804e+1	6.3241e+1	1.6644e+1
		(8.79e-1) −	(6.26e+2) −	(1.99e+0) −	(3.91e+0) −	(2.01e+0) −	(6.23e+0) −	(1.97e+0) −	(1.70e+0) −	(9.53e+0) −	(1.43e+1) −	(6.31e-1)
	10	6.7149e+1	4.7124e+3	1.4499e+2	8.9218e+1	1.4009e+2	1.8776e+2	1.5230e+2	1.4396e+2	1.5719e+2	2.0152e+2	6.7251e+1
		(5.21e+0) ≈	(4.01e+3) −	(1.60e+1) −	(1.17e+1) −	(3.63e+0) −	(2.38e+1) −	(1.12e+1) −	(3.48e+0) −	(2.07e+1) −	(3.37e+1) −	(3.20e+0)
	15	2.2534e+3	2.4004e+5	7.0742e+3	2.9832e+3	5.3771e+3	5.6267e+3	5.6718e+3	5.7033e+3	8.2495e+3	9.5027e+3	2.5196e+3
		(2.66e+2) +	(1.71e+5) −	(1.24e+3) −	(7.31e+2) −	(3.24e+2) −	(3.50e+2) −	(3.04e+2) −	(2.44e+2) −	(1.48e+3) −	(2.50e+3) −	(2.66e+2)
	3	1.4315e+0	1.4985e+0	1.3980e+0	4.5672e-1	1.2017e+0	7.2265e-1	4.1877e-1	2.6041e-1	2.5976e-1	3.0112e-1	2.3270e-1
		(1.51e+0) −	(8.69e-1) −	(1.41e+0) −	(8.37e-1) −	(1.45e+0) −	(1.41e+0) −	(4.92e-1) −	(6.03e-4) −	(3.18e-6) −	(2.27e-1) −	(1.62e-3)
MaF5	5	2.7907e+0	5.2505e+0	2.5008e+0	3.2992e+0	3.6409e+0	2.3736e+0	2.4757e+0	2.3758e+0	2.3735e+0	2.4157e+0	2.0511e+0
		(3.65e-1) −	(1.56e+0) −	(6.95e-1) −	(3.67e+0) −	(2.01e+0) −	(1.26e-3) −	(3.54e-1) −	(6.73e-3) −	(2.06e-3) −	(1.11e-1) −	(7.52e-2)
	8	2.1991e+1	4.1338e+1	2.8375e+1	2.5269e+1	2.7974e+1	2.8238e+1	2.8242e+1	2.7799e+1	2.7719e+1	2.9869e+1	1.6430e+1
		(6.09e+0) −	(9.94e+0) −	(1.82e-1) −	(1.43e+0) −	(3.29e+0) −	(1.65e-2) −	(2.22e-2) −	(4.03e-1) −	(3.84e-1) −	(4.62e+0) −	(1.33e+0)
	10	9.0449e+1	2.8494e+2	1.6612e+2	9.7564e+1	1.2346e+2	1.3718e+2	1.3721e+2	1.4085e+2	1.4037e+2	1.3389e+2	6.5694e+1
		(1.62e+1) −	(5.38e+1) −	(3.91e+0) −	(5.13e+0) −	(1.62e+1) −	(1.36e-1) −	(2.77e-1) −	(3.70e+0) −	(1.48e+0) −	(1.70e+1) −	(4.32e+0)
	15	2.4997e+3	7.3234e+3	5.8753e+3	2.4692e+3	3.6731e+3	4.8127e+3	4.8128e+3	5.5503e+3	4.9498e+3	6.6090e+3	2.0460e+3
		(3.78e+2) −	(1.02e+1) −	(2.72e+2) −	(1.56e+2) −	(4.74e+2) −	(2.10e+0) −	(1.77e+0) −	(6.65e+2) −	(7.16e+1) −	(1.02e+3) −	(1.04e+2)
	3	1.0106e-2	6.8749e-1	5.2336e-3	1.6632e-2	3.9256e-2	3.7771e-2	1.7039e-2	3.3861e-2	3.6777e-2	2.6260e-1	4.0309e-3
		(8.93e-4) −	(8.02e-2) −	(8.72e-5) −	(1.11e-2) −	(1.32e-3) −	(5.01e-3) −	(2.11e-3) −	(4.05e-3) −	(5.39e-3) −	(8.64e-1) −	(2.30e-5)
MaF6	5	1.0264e-2	6.8242e-1	5.0612e-3	8.8809e-3	7.9791e-2	1.6381e-1	7.1693e-2	6.5538e-2	2.0973e+0	8.5490e-2	4.1037e-3
		(1.21e-3) −	(8.37e-2) −	(5.29e-5) −	(4.15e-3) −	(3.61e-3) −	(4.24e-2) −	(1.87e-2) −	(1.01e-2) −	(7.27e+0) −	(1.32e-2) −	(6.21e-5)
	8	1.5084e+1	7.0447e-1	6.2899e-3	1.0133e+2	3.1452e+1	2.5038e+0	6.4731e+1	1.2153e-1	1.6300e-1	5.6062e-1	1.5866e+1
		(5.74e+1) +	(2.51e-2) +	(2.91e-4) +	(8.62e+1) −	(7.13e+1) −	(1.30e+1) +	(8.42e+1) −	(1.02e-2) +	(3.31e-2) +	(5.22e-1) +	(4.92e+1)
	10	1.2340e+2	7.1173e-1	1.1164e-2	1.3070e+2	9.9684e+1	8.1067e+1	1.4844e+2	9.7327e+1	3.1852e+0	1.5570e-1	3.0675e+1
		(1.17e+2) −	(2.03e-2) ≈	(7.37e-3) +	(1.38e+1) −	(7.35e+1) −	(6.82e+1) −	(5.27e+1) −	(1.06e+2) −	(1.63e+1) ≈	(1.12e-1) ≈	(5.15e+1)
	15	2.0899e+2	7.1299e-1	4.8725e-2	1.5007e+2	1.0258e+2	4.0147e+1	8.8591e+1	2.0273e+2	3.5369e-1	5.9375e-1	3.1378e+1
		(7.09e+1) −	(1.44e-4) +	(2.19e-2) +	(1.37e+1) −	(5.83e+1) −	(3.75e+1) ≈	(2.16e+1) −	(5.53e+1) −	(6.42e-2) +	(2.03e-1) +	(2.16e+1)
	3	8.7392e-2	8.2464e-1	1.9707e-1	8.4121e-2	1.5811e-1	1.1162e-1	8.5346e-2	1.0379e-1	1.0855e-1	1.0580e-1	5.8071e-2
		(9.01e-2) ≈	(5.11e-1) −	(2.33e-1) −	(7.23e-2) −	(1.25e-1) −	(6.88e-2) −	(5.38e-2) −	(6.57e-2) −	(6.82e-3) −	(1.15e-3) −	(1.27e-3)
MaF7	5	3.5891e-1	1.9313e+0	3.4787e-1	3.3295e-1	5.8827e-1	5.2932e-1	3.8876e-1	3.5593e-1	5.0117e-1	5.0935e-1	2.8796e-1
		(1.29e-1) ≈	(1.14e+0) −	(5.87e-3) −	(1.07e-2) −	(5.25e-1) −	(2.68e-2) −	(1.43e-2) −	(5.67e-3) −	(3.11e-2) −	(3.94e-4) −	(5.79e-3)
	8	9.1251e-1	4.3536e+0	1.8107e+0	7.6709e-1	1.1242e+0	1.3600e+0	9.3458e-1	1.2123e+0	2.0840e+0	1.8647e+0	6.8849e-1
		(1.72e-1) −	(1.75e+0) −	(6.82e-2) −	(2.63e-2) −	(7.83e-2) −	(2.60e-1) −	(4.96e-2) −	(2.21e-2) −	(4.02e-1) −	(2.75e-2) −	(4.82e-3)
	10	1.2007e+0	4.4229e+0	3.4416e+0	1.1617e+0	2.1207e+0	1.7166e+0	1.5295e+0	2.6453e+0	2.1542e+0	3.6487e+0	9.3905e-1
		(1.75e-1) −	(2.43e+0) −	(1.79e-1) −	(4.38e-2) −	(1.23e-2) −	(4.61e-1) −	(2.69e-1) −	(3.66e-1) −	(4.13e-1) −	(2.33e-2) −	(6.09e-3)
	15	3.2246e+0	3.1876e+0	7.3783e+0	3.1881e+0	8.0627e+0	1.1100e+1	5.5466e+0	8.9916e+0	8.1645e+0	7.1575e+0	1.5692e+0
		(8.03e-1) −	(1.70e+0) −	(3.22e-1) −	(4.81e-1) −	(8.23e-1) −	(5.49e-1) −	(7.45e-1) −	(5.99e-1) −	(4.66e-1) −	(1.73e-1) −	(1.29e-2)
	3	6.5314e-2	4.9465e-1	7.5999e-2	3.4105e-1	2.2909e-1	1.9258e-1	1.1044e-1	1.4783e-1	1.3407e-1	1.4239e-1	6.8359e-2
		(1.89e-3) +	(1.92e-1) −	(2.53e-3) −	(8.44e-2) −	(3.40e-1) −	(5.77e-2) −	(6.18e-3) −	(1.26e-2) −	(1.39e-2) −	(1.19e-2) −	(1.37e-3)
MaF8	5	1.1560e-1	7.7906e-1	1.3831e-1	2.6392e-1	2.6330e-1	4.1853e-1	2.4848e-1	2.4935e-1	3.7126e-1	4.8108e-1	1.1107e-1
		(3.68e-3) −	(2.29e-1) −	(5.19e-3) −	(7.16e-2) −	(2.79e-1) −	(1.74e-2) −	(2.21e-2) −	(2.11e-2) −	(1.18e-2) −	(4.81e-2) −	(1.46e-3)
	8	1.6004e-1	1.3743e+0	2.1730e-1	2.6096e-1	2.7587e-1	6.6270e-1	4.1913e-1	2.7966e-1	8.9184e-1	9.9976e-1	1.4664e-1
		(4.26e-3) −	(2.35e-1) −	(1.04e-2) −	(3.77e-2) −	(2.35e-3) −	(8.52e-2) −	(4.27e-2) −	(1.47e-2) −	(1.08e-1) −	(1.89e-1) −	(1.42e-3)
	10	1.7817e-1	1.6107e+0	2.4262e-1	2.6455e-1	4.0508e-1	1.0377e+0	4.7123e-1	4.5049e-1	9.3738e-1	1.0733e+0	1.6352e-1
		(3.52e-3) −	(2.33e-1) −	(7.74e-3) −	(3.92e-2) −	(2.78e-2) −	(1.27e-1) −	(8.50e-2) −	(5.30e-2) −	(1.46e-1) −	(1.98e-1) −	(1.44e-3)
	15	2.1556e-1	2.0019e+0	5.0385e-1	2.9653e-1	5.6157e-1	1.4715e+0	8.3483e-1	5.9553e-1	1.2557e+0	1.5852e+0	1.9907e-1
		(2.73e-3) −	(2.60e-1) −	(3.61e-2) −	(2.74e-2) −	(5.58e-2) −	(1.77e-1) −	(1.20e-1) −	(5.38e-2) −	(1.65e-1) −	(2.16e-1) −	(1.40e-3)
	3	6.9461e-2	8.2646e-1	6.2001e-2	4.5474e+0	6.1988e-2	6.1992e-2	6.1993e-2	1.6552e+2	6.6166e-2	6.1990e-2	6.0740e-2
		(1.07e-3) −	(2.51e-1) −	(6.99e-5) −	(6.76e+0) −	(9.42e-6) −	(1.08e-6) −	(8.23e-7) −	(2.02e+2) −	(5.44e-4) −	(1.31e-6) −	(3.85e-4)
MaF9	5	1.1388e-1	1.0309e+0	3.4477e+0	8.8186e+0	1.5849e-1	1.1862e+2	5.2589e+1	1.1168e+2	3.6113e+0	1.1560e+0	1.0756e-1
		(1.62e-3) −	(1.24e+0) −	(9.11e+0) −	(1.20e+1) −	(1.34e-2) −	(2.88e+2) −	(5.95e+1) −	(2.61e+2) −	(4.52e+0) −	(2.54e-1) −	(2.57e-3)
	8	1.5603e-1	1.4369e+0	1.2183e+1	1.7835e+3	2.2230e-1	1.5772e+3	1.9575e+3	2.7885e+3	3.5929e+0	4.6232e+0	1.6221e+1
		(2.50e-3) +	(8.71e-1) +	(5.67e+1) +	(7.76e+2) −	(2.16e-2) +	(1.04e+3) −	(1.56e+3) −	(2.80e+3) −	(7.45e+0) +	(4.57e+0) +	(3.22e+0)
	10	3.2317e-1	1.8417e+0	1.6066e+0	8.5842e+3	9.6174e-1	3.3945e+3	5.8686e+3	5.6483e+3	3.1888e+1	4.0819e+0	2.7164e+1
		(6.28e-2) +	(9.80e-1) +	(1.34e+0) +	(1.62e+3) −	(2.40e-1) +	(2.38e+3) −	(2.55e+3) −	(4.62e+3) −	(7.49e+1) −	(5.36e+0) +	(3.82e+0)
	15	2.2086e-1	7.0181e+0	1.5031e+2	7.1309e+1	4.2862e+0	1.7307e+3	2.9361e+3	1.1376e+3	2.5601e+1	4.9710e+1	3.0473e+0
		(3.24e-3) +	(5.39e+0) −	(4.47e+2) −	(7.22e+1) −	(3.49e+0) −	(2.49e+3) −	(4.49e+3) −	(2.19e+3) −	(4.85e+1) −	(1.39e+2) −	(6.93e+0)

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Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
MaF10	3	1.5880e-1	2.2842e+0	1.4466e-1	1.7632e-1	1.4533e-1	1.3935e-1	1.4437e-1	1.5625e-1	1.4160e-1	1.4572e-1	1.6118e-1
		(4.59e-3) ≈	(6.57e-2) −	(2.64e-3) +	(7.40e-3) −	(1.59e-3) +	(2.18e-3) +	(2.43e-3) +	(8.00e-3) ≈	(1.26e-3) +	(3.38e-3) +	(1.31e-2)
	5	6.2788e-1	3.4774e+0	4.7422e-1	5.1346e-1	4.6253e-1	4.4306e-1	4.7327e-1	5.5099e-1	4.7688e-1	4.4616e-1	4.9077e-1
		(2.29e-2) −	(8.21e-1) −	(4.10e-3) ≈	(1.06e-2) −	(3.96e-3) +	(3.47e-3) +	(2.46e-3) +	(1.81e-2) −	(1.52e-3) ≈	(5.82e-3) +	(3.51e-2)
	8	1.3693e+0	7.2504e+0	1.0226e+0	1.0318e+0	1.6900e+0	1.0099e+0	9.8519e-1	1.4458e+0	1.0098e+0	1.2475e+0	9.6378e-1
		(7.42e-2) −	(2.73e+0) −	(6.29e-3) −	(3.72e-2) −	(1.49e-1) −	(4.57e-2) −	(2.51e-2) −	(7.46e-2) −	(7.18e-2) −	(1.61e-1) −	(5.22e-2)
	10	1.8763e+0	7.9180e+0	1.2862e+0	1.2162e+0	1.8072e+0	1.2961e+0	1.3390e+0	1.8886e+0	1.4471e+0	1.3929e+0	1.1123e+0
		(1.21e-1) −	(3.97e+0) −	(1.03e-2) −	(3.37e-2) −	(2.99e-1) −	(6.10e-2) −	(9.86e-2) −	(1.28e-1) −	(9.03e-2) −	(1.00e-1) −	(4.33e-2)
	15	2.7222e+0	1.2930e+1	2.0356e+0	1.9000e+0	3.5118e+0	2.2123e+0	2.2439e+0	3.2306e+0	2.1757e+0	2.2723e+0	1.8487e+0
		(2.04e-1) −	(6.94e+0) −	(1.38e-2) −	(1.57e-1) ≈	(3.96e-1) −	(1.42e-1) −	(2.94e-1) −	(1.95e-1) −	(1.33e-1) −	(5.80e-2) −	(2.17e-1)
MaF11	3	2.2737e-1	1.5534e+0	1.6550e-1	1.9093e-1	1.5604e-1	1.5819e-1	1.6568e-1	1.7475e-1	1.7080e-1	1.7322e-1	1.7021e-1
		(1.11e-2) −	(1.47e-1) −	(1.00e-3) +	(6.90e-3) −	(2.10e-3) +	(1.20e-3) +	(9.46e-4) +	(5.42e-3) −	(2.50e-3) ≈	(1.51e-3) −	(4.55e-3)
	5	6.2575e-1	1.8347e+0	5.0719e-1	5.7738e-1	4.9422e-1	4.7279e-1	5.0872e-1	5.7551e-1	5.2119e-1	4.7569e-1	5.5250e-1
		(1.50e-2) −	(3.41e-1) −	(1.71e-3) +	(1.48e-2) −	(7.10e-3) +	(1.09e-3) +	(7.07e-4) +	(2.18e-2) −	(1.66e-2) +	(6.36e-3) +	(2.37e-2)
	8	1.3646e+0	2.7305e+0	1.0913e+0	1.1520e+0	1.7865e+0	1.9372e+0	1.1319e+0	1.3816e+0	1.1096e+0	1.3031e+0	1.0582e+0
		(3.63e-2) −	(7.15e-1) −	(2.67e-2) −	(4.28e-2) −	(2.84e-1) −	(5.49e-1) −	(9.41e-2) −	(4.96e-2) −	(2.90e-2) −	(3.17e-2) −	(4.05e-2)
	10	1.9024e+0	5.1281e+0	1.3511e+0	1.4287e+0	2.2929e+0	3.0684e+0	1.4885e+0	1.9005e+0	1.4233e+0	1.5022e+0	1.3460e+0
		(6.96e-2) −	(2.46e+0) −	(8.05e-3) ≈	(1.35e-1) −	(1.26e-1) −	(7.65e-1) −	(1.49e-1) −	(6.54e-2) −	(4.97e-2) −	(2.29e-2) −	(7.49e-2)
	15	2.3155e+0	7.7157e+0	2.0512e+0	2.5114e+0	3.7182e+0	8.6313e+0	2.1190e+0	3.5141e+0	3.6591e+0	2.3468e+0	2.2833e+0
		(2.34e-1) ≈	(7.34e+0) −	(3.99e-2) +	(3.20e-1) −	(6.49e-1) −	(2.37e+0) −	(2.91e-1) +	(1.48e-1) −	(8.64e-1) −	(8.47e-3) ≈	(2.93e-1)
MaF12	3	3.0228e-1	2.2654e+0	2.2043e-1	2.4681e-1	2.2985e-1	2.2042e-1	2.2052e-1	2.3069e-1	2.3303e-1	2.2477e-1	2.0107e-1
		(1.13e-2) −	(5.95e-1) −	(2.47e-4) −	(1.30e-2) −	(2.98e-2) −	(3.19e-4) −	(2.20e-4) −	(3.05e-2) −	(2.17e-2) −	(2.15e-2) −	(9.43e-4)
	5	1.3676e+0	4.8976e+0	1.2141e+0	1.3167e+0	1.2161e+0	1.2138e+0	1.2140e+0	1.2071e+0	1.3639e+0	1.2197e+0	1.1091e+0
		(2.47e-2) −	(1.59e+0) −	(1.43e-3) −	(2.15e-2) −	(3.13e-3) −	(2.50e-3) −	(2.20e-3) −	(5.49e-3) −	(2.59e-2) −	(4.19e-3) −	(5.27e-3)
	8	3.4378e+0	9.9415e+0	3.5318e+0	3.5400e+0	3.5495e+0	3.5188e+0	3.5561e+0	3.5821e+0	3.5557e+0	3.5069e+0	3.2259e+0
		(3.66e-2) −	(3.32e+0) −	(1.13e-2) −	(6.22e-2) −	(1.45e-2) −	(1.23e-2) −	(9.41e-2) −	(3.10e-2) −	(2.16e-2) −	(1.53e-2) −	(2.60e-2)
	10	5.1560e+0	1.6637e+1	5.8074e+0	5.4048e+0	5.8747e+0	5.8350e+0	5.8459e+0	5.9181e+0	6.2293e+0	5.8011e+0	4.8267e+0
		(7.53e-2) −	(2.49e+0) −	(3.25e-2) −	(7.76e-2) −	(3.62e-2) −	(2.89e-2) −	(6.84e-2) −	(5.82e-2) −	(9.49e-2) −	(5.48e-2) −	(2.46e-2)
	15	9.1462e+0	2.5515e+1	1.1592e+1	9.0284e+0	1.2052e+1	1.1962e+1	1.1780e+1	1.2766e+1	1.1784e+1	1.1221e+1	9.4846e+0
		(9.54e-2) +	(7.06e+0) −	(3.17e-1) −	(2.76e-1) +	(5.67e-2) −	(1.88e-1) −	(2.88e-1) −	(2.39e-1) −	(5.67e-1) −	(4.32e-1) −	(1.08e-1)
MaF13	3	8.6521e-2	5.6673e-1	6.5697e-2	1.6620e-1	6.3039e-2	6.1983e-2	6.8725e-2	1.8775e-1	7.0237e-2	6.5779e-2	7.9981e-2
		(3.19e-3) −	(2.36e-1) −	(6.94e-3) +	(3.85e-2) −	(2.00e-3) +	(3.36e-3) +	(7.86e-3) +	(8.90e-2) −	(4.19e-3) +	(4.21e-3) +	(7.39e-3)
	5	1.0606e-1	8.1602e-1	2.0392e+2	1.5134e+6	1.8322e-1	5.2957e+7	5.6339e+7	1.1209e+13	2.0925e+7	5.6448e+3	1.0126e-1
		(7.21e-3) −	(7.43e-2) −	(1.12e+3) −	(4.35e+6) −	(1.02e-2) −	(5.05e+7) −	(8.04e+7) −	(4.56e+13) −	(3.22e+7) −	(8.91e+3) −	(6.26e-3)
	8	1.2338e-1	1.1192e+0	1.4452e+6	2.5396e+7	4.2561e-1	1.8749e+8	1.0253e+8	2.7238e+13	2.0293e+6	2.0535e+3	1.2479e-1
		(1.02e-2) ≈	(1.10e-1) −	(7.92e+6) −	(4.65e+7) −	(3.49e-2) −	(1.98e+8) −	(1.39e+8) −	(1.37e+14) −	(1.11e+7) −	(1.11e+4) −	(1.10e-2)
	10	1.2740e-1	1.2876e+0	2.4214e+1	8.6252e+8	5.5895e-1	1.3446e+8	1.0697e+8	5.5485e+13	4.8733e+5	6.3877e+2	1.3305e-1
		(7.80e-3) ≈	(1.35e-1) −	(1.29e+2) −	(4.67e+9) −	(5.25e-2) −	(1.33e+8) −	(1.41e+8) −	(2.14e+14) −	(2.33e+6) −	(2.14e+3) −	(1.40e-2)
	15	1.4160e-1	1.6269e+0	2.4975e+5	1.0139e+7	7.6555e-1	2.6078e+8	7.0549e+8	1.2923e+14	1.0571e+13	1.4389e+5	1.5057e-1
		(5.95e-3) +	(2.38e-1) −	(1.37e+6) −	(1.91e+7) −	(1.32e-1) −	(2.09e+8) −	(2.79e+9) −	(3.76e+14) −	(4.02e+13) −	(7.87e+5) −	(1.12e-2)
IDTLZ1	3	2.2200e-2	1.5322e-1	2.1745e-2	1.1544e-1	3.5132e-2	8.5645e-2	3.8628e-1	1.0609e-1	3.8878e-2	4.7128e-2	1.9990e-2
		(4.07e-4) −	(9.14e-2) −	(3.29e-5) −	(1.33e-1) −	(4.34e-5) −	(1.89e-1) −	(7.91e-1) −	(2.72e-1) −	(2.07e-4) −	(2.74e-2) −	(1.13e-4)
	5	7.4080e-2	1.7684e-1	2.3888e-1	7.2702e-2	1.1631e-1	3.6638e-1	1.2822e-1	9.8329e-1	4.8917e-1	1.6955e-1	6.6983e-2
		(1.25e-3) −	(1.07e-1) −	(5.53e-1) −	(9.17e-3) −	(3.02e-3) −	(1.93e-1) −	(1.62e-1) −	(2.33e+0) −	(1.62e+0) −	(1.92e-2) −	(5.74e-4)
	8	1.3043e-1	2.9841e-1	1.3234e-1	1.1466e-1	1.8263e-1	1.6556e-1	1.5672e-1	1.7573e-1	2.6710e-1	2.7658e-1	1.1980e-1
		(2.09e-3) −	(1.36e-1) −	(7.79e-4) −	(3.13e-3) +	(6.18e-2) −	(4.94e-3) −	(4.29e-3) −	(5.38e-3) −	(1.41e-2) −	(3.36e-2) −	(5.32e-3)
	10	1.5670e-1	3.6564e-1	1.5103e-1	1.4157e-1	2.2153e-1	1.9651e-1	1.6269e-1	1.8900e-1	2.9320e-1	3.1190e-1	1.2864e-1
		(3.17e-3) −	(1.46e-1) −	(5.83e-4) −	(1.33e-2) −	(1.17e-1) −	(1.06e-2) −	(5.10e-3) −	(1.33e-2) −	(1.35e-2) −	(6.34e-2) −	(3.74e-3)
	15	1.9501e-1	4.4624e-1	2.2088e-1	2.1303e-1	2.3610e-1	2.0667e-1	1.9088e-1	1.9751e-1	3.5219e-1	3.6402e-1	1.7252e-1
		(5.23e-3) ≈	(1.22e-1) −	(1.49e-2) −	(1.31e-2) −	(9.71e-2) −	(3.03e-2) −	(7.00e-3) ≈	(1.07e-2) −	(1.64e-2) −	(4.65e-2) −	(2.69e-2)
IDTLZ2	3	7.3275e-2	3.3249e-1	7.7454e-2	6.8650e-2	7.4857e-2	7.1879e-2	7.4335e-2	8.1145e-2	8.3888e-2	8.0062e-2	5.2002e-2
		(3.36e-3) −	(6.50e-3) −	(6.64e-5) −	(7.66e-3) −	(1.19e-3) −	(7.71e-4) −	(2.04e-3) −	(1.87e-3) −	(3.26e-3) −	(1.08e-3) −	(3.35e-4)
	5	2.3590e-1	4.8874e-1	2.4085e-1	2.2749e-1	2.5570e-1	3.2443e-1	2.8120e-1	2.7264e-1	3.3283e-1	3.5578e-1	1.9723e-1
		(4.80e-3) −	(1.54e-2) −	(4.32e-3) −	(1.06e-2) −	(3.51e-3) −	(2.27e-2) −	(1.69e-2) −	(2.03e-3) −	(1.48e-2) −	(1.23e-2) −	(8.74e-4)
	8	4.1996e-1	7.6810e-1	5.2570e-1	4.4190e-1	6.3207e-1	6.3976e-1	5.8491e-1	6.5265e-1	7.0763e-1	7.7486e-1	3.7431e-1
		(4.15e-3) −	(1.17e-2) −	(1.45e-2) −	(2.47e-2) −	(1.20e-2) −	(1.08e-2) −	(1.36e-2) −	(3.59e-3) −	(2.36e-2) −	(3.54e-2) −	(1.33e-3)
	10	4.7800e-1	7.9919e-1	5.2438e-1	5.2423e-1	7.2351e-1	7.5577e-1	6.8944e-1	7.3831e-1	7.5288e-1	7.4994e-1	4.5650e-1
		(3.61e-3) −	(2.72e-2) −	(1.20e-2) −	(2.05e-2) −	(1.25e-2) −	(1.22e-2) −	(1.54e-2) −	(3.19e-3) −	(1.65e-2) −	(1.54e-2) −	(1.28e-3)
	15	5.9912e-1	8.8669e-1	7.3698e-1	6.2749e-1	8.3192e-1	8.6624e-1	8.4872e-1	8.6286e-1	1.0123e+0	9.3189e-1	5.9153e-1
		(6.01e-3) −	(7.19e-4) −	(1.80e-2) −	(4.90e-2) −	(8.77e-3) −	(1.48e-2) −	(1.08e-2) −	(4.41e-3) −	(4.48e-2) −	(2.67e-2) −	(2.57e-3)
$+/-/\approx$		9/58/8	4/70/1	11/62/2	3/71/1	9/66/0	6/68/1	6/68/1	1/73/1	6/66/3	11/62/2	

TABLE VII: Mean and standard deviation of the DM values obtained by MaOEAIH and other MaOEAs for DTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	6.5645e-1	5.8640e-1	2.2583e-1	5.7038e-1	2.3282e-1	2.3368e-1	2.3259e-1	5.8400e-1	2.3075e-1	2.3627e-1	6.3180e-1
		(1.50e-2) +	(1.62e-1) ≈	(3.72e-3) −	(6.67e-2) −	(3.40e-3) −	(3.90e-3) −	(3.48e-3) −	(5.23e-2) −	(1.86e-3) −	(2.55e-3) −	(1.94e-2)
DTLZ1	5	4.1411e-1	3.8389e-1	1.3115e-1	3.3150e-1	1.3339e-1	1.3396e-1	1.3234e-1	4.3272e-1	1.3339e-1	1.3845e-1	4.5313e-1
		(4.53e-2) −	(2.16e-1) ≈	(4.08e-3) −	(5.31e-2) −	(4.67e-3) −	(5.45e-3) −	(5.02e-3) −	(4.56e-2) ≈	(4.73e-3) −	(4.45e-3) −	(5.40e-2)
	8	3.6339e-1	2.8891e-1	3.1525e-1	2.6748e-1	2.5409e-1	2.8997e-1	3.0358e-1	3.3429e-1	2.7902e-1	2.6727e-1	4.9373e-1
		(3.54e-2) −	(1.61e-1) −	(5.58e-3) −	(3.54e-2) −	(4.37e-2) −	(4.89e-2) −	(3.23e-2) −	(3.73e-2) −	(4.46e-2) −	(5.67e-2) −	(5.04e-2)
	10	2.8951e-1	3.4838e-1	3.1798e-1	2.9500e-1	3.8320e-1	3.8224e-1	3.8462e-1	2.9152e-1	3.0686e-1	3.7471e-1	5.3868e-1
		(3.64e-2) −	(2.16e-1) −	(2.89e-2) −	(3.31e-2) −	(6.60e-3) −	(8.18e-3) −	(6.29e-3) −	(4.75e-2) −	(1.33e-2) −	(7.87e-3) −	(3.87e-2)
	15	2.9260e-1	3.4496e-1	2.8198e-1	3.6857e-1	1.9756e-1	1.5783e-1	1.7114e-1	1.5692e-1	2.3800e-1	2.0574e-1	4.2852e-1
		(4.74e-2) −	(2.67e-1) −	(4.27e-2) −	(2.78e-2) −	(5.63e-2) −	(2.76e-2) −	(3.70e-2) −	(2.78e-2) −	(4.78e-2) −	(4.78e-2) −	(4.06e-2)
	3	6.1223e-1	4.4132e-1	4.9301e-1	5.6187e-1	5.4241e-1	5.2482e-1	5.2479e-1	5.6137e-1	5.2341e-1	5.2341e-1	7.2326e-1
		(1.94e-2) −	(5.11e-3) −	(2.27e-4) −	(2.83e-2) −	(1.35e-2) −	(4.45e-3) −	(4.42e-3) −	(1.11e-2) −	(3.39e-16) −	(3.39e-16) −	(1.36e-2)
DTLZ2	5	4.6732e-1	2.3587e-1	1.8229e-1	3.4963e-1	2.0802e-1	2.0963e-1	2.0990e-1	3.3397e-1	2.0849e-1	2.0808e-1	6.3542e-1
		(1.95e-2) −	(1.44e-2) −	(3.33e-3) −	(2.59e-2) −	(5.65e-17) −	(3.08e-3) −	(4.62e-3) −	(1.31e-2) −	(6.92e-4) −	(3.76e-4) −	(1.23e-2)
	8	2.7217e-1	1.2340e-1	7.4968e-2	1.8424e-1	1.7839e-1	1.0428e-1	1.8061e-1	1.9177e-1	1.0373e-1	1.0373e-1	4.9184e-1
		(2.65e-2) −	(1.18e-2) −	(3.60e-3) −	(1.80e-2) −	(1.95e-2) −	(1.81e-3) −	(1.18e-1) −	(1.19e-2) −	(5.65e-17) −	(5.65e-17) −	(2.67e-2)
	10	1.9475e-1	8.5121e-2	1.3831e-1	1.3202e-1	1.9646e-1	1.8114e-1	1.9769e-1	1.8520e-1	1.7630e-1	1.8128e-1	4.7021e-1
		(2.22e-2) −	(9.00e-2) −	(1.88e-2) −	(2.53e-2) −	(1.25e-2) −	(7.79e-4) −	(3.01e-2) −	(1.43e-2) −	(6.55e-4) −	(2.60e-4) −	(2.09e-2)
	15	1.7571e-1	2.2768e-1	2.2182e-1	1.2654e-1	3.3920e-1	3.1188e-1	3.3535e-1	2.4097e-1	3.0072e-1	3.0521e-1	4.0304e-1
		(2.22e-2) −	(7.05e-2) −	(3.92e-3) −	(2.61e-2) −	(8.15e-3) −	(2.29e-2) −	(1.97e-2) −	(2.32e-2) −	(7.50e-3) −	(1.10e-2) −	(2.46e-2)
	3	6.3057e-1	4.6980e-1	4.8859e-1	5.5349e-1	5.4660e-1	5.2341e-1	5.2341e-1	6.0860e-1	5.2341e-1	5.2341e-1	7.2382e-1
		(2.27e-2) −	(2.23e-1) −	(4.33e-3) −	(6.41e-2) −	(9.71e-3) −	(3.39e-16) −	(3.39e-16) −	(9.30e-2) −	(3.39e-16) −	(3.39e-16) −	(1.56e-2)
DTLZ3	5	4.6511e-1	2.1006e-1	1.8774e-1	3.6857e-1	2.0808e-1	2.0842e-1	2.0815e-1	4.2030e-1	2.0934e-1	2.0802e-1	6.2672e-1
		(1.66e-2) −	(2.42e-1) −	(2.28e-2) −	(8.57e-2) −	(3.31e-4) −	(2.21e-3) −	(4.14e-4) −	(7.35e-2) −	(1.02e-3) −	(5.65e-17) −	(3.64e-2)
	8	2.5805e-1	1.0969e-1	1.0860e-1	1.2892e-1	1.7294e-1	1.0297e-1	1.3538e-1	2.3386e-1	1.0410e-1	1.0373e-1	4.7337e-1
		(2.80e-2) −	(1.35e-1) −	(5.40e-2) −	(2.04e-2) −	(1.58e-2) −	(6.99e-3) −	(5.98e-2) −	(3.32e-2) −	(1.41e-3) −	(5.65e-17) −	(3.40e-2)
	10	2.0438e-1	9.4368e-2	1.2952e-1	1.7371e-1	2.0901e-1	1.7744e-1	1.9361e-1	1.6431e-1	1.7333e-1	1.8135e-1	4.5107e-1
		(2.38e-2) −	(1.29e-1) −	(1.44e-2) −	(2.89e-2) −	(1.36e-2) −	(1.49e-2) −	(2.35e-2) −	(2.50e-2) −	(1.34e-2) −	(2.82e-17) −	(4.32e-2)
	15	1.4923e-1	2.3401e-1	2.1606e-1	2.6797e-1	3.2454e-1	2.2100e-1	2.5504e-1	2.0894e-1	2.2644e-1	3.0269e-1	3.6435e-1
		(1.99e-2) −	(1.97e-1) −	(4.14e-2) −	(2.60e-2) −	(5.03e-2) −	(2.35e-2) −	(2.19e-2) −	(1.90e-2) −	(2.81e-2) −	(1.62e-2) −	(3.41e-2)
	3	5.8722e-1	3.9734e-1	4.5263e-1	5.5774e-1	5.1585e-1	4.7827e-1	5.2575e-1	5.7069e-1	5.2341e-1	5.2272e-1	7.2106e-1
		(1.46e-1) −	(1.40e-1) −	(1.72e-1) −	(2.79e-2) −	(9.13e-2) −	(1.27e-1) −	(3.87e-3) −	(1.19e-2) −	(3.39e-16) −	(4.43e-2) −	(1.66e-2)
DTLZ4	5	4.6207e-1	2.4593e-1	1.9644e-1	3.6304e-1	1.9990e-1	2.1033e-1	2.7898e-1	3.0222e-1	2.1254e-1	2.1915e-1	6.2218e-1
		(3.70e-2) −	(2.74e-2) −	(2.97e-2) −	(2.66e-2) −	(5.13e-2) −	(4.15e-3) −	(1.00e-1) −	(1.35e-2) −	(3.47e-3) −	(3.66e-2) −	(1.66e-2)
	8	2.7313e-1	1.8746e-1	7.8534e-2	1.9510e-1	1.7972e-1	1.0373e-1	2.0930e-1	1.8512e-1	1.0558e-1	1.3450e-1	4.6981e-1
		(3.45e-2) −	(3.83e-2) −	(4.69e-3) −	(2.62e-2) −	(2.85e-2) −	(5.65e-17) −	(1.24e-1) −	(1.77e-2) −	(3.03e-3) −	(5.20e-2) −	(3.11e-2)
	10	2.0595e-1	1.7664e-1	1.2754e-1	1.1690e-1	1.9282e-1	1.8135e-1	2.0686e-1	1.4193e-1	1.7351e-1	1.8414e-1	4.3700e-1
		(1.74e-2) −	(2.52e-2) −	(1.13e-2) −	(2.38e-2) −	(2.27e-2) −	(2.82e-17) −	(3.51e-2) −	(1.59e-2) −	(2.46e-3) −	(1.36e-2) −	(2.79e-2)
	15	1.4711e-1	3.1033e-1	2.1764e-1	9.3713e-2	3.5069e-1	3.0309e-1	2.9804e-1	2.0333e-1	3.0064e-1	2.9907e-1	3.6562e-1
		(2.07e-2) −	(3.28e-2) −	(3.21e-2) −	(1.20e-2) −	(5.74e-2) ≈	(2.26e-16) −	(2.35e-2) −	(2.26e-2) −	(7.88e-3) −	(4.04e-2) −	(3.32e-2)
	3	7.8333e-1	1.4813e-1	7.7073e-1	6.4068e-1	2.6478e-1	2.6910e-1	5.8335e-1	4.9087e-1	5.9662e-1	7.0699e-1	8.3999e-1
		(1.65e-2) −	(8.29e-2) −	(1.08e-2) −	(2.45e-2) −	(2.20e-2) −	(2.73e-2) −	(4.06e-2) −	(5.54e-2) −	(7.02e-2) −	(1.98e-2) −	(8.11e-3)
DTLZ5	5	3.6664e-1	8.0139e-2	3.4243e-1	3.2665e-1	3.7759e-1	2.7965e-1	3.8113e-1	3.6033e-1	4.2510e-1	3.2742e-1	4.2971e-1
		(1.59e-2) −	(1.84e-2) −	(1.50e-2) −	(2.35e-2) −	(2.28e-2) −	(3.45e-2) −	(2.89e-2) −	(3.00e-2) −	(3.24e-2) ≈	(2.00e-2) −	(3.42e-2)
	8	3.7787e-1	8.4978e-2	2.8035e-1	2.9464e-1	4.1928e-1	3.0471e-1	2.8240e-1	1.9443e-1	3.6370e-1	4.9582e-1	5.2003e-1
		(1.61e-2) −	(1.88e-2) −	(1.88e-2) −	(3.28e-2) −	(1.63e-2) −	(2.19e-2) −	(4.90e-2) −	(1.72e-2) −	(6.22e-2) −	(3.16e-1) ≈	(5.61e-2)
	10	3.8662e-1	6.9795e-2	2.8251e-1	2.3201e-1	4.5149e-1	3.0413e-1	2.7168e-1	2.0055e-1	3.9031e-1	3.2315e-1	5.4408e-1
		(2.10e-2) −	(1.10e-2) −	(1.98e-2) −	(3.72e-2) −	(1.61e-2) −	(4.22e-2) −	(3.00e-2) −	(2.12e-2) −	(7.41e-2) −	(2.16e-1) −	(4.05e-2)
	15	2.9912e-1	8.1767e-2	1.8603e-1	1.1205e-1	3.4146e-1	3.5438e-1	3.0043e-1	2.4265e-1	5.2432e-1	7.5867e-1	5.5462e-1
		(1.90e-2) −	(6.91e-3) −	(2.44e-2) −	(4.45e-2) −	(3.00e-2) −	(6.38e-2) −	(7.31e-2) −	(3.96e-2) −	(1.67e-1) ≈	(1.63e-1) +	(5.91e-2)
	3	7.8582e-1	3.5113e-1	7.8500e-1	7.9997e-1	2.0482e-1	2.5091e-1	4.8188e-1	2.7329e-1	6.7899e-1	4.9281e-1	8.3117e-1
		(1.68e-2) −	(3.67e-1) −	(6.53e-3) −	(1.59e-2) −	(7.18e-3) −	(3.45e-2) −	(4.18e-2) −	(4.65e-2) −	(7.28e-2) −	(7.42e-2) −	(1.25e-2)
DTLZ6	5	4.0419e-1	1.3607e-1	3.6737e-1	3.0983e-1	3.1635e-1	3.3198e-1	3.4368e-1	3.1581e-1	3.9101e-1	3.1906e-1	2.9369e-1
		(1.33e-2) +	(2.47e-1) −	(1.92e-2) +	(2.36e-2) ≈	(2.24e-2) ≈	(3.08e-2) ≈	(3.44e-2) +	(3.06e-2) ≈	(5.14e-2) +	(4.06e-2) ≈	(1.26e-1)
	8	4.4319e-1	1.1655e-1	2.8884e-1	2.5475e-1	3.9003e-1	3.4173e-1	2.8474e-1	1.8307e-1	3.2544e-1	3.3615e-1	5.3224e-1
		(1.51e-2) −	(2.42e-1) −	(1.77e-2) −	(2.72e-2) −	(3.32e-2) −	(3.24e-2) −	(3.54e-2) −	(1.37e-2) −	(6.20e-2) −	(6.57e-2) −	(2.34e-2)
	10	3.8103e-1	4.9242e-2	2.5685e-1	2.0672e-1	4.3747e-1	3.3073e-1	2.4418e-1	1.8323e-1	3.7791e-1	3.0611e-1	5.3735e-1
		(1.53e-2) −	(8.60e-3) −	(3.28e-2) −	(4.53e-2) −	(2.86e-2) −	(3.20e-2) −	(4.28e-2) −	(1.21e-2) −	(7.97e-2) −	(7.06e-2) −	(2.26e-2)
	15	2.7065e-1	6.1929e-2	1.3411e-1	1.6979e-1	2.5924e-1	3.5806e-1	3.1309e-1	1.8192e-1	5.1045e-1	5.2599e-1	4.6441e-1
		(1.83e-2) −	(2.83e-2) −	(4.59e-2) −	(4.93e-2) −	(4.85e-2) −	(5.68e-2) −	(5.05e-2) −	(2.26e-2) −	(1.59e-1) ≈	(1.91e-1) ≈	(4.55e-2)
	3	7.2280e-1	2.2554e-1	6.2564e-1	7.0503e-1	5.9392e-1	5.3375e-1	6.8130e-1	6.4064e-1	5.8486e-1	8.0462e-1	7.5866e-1
		(5.10e-2) −	(9.72e-2) −	(5.19e-2) −	(3.74e-2) −	(9.58e-2) −	(7.68e-2) −	(4.06e-2) −	(3.95e-2) −	(3.97e-2) −	(1.61e-2) +	(2.41e-2)
DTLZ7	5	5.1295e-1	2.7792e-1	3.9726e-1	3.7820e-1	5.2785e-1	3.6587e-1	3.9397e-1	5.5218e-1	3.2136e-1	4.6611e-1	6.0065e-1
		(6.08e-2) −	(1.42e-1) −	(5.59e-2) −	(6.16e-2) −	(6.28e-2) −	(4.80e-2) −	(7.30e-2) −	(7.57e-2) −	(4.78e-2) −	(5.86e-2) −	(7.21e-2)
	8	6.9235e-1	4.1794e-1	6.0136e-1	4.6881e-1	5.3977e-1	5.8330e-1	5.9866e-1	6.5984e-1	4.9658e-1	5.8218e-1	6.6927e-1
		(7.64e-2) ≈	(2.80e-2) −	(5.66e-2) −	(7.43e-3) −	(4.42e-2) −	(5.71e-2) −	(6.46e-2) −	(4.93e-2) ≈	(7.04e-2) −	(7.57e-2) −	(6.40e-2)
	10	6.6080e-1	5.9437e-1	7.2440e-1	5.8632e-1	5.7126e-1	6.0895e-1	6.4055e-1	5.7138e-1	8.5082e-1	6.3059e-1	7.8735e-1
		(7.44e-2) −	(8.26e-2) −	(1.76e-2) −	(1.57e-2) −	(9.17e-3) −	(2.78e-2) −	(2.29e-3) −	(1.19e-2) −	(7.20e-2) +	(3.79e-2) −	(6.22e-2)
	15	9.3173e-1	9.0243e-1	8.8763e-1	8.6498e-1	8.7404e-1	8.7313e-1	7.6349e-1	8.8340e-1	7.7768e-1	9.7040e-1	9.9547e-1
		(1.85e-2) −	(2.45e-2) −	(5.56e-2) −	(1.65e-2) −	(3.65e-3) −	(3.37e-3) −	(1.10e-2) −	(1.00e-2) −	(2.00e-2) −	(2.33e-2) −	(7.80e-3)
$+/-/\approx$		2/32/1	0/33/2	1/34/0	0/34/1	0/33/2	0/34/1	1/34/0	0/32/3	2/30/3	2/30/3	

TABLE VIII: Mean and standard deviation of the DM values obtained by MaOEAIH and other MaOEAs for WFG test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
WFG1	3	6.0587e-1	3.2427e-2	5.3229e-1	5.1741e-1	5.4331e-1	5.2748e-1	5.4522e-1	5.5939e-1	5.4055e-1	5.4695e-1	6.5781e-1
		(1.66e-2) −	(1.43e-2) −	(6.12e-3) −	(2.15e-2) −	(1.08e-2) −	(7.27e-3) −	(4.60e-3) −	(1.47e-2) −	(7.27e-3) −	(9.61e-3) −	(1.30e-2)
	5	4.9307e-1	5.6521e-2	4.0686e-1	5.1057e-1	4.5214e-1	4.0522e-1	4.1933e-1	5.4816e-1	4.1573e-1	4.8853e-1	5.5493e-1
		(3.02e-2) −	(3.11e-2) −	(1.02e-2) −	(1.82e-2) −	(1.54e-2) −	(1.56e-2) −	(8.03e-3) −	(1.64e-2) ≈	(1.06e-2) −	(1.32e-2) −	(1.82e-2)
	8	3.4017e-1	1.1800e-1	2.9287e-1	4.4237e-1	3.6359e-1	3.8870e-1	3.1242e-1	4.2290e-1	3.4361e-1	4.1342e-1	4.7119e-1
		(2.17e-2) −	(1.11e-1) −	(1.11e-2) −	(2.35e-2) −	(1.49e-2) −	(2.44e-2) −	(2.34e-2) −	(2.50e-2) −	(1.89e-2) −	(2.54e-2) −	(2.66e-2)
	10	2.6329e-1	1.3157e-1	2.4301e-1	4.7176e-1	3.3870e-1	3.5307e-1	3.3096e-1	3.5769e-1	3.3048e-1	4.2918e-1	4.3554e-1
		(3.01e-2) −	(9.79e-2) −	(5.50e-3) −	(2.90e-2) +	(3.62e-2) −	(1.72e-2) −	(2.53e-2) −	(3.48e-2) −	(3.06e-2) −	(2.79e-2) −	(6.19e-2)
	15	1.9186e-1	3.1322e-1	1.4131e-1	3.8708e-1	2.5207e-1	2.4066e-1	2.8116e-1	1.8447e-1	2.4635e-1	2.9799e-1	2.3939e-1
		(5.02e-2) −	(2.05e-1) ≈	(9.47e-3) −	(3.34e-2) +	(1.58e-2) ≈	(3.24e-2) ≈	(2.82e-2) +	(3.07e-2) −	(2.32e-2) ≈	(1.91e-2) +	(6.63e-2)
WFG2	3	6.1561e-1	1.6072e-1	5.4842e-1	5.4409e-1	5.9761e-1	5.8995e-1	5.7957e-1	5.8224e-1	5.8777e-1	5.7703e-1	6.2489e-1
		(1.73e-2) −	(6.94e-2) −	(7.26e-3) −	(2.91e-2) −	(1.16e-2) −	(4.57e-3) −	(9.72e-3) −	(2.29e-2) −	(6.25e-3) −	(1.00e-2) −	(1.87e-2)
	5	5.0920e-1	2.0132e-1	4.1273e-1	5.0285e-1	4.5918e-1	3.7301e-1	4.2418e-1	5.1789e-1	4.3553e-1	4.7780e-1	5.3207e-1
		(1.70e-2) −	(5.80e-2) −	(1.04e-2) −	(2.03e-2) −	(1.96e-2) −	(9.47e-3) −	(8.58e-3) −	(1.49e-2) −	(3.04e-2) −	(1.55e-2) −	(2.35e-2)
	8	3.6183e-1	1.4544e-1	2.4475e-1	4.2171e-1	3.3861e-1	2.7503e-1	3.8332e-1	4.4301e-1	3.7910e-1	3.6589e-1	4.7866e-1
		(2.13e-2) −	(2.87e-2) −	(7.61e-3) −	(1.95e-2) −	(7.62e-2) −	(4.56e-2) −	(5.04e-2) −	(2.46e-2) −	(3.03e-2) −	(2.06e-2) −	(1.82e-2)
	10	2.7819e-1	1.2359e-1	1.8448e-1	4.0146e-1	2.8939e-1	2.8598e-1	3.7104e-1	3.3555e-1	3.2549e-1	3.6357e-1	4.9198e-1
		(2.05e-2) −	(1.77e-2) −	(6.11e-3) −	(2.20e-2) −	(4.51e-2) −	(4.18e-2) −	(5.82e-2) −	(2.13e-2) −	(2.68e-2) −	(1.42e-2) −	(2.16e-2)
	15	3.9483e-1	2.2206e-1	1.4757e-1	3.2048e-1	2.3050e-1	1.8172e-1	2.6609e-1	1.5876e-1	2.2014e-1	2.6266e-1	3.8979e-1
		(4.96e-2) ≈	(1.73e-1) −	(1.80e-2) −	(3.83e-2) −	(1.50e-2) −	(1.83e-2) −	(2.05e-2) −	(1.09e-2) −	(2.30e-2) −	(9.30e-3) −	(2.83e-2)
WFG3	3	5.8108e-1	7.5757e-1	4.6031e-1	4.7965e-1	5.6371e-1	4.5645e-1	5.5605e-1	5.4745e-1	4.6436e-1	6.3703e-1	6.1580e-1
		(2.69e-2) −	(3.19e-1) +	(1.69e-2) −	(2.34e-2) −	(3.11e-2) −	(3.28e-2) −	(2.14e-2) −	(3.55e-2) −	(4.14e-2) −	(2.43e-2) +	(1.34e-2)
	5	2.8327e-1	1.0000e+0	2.4104e-1	3.0061e-1	2.7324e-1	2.1121e-1	2.7578e-1	2.5199e-1	2.7142e-1	2.7832e-1	3.4302e-1
		(1.58e-2) −	(0.00e+0) +	(9.02e-3) −	(1.30e-2) −	(1.53e-2) −	(2.08e-2) −	(1.68e-2) −	(2.70e-2) −	(1.96e-2) −	(1.09e-2) −	(1.55e-2)
	8	1.6557e-1	9.3503e-1	1.3764e-1	2.3016e-1	1.3050e-1	1.9549e-1	1.6929e-1	1.3950e-1	2.7794e-1	1.7093e-1	2.1529e-1
		(1.83e-2) −	(1.29e-1) +	(9.83e-3) −	(1.78e-2) +	(8.76e-3) −	(7.15e-2) −	(1.93e-2) −	(9.98e-3) −	(5.46e-2) +	(3.87e-2) −	(1.00e-2)
	10	1.5005e-1	9.1600e-1	9.6543e-2	1.9082e-1	1.0898e-1	1.5513e-1	1.2545e-1	1.0441e-1	2.1540e-1	1.0705e-1	1.7779e-1
		(1.44e-2) −	(1.03e-1) +	(2.20e-2) −	(1.42e-2) +	(7.67e-3) −	(4.64e-2) −	(4.29e-2) −	(1.02e-2) −	(3.50e-2) +	(5.19e-3) −	(1.16e-2)
	15	1.0955e-1	8.5917e-1	6.0398e-2	1.2856e-1	1.4198e-1	1.8753e-1	1.9861e-1	1.1667e-1	2.0013e-1	1.7020e-1	1.1670e-1
		(1.88e-2) ≈	(7.08e-2) +	(6.87e-3) −	(1.11e-2) +	(6.32e-3) +	(2.43e-2) +	(1.83e-2) +	(1.17e-2) ≈	(3.76e-2) +	(1.54e-2) +	(1.31e-2)
WFG4	3	6.1954e-1	4.8026e-1	4.9248e-1	5.8817e-1	5.4818e-1	5.2342e-1	5.2341e-1	5.6993e-1	5.2423e-1	5.2432e-1	7.0406e-1
		(1.88e-2) −	(3.97e-1) −	(2.91e-3) −	(1.96e-2) −	(1.08e-2) −	(9.03e-5) −	(3.39e-16) −	(1.60e-2) −	(1.39e-3) −	(4.31e-3) −	(1.96e-2)
	5	4.6346e-1	1.0243e-1	1.8819e-1	3.7229e-1	2.1000e-1	2.0825e-1	2.0877e-1	3.1881e-1	2.2012e-1	2.1971e-1	6.3442e-1
		(1.93e-2) −	(2.46e-1) −	(3.98e-3) −	(3.00e-2) −	(2.76e-3) −	(4.95e-4) −	(1.20e-3) −	(1.04e-2) −	(4.74e-3) −	(5.07e-3) −	(1.25e-2)
	8	2.9689e-1	1.2969e-1	1.0809e-1	1.8287e-1	1.9178e-1	1.0644e-1	1.0923e-1	1.9103e-1	1.0464e-1	1.7825e-1	5.2710e-1
		(2.84e-2) −	(1.99e-1) −	(6.05e-3) −	(2.68e-2) −	(1.84e-2) −	(4.37e-3) −	(6.73e-3) −	(1.79e-2) −	(2.50e-3) −	(1.57e-2) −	(2.58e-2)
	10	3.1206e-1	1.5758e-1	1.2350e-1	1.1814e-1	2.1394e-1	1.8288e-1	1.8369e-1	2.0910e-1	1.7538e-1	1.8229e-1	5.1914e-1
		(3.05e-2) −	(2.56e-1) −	(8.97e-3) −	(2.03e-2) −	(1.22e-2) −	(2.50e-3) −	(3.81e-3) −	(1.08e-2) −	(1.14e-3) −	(1.11e-2) −	(2.10e-2)
	15	2.7089e-1	4.7777e-1	2.1742e-1	1.2185e-1	3.4357e-1	3.0535e-1	3.1906e-1	3.3482e-1	3.0069e-1	2.6098e-1	4.6703e-1
		(2.14e-2) −	(2.69e-1) ≈	(1.66e-2) −	(2.95e-2) −	(9.09e-3) −	(2.71e-3) −	(2.32e-2) −	(6.28e-3) −	(1.26e-2) −	(2.41e-2) −	(2.58e-2)
WFG5	3	6.3003e-1	3.8823e-1	4.8022e-1	5.7341e-1	5.3367e-1	5.1055e-1	5.1074e-1	5.4085e-1	5.1898e-1	5.1097e-1	7.0875e-1
		(1.94e-2) −	(1.95e-1) −	(1.45e-3) −	(2.85e-2) −	(1.41e-2) −	(2.26e-16) −	(5.70e-4) −	(9.71e-3) −	(1.04e-2) −	(1.21e-3) −	(1.88e-2)
	5	4.6708e-1	2.8403e-1	1.7720e-1	3.6167e-1	2.0796e-1	2.0696e-1	2.0729e-1	3.1292e-1	2.5213e-1	2.0903e-1	6.5236e-1
		(1.70e-2) −	(3.72e-1) −	(9.61e-4) −	(2.21e-2) −	(5.80e-4) −	(8.95e-4) −	(9.04e-4) −	(1.01e-2) −	(3.71e-2) −	(2.51e-3) −	(1.10e-2)
	8	2.8540e-1	4.9296e-1	9.3686e-2	1.5555e-1	1.7157e-1	1.0242e-1	1.0237e-1	2.0934e-1	1.6166e-1	1.6516e-1	5.3891e-1
		(2.75e-2) −	(4.22e-1) ≈	(7.62e-3) −	(2.25e-2) −	(1.85e-2) −	(2.70e-3) −	(3.54e-3) −	(1.90e-2) −	(2.28e-2) −	(1.46e-2) −	(2.48e-2)
	10	2.8670e-1	5.6761e-1	9.3185e-2	1.0774e-1	1.8030e-1	1.5566e-1	1.5540e-1	2.0355e-1	2.5058e-1	1.7002e-1	5.2957e-1
		(2.52e-2) −	(4.15e-1) ≈	(1.09e-2) −	(1.26e-2) −	(1.10e-2) −	(1.16e-3) −	(1.05e-3) −	(1.12e-2) −	(2.77e-2) −	(9.18e-3) −	(1.96e-2)
	15	2.5144e-1	6.1489e-1	2.1527e-1	1.3553e-1	3.3986e-1	3.1174e-1	3.2148e-1	3.0670e-1	3.1483e-1	3.1157e-1	4.7153e-1
		(2.51e-2) −	(3.30e-1) ≈	(1.25e-2) −	(2.74e-2) −	(5.12e-3) −	(1.49e-2) −	(3.34e-2) −	(1.07e-2) −	(1.44e-2) −	(2.82e-2) −	(2.16e-2)
WFG6	3	6.1862e-1	3.3826e-1	4.8313e-1	5.3904e-1	5.3397e-1	5.1178e-1	5.1095e-1	5.6553e-1	5.1373e-1	5.1220e-1	6.9376e-1
		(1.73e-2) −	(3.07e-1) −	(7.56e-3) −	(3.30e-2) −	(1.09e-2) −	(6.42e-3) −	(5.76e-3) −	(1.63e-2) −	(1.08e-2) −	(6.16e-3) −	(1.69e-2)
	5	4.5652e-1	1.3256e-1	1.7667e-1	3.3251e-1	2.0588e-1	2.0506e-1	2.0578e-1	3.3232e-1	2.1030e-1	2.0943e-1	6.3119e-1
		(1.62e-2) −	(1.78e-1) −	(2.33e-3) −	(2.61e-2) −	(1.43e-3) −	(1.44e-3) −	(1.68e-3) −	(1.32e-2) −	(1.67e-2) −	(3.68e-3) −	(1.39e-2)
	8	2.4217e-1	3.6788e-1	1.0356e-1	1.3773e-1	1.9607e-1	1.1889e-1	1.2432e-1	2.2801e-1	1.3314e-1	1.6043e-1	5.3423e-1
		(2.73e-2) −	(3.53e-1) −	(9.32e-3) −	(2.28e-2) −	(1.86e-2) −	(9.27e-3) −	(1.95e-2) −	(2.31e-2) −	(3.01e-2) −	(1.71e-2) −	(2.37e-2)
	10	1.8735e-1	3.7531e-1	1.0580e-1	1.0552e-1	1.4225e-1	1.5505e-1	1.5665e-1	1.4109e-1	1.6615e-1	1.4113e-1	5.1873e-1
		(2.01e-2) −	(4.00e-1) ≈	(1.66e-2) −	(1.45e-2) −	(1.90e-2) −	(3.08e-3) −	(1.18e-2) −	(1.58e-2) −	(2.19e-2) −	(1.94e-2) −	(1.68e-2)
	15	1.9509e-1	5.9633e-1	2.1234e-1	1.1156e-1	3.0548e-1	3.0061e-1	3.0779e-1	2.2956e-1	3.0883e-1	2.2953e-1	4.5780e-1
		(1.94e-2) −	(3.78e-1) ≈	(2.63e-2) −	(2.12e-2) −	(3.01e-2) −	(2.93e-3) −	(1.42e-2) −	(1.51e-2) −	(2.49e-2) −	(2.74e-2) −	(2.23e-2)
WFG7	3	6.2343e-1	3.9976e-1	4.8971e-1	6.0433e-1	5.5079e-1	5.2371e-1	5.2361e-1	5.7111e-1	5.2373e-1	5.2171e-1	6.9996e-1
		(2.09e-2) −	(2.70e-1) −	(3.79e-3) −	(2.68e-2) −	(1.18e-2) −	(6.92e-4) −	(5.05e-4) −	(1.76e-2) −	(8.89e-4) −	(4.26e-3) −	(1.92e-2)
	5	4.7179e-1	8.2729e-2	1.9276e-1	3.9298e-1	2.1957e-1	2.1317e-1	2.1316e-1	3.2031e-1	2.2571e-1	2.2958e-1	6.2056e-1
		(1.37e-2) −	(6.03e-2) −	(6.19e-3) −	(1.94e-2) −	(7.01e-3) −	(2.75e-3) −	(2.53e-3) −	(8.67e-3) −	(6.63e-3) −	(6.21e-3) −	(1.65e-2)
	8	2.9481e-1	2.5063e-1	1.6130e-1	1.9319e-1	1.9437e-1	1.2686e-1	1.4873e-1	2.1517e-1	1.0974e-1	1.7357e-1	5.1486e-1
		(2.81e-2) −	(1.94e-1) −	(1.74e-2) −	(2.30e-2) −	(1.26e-2) −	(1.34e-2) −	(5.86e-2) −	(1.54e-2) −	(4.66e-3) −	(1.51e-2) −	(2.65e-2)
	10	2.3701e-1	2.0448e-1	1.3258e-1	1.3290e-1	2.0090e-1	1.9658e-1	2.0129e-1	1.9743e-1	1.7663e-1	1.6250e-1	5.0284e-1
		(1.85e-2) −	(1.45e-1) −	(1.49e-2) −	(2.62e-2) −	(1.22e-2) −	(5.96e-3) −	(2.48e-2) −	(1.31e-2) −	(2.27e-2) −	(1.63e-2) −	(1.65e-2)
	15	2.3575e-1	4.6079e-1	2.0305e-1	1.2012e-1	3.4447e-1	3.3474e-1	3.3756e-1	2.8965e-1	3.2046e-1	2.5858e-1	4.8126e-1
		(2.16e-2) −	(2.06e-1) ≈	(1.97e-2) −	(1.80e-2) −	(1.03e-2) −	(7.10e-3) −	(1.42e-2) −	(2.09e-2) −	(3.45e-2) −	(3.00e-2) −	(2.12e-2)
WFG8	3	6.5915e-1	7.1576e-2	6.0150e-1	5.2066e-1	6.1899e-1	6.5005e-1	6.4839e-1	6.4767e-1	6.0953e-1	6.2901e-1	6.9440e-1
		(1.99e-2) −	(4.53e-2) −	(1.16e-2) −	(2.75e-2) −	(1.27e-2) −	(1.35e-2) −	(1.20e-2) −	(2.16e-2) −	(1.85e-2) −	(1.48e-2) −	(1.53e-2)
	5	4.8618e-1	3.3228e-1	3.1363e-1	3.7217e-1	3.5553e-1	4.6155e-1	4.4711e-1	3.9809e-1	5.1612e-1	3.3284e-1	6.2207e-1
		(1.91e-2) −	(3.48e-1) −	(6.36e-3) −	(1.66e-2) −	(1.27e-2) −	(1.87e-2) −	(1.95e-2) −	(1.63e-2) −	(1.71e-2) −	(7.72e-3) −	(1.43e-2)
	8	2.8682e-1	4.7249e-1	1.7396e-1	2.1018e-1	2.5323e-1	3.2409e-1	3.7474e-1	3.1801e-1	2.9572e-1	1.7389e-1	5.1615e-1
		(3.21e-2) −	(3.18e-1) ≈	(1.82e-2) −	(2.68e-2) −	(1.83e-2) −	(4.15e-2) −	(6.66e-2) −	(2.09e-2) −	(3.63e-2) −	(2.01e-2) −	(2.75e-2)
	10	2.4837e-1	5.1781e-1	1.2310e-1	1.8643e-1	1.8693e-1	2.6026e-1	2.8554e-1	1.9115e-1	3.1224e-1	1.5209e-1	5.0415e-1
		(2.60e-2) −	(2.91e-1) ≈	(1.95e-2) −	(2.60e-2) −	(1.97e-2) −	(4.65e-2) −	(4.79e-2) −	(2.78e-2) −	(5.98e-2) −	(4.45e-2) −	(2.04e-2)
	15	2.2286e-1	7.1184e-1	2.2665e-1	1.9477e-1	2.8746e-1	3.6839e-1	3.8474e-1	2.9158e-1	3.8127e-1	2.6793e-1	4.5675e-1
		(4.51e-2) −	(2.32e-1) +	(4.77e-2) −	(4.67e-2) −	(1.44e-2) −	(3.17e-2) −	(3.50e-2) −	(1.35e-2) −	(3.39e-2) −	(6.85e-2) −	(2.98e-2)
WFG9	3	6.1711e-1	2.3848e-1	5.1834e-1	6.0756e-1	5.6426e-1	5.4067e-1	5.4899e-1	6.1215e-1	5.6948e-1	5.2413e-1	7.1882e-1
		(1.82e-2) −	(1.95e-1) −	(1.01e-2) −	(3.17e-2) −	(1.85e-2) −	(1.07e-2) −	(1.50e-2) −	(1.78e-2) −	(1.67e-2) −	(1.17e-2) −	(1.90e-2)
	5	5.0597e-1	2.6392e-1	2.5119e-1	3.4831e-1	2.6802e-1	2.6721e-1	2.7262e-1	3.9110e-1	4.8782e-1	2.7622e-1	6.3337e-1
		(2.22e-2) −	(2.57e-1) −	(1.31e-2) −	(2.28e-2) −	(1.44e-2) −	(1.46e-2) −	(1.86e-2) −	(2.06e-2) −	(2.24e-2) −	(1.31e-2) −	(1.22e-2)
	8	3.4328e-1	4.4328e-1	1.5854e-1	1.8104e-1	1.6537e-1	1.6432e-1	1.8782e-1	3.0309e-1	2.5820e-1	1.9983e-1	5.2081e-1
		(2.50e-2) −	(3.54e-1) −	(9.78e-3) −	(1.65e-2) −	(1.69e-2) −	(1.47e-2) −	(2.50e-2) −	(2.83e-2) −	(1.90e-2) −	(1.56e-2) −	(2.58e-2)
	10	3.1441e-1	3.4148e-1	1.3657e-1	1.6229e-1	1.9940e-1	1.9396e-1	2.1499e-1	1.9859e-1	2.7793e-1	1.8559e-1	5.3048e-1
		(3.27e-2) −	(2.70e-1) −	(1.40e-2) −	(2.01e-2) −	(1.17e-2) −	(1.08e-2) −	(3.98e-2) −	(1.69e-2) −	(2.24e-2) −	(1.09e-2) −	(2.68e-2)
	15	3.0062e-1	6.4385e-1	2.6121e-1	2.3817e-1	3.3327e-1	3.4134e-1	3.6894e-1	2.7390e-1	3.6087e-1	3.1630e-1	5.0292e-1
		(3.16e-2) −	(3.15e-1) ≈	(2.84e-2) −	(4.85e-2) −	(1.31e-2) −	(1.29e-2) −	(1.79e-2) −	(1.84e-2) −	(4.65e-2) −	(3.58e-2) −	(2.28e-2)
$+/-/\approx$		0/43/2	6/28/11	0/45/0	5/40/0	1/43/1	1/43/1	2/43/0	0/43/2	3/41/1	3/42/0	

TABLE IX: Mean and standard deviation of the DM values obtained by MaOEAIH and other MaOEAs for MAF and IDTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
MaF1	3	6.5486e-1	2.5465e-1	3.6406e-1	6.6470e-1	3.9417e-1	1.4804e-1	5.3569e-1	4.6796e-1	2.2447e-1	3.9424e-1	7.0476e-1
		(1.56e-2) −	(6.39e-3) −	(2.89e-2) −	(2.16e-2) −	(1.45e-2) −	(1.72e-2) −	(3.17e-2) −	(2.70e-2) −	(1.79e-2) −	(1.10e-2) −	(1.94e-2)
	5	4.0911e-1	2.2443e-1	2.9267e-1	4.4904e-1	9.3110e-2	1.1038e-1	3.8100e-1	1.8939e-1	2.9652e-1	4.7274e-1	5.2157e-1
		(5.09e-2) −	(2.59e-2) −	(4.85e-2) −	(4.99e-2) −	(1.33e-2) −	(3.64e-2) −	(4.53e-2) −	(3.20e-2) −	(4.23e-2) −	(1.24e-1) ≈	(4.75e-2)
	8	3.7893e-1	2.2400e-1	2.1693e-1	3.9595e-1	2.3811e-1	3.3301e-1	3.4648e-1	2.9519e-1	2.1857e-1	3.8705e-1	5.0955e-1
		(5.06e-2) −	(2.34e-2) −	(2.54e-2) −	(3.33e-2) −	(3.25e-2) −	(2.91e-2) −	(2.92e-2) −	(2.49e-2) −	(4.27e-2) −	(7.05e-2) −	(4.79e-2)
	10	2.9932e-1	2.0374e-1	1.8801e-1	4.2146e-1	2.7861e-1	2.7707e-1	3.4723e-1	2.1911e-1	2.2196e-1	3.8901e-1	5.4732e-1
		(4.61e-2) −	(2.98e-2) −	(1.17e-2) −	(3.22e-2) −	(2.54e-2) −	(3.10e-2) −	(2.62e-2) −	(3.62e-2) −	(4.24e-2) −	(8.70e-2) −	(3.79e-2)
	15	3.0105e-1	1.8567e-1	1.8939e-1	3.3526e-1	2.4635e-1	2.5359e-1	2.5654e-1	2.3634e-1	2.3224e-1	4.2138e-1	4.5211e-1
		(3.45e-2) −	(1.11e-2) −	(2.41e-2) −	(3.24e-2) −	(2.18e-2) −	(1.98e-2) −	(1.56e-2) −	(1.79e-2) −	(1.44e-2) −	(9.90e-2) −	(2.96e-2)
MaF2	3	7.2041e-1	3.7191e-1	6.6347e-1	7.1633e-1	6.7375e-1	6.2166e-1	6.6939e-1	6.4805e-1	6.6220e-1	6.5783e-1	7.4209e-1
		(1.43e-2) −	(2.17e-1) −	(1.80e-2) −	(2.01e-2) −	(1.04e-2) −	(2.34e-2) −	(2.07e-2) −	(2.12e-2) −	(1.29e-2) −	(1.12e-2) −	(1.70e-2)
	5	6.4779e-1	4.5867e-1	6.4481e-1	5.7262e-1	6.2804e-1	5.6904e-1	6.2832e-1	6.3068e-1	5.5611e-1	6.5900e-1	7.2070e-1
		(3.40e-2) −	(1.08e-1) −	(3.07e-2) −	(4.27e-2) −	(2.39e-2) −	(3.58e-2) −	(2.71e-2) −	(2.00e-2) −	(4.01e-2) −	(2.36e-2) −	(2.47e-2)
	8	4.5539e-1	3.6466e-1	5.1466e-1	3.5150e-1	4.5005e-1	4.5608e-1	4.7863e-1	4.4913e-1	4.1107e-1	3.5390e-1	6.1910e-1
		(2.80e-2) −	(1.57e-2) −	(1.28e-2) −	(4.88e-2) −	(1.18e-2) −	(2.51e-2) −	(4.34e-2) −	(1.21e-2) −	(3.02e-2) −	(1.34e-1) −	(1.02e-2)
	10	4.8498e-1	3.5386e-1	4.5890e-1	2.4990e-1	4.3007e-1	3.6595e-1	4.3681e-1	4.3575e-1	3.9574e-1	3.5219e-1	6.0795e-1
		(2.62e-2) −	(1.46e-2) −	(2.53e-2) −	(4.38e-2) −	(1.14e-2) −	(2.41e-2) −	(3.37e-2) −	(1.33e-2) −	(3.13e-2) −	(1.09e-1) −	(1.09e-2)
	15	2.9359e-1	3.3553e-1	2.1882e-1	1.3448e-1	3.4294e-1	2.3046e-1	4.1159e-1	2.7089e-1	1.1699e-1	4.5636e-1	5.7108e-1
		(1.59e-2) −	(1.84e-2) −	(4.73e-2) −	(1.13e-1) −	(3.39e-3) −	(6.03e-2) −	(2.62e-2) −	(2.14e-2) −	(2.38e-2) −	(1.02e-1) −	(1.55e-2)
MaF3	3	5.5157e-1	1.4710e-1	4.6006e-1	4.0115e-1	4.7421e-1	4.5346e-1	4.6991e-1	4.1862e-1	4.6963e-1	4.7472e-1	6.1446e-1
		(1.72e-2) −	(9.90e-2) −	(4.63e-3) −	(6.31e-2) −	(1.00e-2) −	(2.57e-3) −	(2.54e-3) −	(8.65e-2) −	(2.39e-3) −	(5.41e-3) −	(4.10e-2)
	5	4.6304e-1	1.6436e-1	3.2784e-1	3.4394e-1	4.1659e-1	2.8447e-1	3.3140e-1	3.4521e-1	3.2764e-1	3.8340e-1	5.0766e-1
		(1.93e-2) −	(1.41e-1) −	(9.53e-3) −	(9.20e-2) −	(2.21e-2) −	(5.08e-3) −	(1.16e-2) −	(6.28e-2) −	(1.10e-2) −	(5.72e-2) −	(2.20e-2)
	8	3.0337e-1	1.6018e-1	3.4961e-1	1.5319e-1	2.9638e-1	2.6425e-1	3.8829e-1	1.5109e-1	2.8506e-1	3.3294e-1	4.1368e-1
		(2.69e-2) −	(1.71e-1) −	(1.67e-2) −	(2.40e-2) −	(1.19e-2) −	(8.12e-2) −	(4.25e-2) −	(2.56e-2) −	(6.13e-2) −	(2.46e-2) −	(4.06e-2)
	10	3.5814e-1	2.5120e-1	1.9842e-1	1.6425e-1	2.8128e-1	1.8171e-1	2.4216e-1	1.9027e-1	2.6599e-1	3.4009e-1	4.9361e-1
		(5.86e-2) −	(2.38e-1) −	(2.05e-2) −	(2.34e-2) −	(2.00e-2) −	(8.94e-2) −	(2.83e-2) −	(2.62e-2) −	(3.43e-2) −	(7.77e-2) −	(3.43e-2)
	15	3.6053e-1	3.4463e-1	9.9049e-2	1.7880e-1	2.3384e-1	1.9130e-1	2.3028e-1	2.4410e-1	2.2071e-1	3.1103e-1	3.7707e-1
		(3.53e-2) ≈	(2.51e-1) −	(2.56e-2) −	(2.78e-2) −	(1.12e-2) −	(2.33e-2) −	(2.66e-2) −	(2.99e-2) −	(3.74e-2) −	(1.65e-2) −	(4.37e-2)
MaF4	3	6.8102e-1	1.5437e-1	5.6518e-1	6.1250e-1	5.5077e-1	5.2005e-1	6.7005e-1	5.8495e-1	5.4690e-1	6.2621e-1	7.1209e-1
		(2.09e-2) −	(1.00e-1) −	(1.83e-2) −	(4.90e-2) −	(2.36e-2) −	(3.79e-2) −	(2.38e-2) −	(2.06e-2) −	(5.52e-2) −	(3.43e-2) −	(1.48e-2)
	5	6.1314e-1	1.0304e-1	4.8848e-1	5.8459e-1	4.1015e-1	4.3031e-1	4.4637e-1	4.4949e-1	3.9947e-1	5.3385e-1	6.1564e-1
		(1.45e-2) ≈	(1.29e-1) −	(1.57e-2) −	(2.36e-2) −	(2.18e-2) −	(4.82e-2) −	(6.57e-2) −	(2.47e-2) −	(5.10e-2) −	(4.61e-2) −	(1.86e-2)
	8	5.3687e-1	1.9466e-1	2.4501e-1	4.3164e-1	3.4182e-1	2.4580e-1	2.6467e-1	1.8936e-1	2.7236e-1	3.3938e-1	4.5067e-1
		(2.56e-2) +	(2.17e-1) −	(2.43e-2) −	(4.26e-2) −	(2.36e-2) −	(3.83e-2) −	(3.12e-2) −	(1.46e-2) −	(3.83e-2) −	(5.37e-2) −	(3.43e-2)
	10	4.9073e-1	1.2804e-1	2.2030e-1	4.3947e-1	1.4711e-1	2.3634e-1	3.0842e-1	1.8974e-1	2.0480e-1	3.6707e-1	4.0876e-1
		(2.02e-2) +	(1.69e-1) −	(1.60e-2) −	(3.12e-2) +	(3.27e-2) −	(2.65e-2) −	(2.06e-2) −	(1.36e-2) −	(2.34e-2) −	(4.45e-2) −	(2.43e-2)
	15	4.1443e-1	1.3179e-1	1.4374e-1	2.9891e-1	1.3050e-1	1.9694e-1	1.7346e-1	1.5142e-1	2.2000e-1	3.5352e-1	3.2791e-1
		(2.87e-2) +	(1.40e-1) −	(1.05e-2) −	(3.69e-2) −	(2.47e-2) −	(1.95e-2) −	(2.46e-2) −	(1.98e-2) −	(3.40e-2) −	(6.02e-2) ≈	(2.27e-2)
MaF5	3	5.5142e-1	3.5574e-1	4.5875e-1	5.4457e-1	4.4658e-1	4.7383e-1	5.1367e-1	5.7030e-1	5.2341e-1	5.2911e-1	7.3401e-1
		(2.37e-1) −	(1.61e-1) −	(1.91e-1) −	(1.04e-1) −	(1.81e-1) −	(1.56e-1) −	(6.05e-2) −	(1.29e-2) −	(3.39e-16) −	(3.12e-2) −	(1.48e-2)
	5	4.4701e-1	1.7176e-1	1.9686e-1	3.8145e-1	2.0701e-1	2.1085e-1	2.3678e-1	3.0280e-1	2.1135e-1	2.2585e-1	6.2906e-1
		(2.83e-2) −	(4.13e-2) −	(3.48e-2) −	(7.51e-2) −	(3.23e-2) −	(4.66e-3) −	(7.25e-2) −	(1.33e-2) −	(2.07e-3) −	(3.73e-2) −	(1.13e-2)
	8	2.8559e-1	8.4202e-2	8.9585e-2	1.9414e-1	1.9029e-1	1.0385e-1	1.0396e-1	1.8879e-1	1.0521e-1	1.8913e-1	4.6896e-1
		(2.47e-2) −	(2.34e-2) −	(1.50e-2) −	(1.93e-2) −	(2.80e-2) −	(6.79e-4) −	(1.27e-3) −	(1.54e-2) −	(2.50e-3) −	(6.26e-2) −	(2.85e-2)
	10	1.9547e-1	5.7920e-2	8.0217e-2	1.5137e-1	1.8879e-1	1.8146e-1	1.8194e-1	1.3528e-1	1.7380e-1	1.5018e-1	3.7904e-1
		(1.88e-2) −	(1.15e-2) −	(7.30e-3) −	(1.54e-2) −	(2.59e-2) −	(4.36e-4) −	(2.43e-3) −	(1.65e-2) −	(2.35e-3) −	(3.33e-2) −	(2.35e-2)
	15	1.4095e-1	1.6227e-1	1.0128e-1	1.0923e-1	3.3603e-1	3.0309e-1	3.0309e-1	1.9627e-1	3.0309e-1	2.0973e-1	2.7803e-1
		(2.53e-2) −	(1.74e-2) −	(1.41e-2) −	(1.91e-2) −	(5.94e-2) +	(2.26e-16) +	(2.26e-16) +	(1.69e-2) −	(2.26e-16) +	(3.35e-2) −	(2.16e-2)
MaF6	3	7.8116e-1	3.4871e-1	7.7701e-1	5.8781e-1	2.0814e-1	2.4966e-1	5.0814e-1	3.0290e-1	6.0558e-1	7.9029e-1	8.3204e-1
		(2.18e-2) −	(3.11e-1) −	(8.04e-3) −	(6.62e-2) −	(1.46e-2) −	(3.78e-2) −	(3.02e-2) −	(5.92e-2) −	(7.68e-2) −	(2.68e-2) −	(8.39e-3)
	5	7.8009e-1	3.7798e-1	7.7751e-1	6.6071e-1	1.4662e-1	1.2888e-1	3.7284e-1	2.5772e-1	6.6314e-1	7.6400e-1	8.4484e-1
		(1.88e-2) −	(3.31e-1) −	(4.92e-3) −	(4.62e-2) −	(2.17e-2) −	(5.21e-2) −	(4.21e-2) −	(4.56e-2) −	(8.59e-2) −	(6.89e-2) −	(1.15e-2)
	8	7.3032e-1	2.8933e-1	7.3451e-1	3.1420e-1	1.3942e-1	2.4789e-1	3.1908e-1	1.5986e-1	5.1795e-1	6.8620e-1	7.9071e-1
		(1.80e-1) −	(3.07e-1) −	(1.31e-2) −	(3.13e-1) −	(4.44e-2) −	(7.03e-2) −	(1.43e-1) −	(3.44e-2) −	(1.04e-1) −	(1.73e-1) −	(1.91e-1)
	10	4.2221e-1	2.6559e-1	5.6738e-1	3.7790e-2	1.7538e-1	1.5417e-1	1.4894e-1	1.1026e-1	5.3882e-1	7.5424e-1	4.7634e-1
		(3.49e-1) −	(3.07e-1) −	(1.49e-1) ≈	(2.08e-2) −	(6.84e-2) −	(3.81e-2) −	(7.06e-2) −	(2.04e-2) −	(1.45e-1) ≈	(5.19e-2) +	(2.82e-1)
	15	1.5201e-1	8.0990e-2	1.7393e-1	4.2060e-2	2.0233e-1	2.1194e-1	1.8112e-1	1.6578e-1	6.3653e-1	7.6164e-1	3.2097e-1
		(2.12e-1) −	(6.07e-3) −	(6.93e-2) −	(1.79e-2) −	(2.88e-2) −	(4.27e-2) −	(3.86e-2) −	(1.86e-2) −	(1.27e-1) +	(1.79e-1) +	(1.05e-1)
MaF7	3	7.2999e-1	2.3147e-1	6.1156e-1	6.9278e-1	6.3443e-1	5.6392e-1	6.7365e-1	6.3264e-1	5.7080e-1	8.0414e-1	7.6875e-1
		(3.81e-2) −	(9.59e-2) −	(5.78e-2) −	(4.59e-2) −	(5.03e-2) −	(7.52e-2) −	(4.68e-2) −	(4.04e-2) −	(4.18e-2) −	(1.80e-2) +	(1.90e-2)
	5	5.0529e-1	2.7104e-1	4.2463e-1	3.6639e-1	4.8084e-1	3.4613e-1	4.1476e-1	5.7191e-1	3.3394e-1	4.7292e-1	6.0405e-1
		(5.08e-2) −	(1.45e-1) −	(4.84e-2) −	(4.88e-2) −	(9.22e-2) −	(5.38e-2) −	(5.63e-2) −	(5.40e-2) −	(3.81e-2) −	(8.71e-2) −	(6.60e-2)
	8	6.8469e-1	4.1680e-1	6.1028e-1	4.7190e-1	5.4183e-1	5.7626e-1	6.1083e-1	6.4847e-1	5.0364e-1	6.2007e-1	6.7807e-1
		(9.80e-2) ≈	(2.56e-2) −	(5.81e-2) −	(1.28e-2) −	(5.00e-2) −	(4.71e-2) −	(7.22e-2) −	(4.71e-2) ≈	(5.07e-2) −	(5.12e-2) −	(7.78e-2)
	10	6.4365e-1	6.0762e-1	7.2483e-1	5.8579e-1	5.7216e-1	6.0973e-1	6.3874e-1	5.7349e-1	8.5535e-1	6.4623e-1	7.8572e-1
		(5.10e-2) −	(6.77e-2) −	(1.63e-2) −	(1.92e-2) −	(8.39e-3) −	(2.25e-2) −	(4.06e-3) −	(1.17e-2) −	(4.91e-2) +	(3.70e-2) −	(6.17e-2)
	15	9.3022e-1	9.0545e-1	8.7676e-1	8.6951e-1	8.7374e-1	8.7223e-1	7.6620e-1	8.8129e-1	7.7587e-1	9.7161e-1	9.9305e-1
		(1.45e-2) −	(2.51e-2) −	(5.19e-2) −	(1.20e-2) −	(2.30e-3) −	(6.88e-3) −	(2.49e-2) −	(9.91e-3) −	(1.63e-2) −	(2.33e-2) −	(8.80e-3)
MaF8	3	6.9237e-1	1.4901e-1	6.1600e-1	4.0987e-1	4.0829e-1	3.6362e-1	5.8187e-1	5.6003e-1	4.5701e-1	6.5233e-1	7.1658e-1
		(1.47e-2) −	(1.06e-1) −	(2.16e-2) −	(5.22e-2) −	(1.11e-1) −	(6.82e-2) −	(2.29e-2) −	(2.56e-2) −	(5.77e-2) −	(4.42e-2) −	(9.81e-3)
	5	6.5816e-1	1.5197e-1	5.8315e-1	5.5425e-1	5.3839e-1	1.6325e-1	4.9096e-1	5.7783e-1	2.0249e-1	7.3283e-1	7.0757e-1
		(1.27e-2) −	(7.30e-2) −	(1.53e-2) −	(2.52e-2) −	(9.93e-2) −	(3.25e-2) −	(3.41e-2) −	(2.19e-2) −	(2.60e-2) −	(5.50e-2) ≈	(9.11e-3)
	8	6.6022e-1	6.3591e-2	5.2936e-1	5.8250e-1	4.9270e-1	2.3779e-1	4.5007e-1	5.8201e-1	1.5507e-1	7.2345e-1	7.0894e-1
		(1.28e-2) −	(4.73e-2) −	(1.66e-2) −	(1.59e-2) −	(1.30e-2) −	(4.28e-2) −	(3.40e-2) −	(2.35e-2) −	(3.27e-2) −	(9.39e-2) ≈	(9.98e-3)
	10	6.6442e-1	5.7160e-2	5.0647e-1	5.9483e-1	4.2007e-1	1.8497e-1	4.8797e-1	5.4954e-1	1.8280e-1	7.2610e-1	7.0731e-1
		(9.26e-3) −	(1.81e-2) −	(1.35e-2) −	(2.09e-2) −	(3.18e-2) −	(4.65e-2) −	(4.07e-2) −	(3.12e-2) −	(4.47e-2) −	(8.54e-2) ≈	(7.96e-3)
	15	6.6327e-1	9.2958e-2	3.3424e-1	6.0233e-1	6.2209e-1	2.6289e-1	4.7660e-1	6.3875e-1	2.7801e-1	7.7572e-1	7.0985e-1
		(5.65e-3) −	(5.36e-3) −	(1.83e-2) −	(1.59e-2) −	(1.48e-2) −	(5.89e-2) −	(5.46e-2) −	(2.25e-2) −	(4.64e-2) −	(5.88e-2) +	(6.64e-3)
MaF9	3	6.1643e-1	1.1419e-1	2.1689e-1	3.0324e-1	2.2945e-1	2.2493e-1	2.2493e-1	3.2243e-1	3.1467e-1	2.2493e-1	7.2174e-1
		(2.08e-2) −	(1.03e-1) −	(1.64e-2) −	(1.47e-1) −	(5.98e-3) −	(1.69e-16) −	(1.69e-16) −	(4.26e-2) −	(2.28e-2) −	(1.69e-16) −	(1.85e-2)
	5	6.6667e-1	2.4289e-1	5.8030e-1	3.4287e-1	5.4907e-1	1.3444e-1	3.0494e-1	2.8777e-1	3.3848e-1	6.6877e-1	6.9672e-1
		(1.76e-2) −	(1.27e-1) −	(1.74e-2) −	(1.17e-1) −	(2.42e-2) −	(6.93e-2) −	(8.94e-2) −	(9.39e-2) −	(4.81e-2) −	(3.33e-2) −	(1.72e-2)
	8	6.9573e-1	1.5363e-1	5.1105e-1	2.7258e-1	4.7335e-1	1.6760e-1	2.9721e-1	2.3628e-1	4.2052e-1	6.8178e-1	3.5498e-1
		(1.88e-2) +	(9.24e-2) −	(2.70e-2) +	(2.77e-2) −	(5.49e-2) +	(6.08e-2) −	(7.55e-2) −	(8.13e-2) −	(5.10e-2) +	(9.06e-2) +	(4.24e-2)
	10	6.6210e-1	1.0018e-1	4.6158e-1	8.1613e-2	5.3643e-1	1.3226e-1	1.7749e-1	1.8222e-1	3.5078e-1	7.0660e-1	2.9415e-1
		(1.19e-2) +	(6.08e-2) −	(2.94e-2) +	(5.74e-2) −	(1.81e-2) +	(2.58e-2) −	(5.70e-2) −	(7.60e-2) −	(4.92e-2) +	(1.04e-1) +	(1.91e-2)
	15	7.1215e-1	8.7530e-2	3.0368e-1	3.6949e-1	3.9228e-1	1.6946e-1	3.0981e-1	3.8451e-1	4.4339e-1	7.9027e-1	6.8313e-1
		(8.39e-3) ≈	(3.09e-2) −	(2.30e-2) −	(1.82e-1) −	(5.73e-2) −	(8.06e-2) −	(8.94e-2) −	(1.52e-1) −	(6.06e-2) −	(1.42e-1) +	(7.06e-2)

(*continued on next page*)

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Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	6.0063e-1	3.3214e-2	5.3625e-1	5.1652e-1	5.4184e-1	5.2783e-1	5.4728e-1	5.6046e-1	5.3876e-1	5.4155e-1	6.5787e-1
		(1.83e-2) −	(1.63e-2) −	(4.46e-3) −	(1.66e-2) −	(1.12e-2) −	(7.30e-3) −	(7.00e-3) −	(1.35e-2) −	(7.54e-3) −	(1.22e-2) −	(1.54e-2)
MaF10	5	4.9685e-1	6.1677e-2	4.0473e-1	5.0692e-1	4.5230e-1	4.0126e-1	4.1921e-1	5.3991e-1	4.1788e-1	4.8691e-1	5.5512e-1
		(2.50e-2) −	(4.01e-2) −	(7.79e-3) −	(2.30e-2) −	(1.46e-2) −	(1.38e-2) −	(9.60e-3) −	(1.95e-2) −	(9.44e-3) −	(1.37e-2) −	(1.80e-2)
	8	3.4273e-1	1.1704e-1	2.9067e-1	4.3938e-1	3.5455e-1	3.9310e-1	3.1431e-1	4.1702e-1	3.4337e-1	4.1280e-1	4.6648e-1
		(2.47e-2) −	(6.33e-2) −	(1.00e-2) −	(2.35e-2) −	(2.35e-2) −	(2.07e-2) −	(3.02e-2) −	(3.04e-2) −	(3.58e-2) −	(2.04e-2) −	(2.94e-2)
	10	2.6985e-1	1.3379e-1	2.4233e-1	4.7022e-1	3.4520e-1	3.5856e-1	3.4035e-1	3.5694e-1	3.2641e-1	4.2724e-1	4.4970e-1
		(4.03e-2) −	(1.25e-1) −	(8.01e-3) −	(2.17e-2) +	(3.35e-2) −	(1.43e-2) −	(3.94e-2) −	(2.86e-2) −	(2.25e-2) −	(2.49e-2) −	(3.60e-2)
	15	1.9578e-1	3.3090e-1	1.3727e-1	3.8827e-1	2.5580e-1	2.3755e-1	2.6897e-1	1.8467e-1	2.4448e-1	2.9740e-1	2.3944e-1
		(3.85e-2) −	(2.28e-1) ≈	(1.53e-2) −	(3.49e-2) +	(2.01e-2) ≈	(3.21e-2) ≈	(3.60e-2) ≈	(3.41e-2) −	(2.22e-2) ≈	(1.34e-2) +	(7.34e-2)
	3	6.2118e-1	1.4697e-1	5.4865e-1	5.4911e-1	5.9431e-1	5.9050e-1	5.8077e-1	5.8035e-1	5.8880e-1	5.7803e-1	6.2285e-1
		(1.94e-2) ≈	(4.89e-2) −	(8.84e-3) −	(2.67e-2) −	(1.69e-2) −	(4.26e-3) −	(8.22e-3) −	(1.88e-2) −	(6.12e-3) −	(1.29e-2) −	(1.91e-2)
MaF11	5	5.0573e-1	2.1807e-1	4.1238e-1	4.9736e-1	4.5780e-1	3.7396e-1	4.2351e-1	5.1730e-1	4.2981e-1	4.7392e-1	5.2965e-1
		(1.78e-2) −	(5.83e-2) −	(1.43e-2) −	(1.78e-2) −	(1.93e-2) −	(8.92e-3) −	(6.72e-3) −	(2.15e-2) ≈	(2.66e-2) −	(1.68e-2) −	(2.58e-2)
	8	3.6075e-1	1.4750e-1	2.4579e-1	4.1138e-1	3.6484e-1	2.8955e-1	3.6515e-1	4.4829e-1	3.8498e-1	3.6465e-1	4.8115e-1
		(2.49e-2) −	(4.11e-2) −	(7.27e-3) −	(2.59e-2) −	(6.00e-2) −	(5.31e-2) −	(4.60e-2) −	(2.34e-2) −	(3.38e-2) −	(1.66e-2) −	(2.30e-2)
	10	2.7992e-1	1.2121e-1	1.8502e-1	4.0299e-1	2.9357e-1	2.9590e-1	3.7605e-1	3.3579e-1	3.2961e-1	3.6649e-1	4.8100e-1
		(2.08e-2) −	(1.96e-2) −	(5.49e-3) −	(2.74e-2) −	(4.89e-2) −	(3.12e-2) −	(6.67e-2) −	(2.54e-2) −	(3.10e-2) −	(1.65e-2) −	(2.19e-2)
	15	3.9676e-1	1.7088e-1	1.3777e-1	3.1947e-1	2.3059e-1	1.8522e-1	2.6593e-1	1.6028e-1	2.2171e-1	2.6605e-1	3.9719e-1
		(6.16e-2) ≈	(4.98e-2) −	(1.11e-2) −	(3.72e-2) −	(1.49e-2) −	(1.92e-2) −	(2.32e-2) −	(1.15e-2) −	(2.16e-2) −	(1.03e-2) −	(2.94e-2)
	3	6.2677e-1	2.0438e-1	5.2230e-1	6.2238e-1	5.6173e-1	5.4331e-1	5.4456e-1	6.1730e-1	5.6811e-1	5.2439e-1	7.2077e-1
		(2.25e-2) −	(1.98e-1) −	(7.93e-3) −	(2.95e-2) −	(2.43e-2) −	(1.10e-2) −	(1.33e-2) −	(2.35e-2) −	(1.99e-2) −	(9.73e-3) −	(1.48e-2)
MaF12	5	4.9868e-1	2.7550e-1	2.4885e-1	3.4467e-1	2.6508e-1	2.7975e-1	2.7271e-1	3.9267e-1	4.8797e-1	2.7689e-1	6.3857e-1
		(1.89e-2) −	(2.82e-1) −	(1.15e-2) −	(2.00e-2) −	(1.29e-2) −	(4.24e-2) −	(1.35e-2) −	(2.43e-2) −	(2.35e-2) −	(1.92e-2) −	(1.46e-2)
	8	3.3785e-1	3.4152e-1	1.6307e-1	1.8387e-1	1.6644e-1	1.7582e-1	1.9530e-1	3.0499e-1	2.6299e-1	1.9693e-1	5.1551e-1
		(3.69e-2) −	(3.01e-1) −	(1.24e-2) −	(2.25e-2) −	(1.69e-2) −	(1.77e-2) −	(5.18e-2) −	(3.04e-2) −	(2.84e-2) −	(1.59e-2) −	(2.19e-2)
	10	3.2335e-1	6.0430e-1	1.4186e-1	1.6716e-1	2.0381e-1	1.9526e-1	2.0847e-1	2.0068e-1	2.7864e-1	1.8753e-1	5.2686e-1
		(2.83e-2) −	(3.48e-1) ≈	(1.34e-2) −	(2.47e-2) −	(1.46e-2) −	(1.72e-2) −	(4.04e-2) −	(1.91e-2) −	(1.65e-2) −	(1.23e-2) −	(3.03e-2)
	15	3.0478e-1	6.8157e-1	2.5286e-1	2.3703e-1	3.3373e-1	3.4323e-1	3.6349e-1	2.7934e-1	3.3495e-1	3.1447e-1	5.0009e-1
		(2.70e-2) −	(3.17e-1) ≈	(3.10e-2) −	(5.84e-2) −	(1.38e-2) −	(1.25e-2) −	(2.38e-2) −	(1.72e-2) −	(4.79e-2) −	(2.72e-2) −	(1.74e-2)
	3	5.7914e-1	2.7156e-1	5.8157e-1	4.8376e-1	5.7102e-1	5.8365e-1	6.0090e-1	5.1261e-1	6.5282e-1	6.1355e-1	6.2344e-1
		(1.91e-2) −	(1.47e-1) −	(2.01e-2) −	(5.18e-2) −	(1.57e-2) −	(2.29e-2) −	(2.27e-2) −	(5.49e-2) −	(2.09e-2) +	(2.10e-2) ≈	(2.54e-2)
MaF13	5	6.4554e-1	9.3965e-2	5.6545e-1	5.5751e-1	4.0444e-1	2.7381e-1	4.3600e-1	3.2723e-1	4.2444e-1	5.4892e-1	6.5987e-1
		(1.05e-2) −	(5.17e-2) −	(2.55e-2) −	(2.94e-2) −	(2.23e-2) −	(3.72e-2) −	(4.61e-2) −	(7.03e-2) −	(4.33e-2) −	(4.51e-2) −	(1.99e-2)
	8	6.7511e-1	8.1544e-2	5.0485e-1	5.4873e-1	2.7302e-1	2.4667e-1	4.2468e-1	1.4003e-1	2.3820e-1	6.0133e-1	6.5799e-1
		(1.20e-2) +	(1.82e-2) −	(2.63e-2) −	(2.95e-2) −	(2.73e-2) −	(4.02e-2) −	(4.83e-2) −	(6.94e-2) −	(4.99e-2) −	(1.18e-1) −	(2.56e-2)
	10	6.7758e-1	7.9959e-2	4.7224e-1	5.5095e-1	2.4376e-1	2.2009e-1	4.2520e-1	7.1696e-2	1.7894e-1	5.7208e-1	6.7372e-1
		(1.49e-2) ≈	(2.30e-2) −	(2.53e-2) −	(3.47e-2) −	(2.62e-2) −	(5.00e-2) −	(5.80e-2) −	(2.04e-2) −	(5.23e-2) −	(1.15e-1) −	(2.06e-2)
	15	6.7264e-1	1.1779e-1	2.9350e-1	5.4427e-1	2.3590e-1	1.7121e-1	3.0776e-1	9.0043e-2	1.6903e-1	5.4257e-1	6.7243e-1
		(2.16e-2) ≈	(3.98e-2) −	(2.64e-2) −	(3.51e-2) −	(3.89e-2) −	(5.77e-2) −	(7.53e-2) −	(4.70e-2) −	(5.08e-2) −	(1.50e-1) −	(2.74e-2)
	3	6.4968e-1	3.0711e-1	3.4678e-1	5.0900e-1	3.7867e-1	1.5123e-1	5.0233e-1	4.8048e-1	2.2970e-1	4.7181e-1	6.3843e-1
		(2.21e-2) ≈	(9.86e-2) −	(1.10e-2) −	(8.79e-2) −	(1.02e-2) −	(3.03e-2) −	(3.11e-2) −	(2.86e-2) −	(2.03e-2) −	(1.20e-1) −	(2.02e-2)
IDTLZ1	5	4.2049e-1	2.2513e-1	3.4990e-1	4.5367e-1	1.2296e-1	1.1043e-1	3.1367e-1	2.2365e-1	2.5735e-1	5.6732e-1	4.5418e-1
		(5.89e-2) −	(8.59e-2) −	(5.31e-2) −	(4.84e-2) ≈	(2.46e-2) −	(5.88e-2) −	(4.45e-2) −	(4.27e-2) −	(4.87e-2) −	(7.42e-2) +	(4.22e-2)
	8	3.8652e-1	1.9797e-1	2.1549e-1	4.0245e-1	2.5940e-1	3.1835e-1	3.4439e-1	2.7985e-1	2.5685e-1	3.9273e-1	3.2218e-1
		(5.10e-2) +	(4.07e-2) −	(2.71e-2) −	(5.07e-2) +	(4.48e-2) −	(2.16e-2) −	(2.28e-2) +	(2.05e-2) ≈	(4.39e-2) −	(6.53e-2) +	(9.70e-2)
	10	3.1093e-1	1.5593e-1	1.8863e-1	4.2704e-1	2.4582e-1	2.3925e-1	3.3813e-1	2.7970e-1	2.3994e-1	4.3747e-1	5.4027e-1
		(3.31e-2) −	(7.56e-2) −	(9.96e-3) −	(3.96e-2) −	(6.43e-2) −	(3.09e-2) −	(2.93e-2) −	(6.07e-2) −	(4.95e-2) −	(5.99e-2) −	(4.64e-2)
	15	3.1238e-1	1.7057e-1	1.9202e-1	3.3292e-1	2.3381e-1	2.5451e-1	2.6531e-1	2.0250e-1	2.2792e-1	4.5176e-1	3.9400e-1
		(3.33e-2) −	(1.02e-2) −	(2.61e-2) −	(2.77e-2) −	(3.40e-2) −	(2.05e-2) −	(1.72e-2) −	(2.44e-2) −	(3.72e-2) −	(9.40e-2) +	(6.94e-2)
	3	6.7461e-1	1.4390e-1	5.1637e-1	7.0716e-1	5.7729e-1	5.0668e-1	5.4393e-1	5.7268e-1	5.6755e-1	5.7632e-1	7.3478e-1
		(2.40e-2) −	(2.84e-2) −	(5.88e-3) −	(2.04e-2) −	(1.71e-2) −	(2.00e-2) −	(2.16e-2) −	(1.96e-2) −	(4.02e-2) −	(1.00e-2) −	(1.72e-2)
IDTLZ2	5	6.0681e-1	1.8306e-1	4.6902e-1	6.2126e-1	3.8225e-1	4.7134e-1	5.3124e-1	2.9908e-1	3.4367e-1	3.4952e-1	6.5442e-1
		(1.79e-2) −	(2.10e-2) −	(1.73e-2) −	(2.04e-2) −	(2.05e-2) −	(4.63e-2) −	(2.53e-2) −	(2.16e-2) −	(5.38e-2) −	(2.92e-2) −	(1.16e-2)
	8	5.0059e-1	1.2843e-1	2.9396e-1	4.3785e-1	3.7916e-1	2.8558e-1	3.7024e-1	1.8125e-1	2.8031e-1	3.7529e-1	5.3076e-1
		(2.35e-2) −	(2.04e-2) −	(3.30e-2) −	(3.32e-2) −	(2.41e-2) −	(3.58e-2) −	(4.16e-2) −	(1.24e-2) −	(3.13e-2) −	(5.16e-2) −	(2.58e-2)
	10	4.8055e-1	7.9457e-2	4.0697e-1	4.3650e-1	2.0972e-1	2.3103e-1	3.2858e-1	1.8538e-1	2.6380e-1	3.6322e-1	5.3283e-1
		(2.25e-2) −	(1.85e-2) −	(3.63e-2) −	(2.72e-2) −	(3.38e-2) −	(2.49e-2) −	(2.45e-2) −	(9.85e-3) −	(2.96e-2) −	(9.65e-2) −	(2.07e-2)
	15	4.2436e-1	1.4776e-1	2.0142e-1	4.0241e-1	1.6959e-1	1.9282e-1	1.6675e-1	1.5250e-1	2.0828e-1	4.3392e-1	4.9650e-1
		(2.39e-2) −	(1.01e-2) −	(5.35e-2) −	(3.19e-2) −	(2.32e-2) −	(2.08e-2) −	(1.76e-2) −	(1.06e-2) −	(2.91e-2) −	(9.26e-2) −	(1.94e-2)
$+/-/\approx$		7/59/9	0/72/3	2/72/1	4/70/1	3/71/1	1/73/1	2/72/1	0/72/3	6/67/2	11/58/6	

TABLE X: Mean and standard deviation of the PD values obtained by MaOEAIH and other MaOEAs for DTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	4.7609e+4	1.6957e+3	1.1867e+4	6.0102e+4	1.2732e+4	1.4079e+4	1.2335e+4	5.4670e+4	1.3080e+4	1.4772e+4	7.1455e+4
		(2.67e+3) −	(3.37e+3) −	(1.14e+3) −	(3.93e+4) −	(2.09e+3) −	(2.48e+3) −	(1.27e+3) −	(1.05e+4) −	(2.15e+3) −	(2.46e+3) −	(4.45e+3)
DTLZ1	5	7.1346e+5	5.4361e+5	7.9967e+5	3.5978e+6	7.5117e+5	8.4639e+5	7.8581e+5	5.2618e+6	8.2172e+5	8.9572e+5	5.7341e+6
		(2.07e+5) −	(9.16e+5) −	(3.58e+4) −	(1.85e+6) −	(5.05e+4) −	(5.56e+4) −	(9.53e+4) −	(1.19e+6) ≈	(4.90e+4) −	(6.89e+4) −	(6.58e+5)
	8	2.5171e+6	5.0125e+7	5.0924e+7	4.3969e+9	4.7527e+7	4.9893e+7	4.9784e+7	2.3198e+8	7.0229e+7	5.6346e+7	9.5874e+7
		(1.92e+6) −	(9.93e+7) −	(1.42e+6) −	(5.79e+9) +	(6.87e+5) −	(1.04e+6) −	(1.10e+6) −	(1.06e+8) +	(4.62e+6) −	(8.07e+6) −	(1.71e+7)
	10	4.9343e+6	2.4339e+8	3.7289e+8	2.9430e+11	3.2702e+8	3.4469e+8	3.4313e+8	3.9572e+8	5.4100e+8	3.6428e+8	4.1090e+8
		(6.01e+6) −	(5.08e+8) −	(1.27e+7) ≈	(1.49e+11) +	(2.30e+6) −	(5.43e+6) ≈	(5.47e+6) ≈	(4.71e+8) −	(6.33e+7) +	(9.53e+6) ≈	(2.24e+8)
	15	2.6711e+9	1.0922e+9	2.8176e+10	1.0438e+13	1.1426e+10	3.8621e+10	2.6383e+10	3.5806e+9	8.3536e+11	1.2003e+10	1.2120e+10
		(2.63e+9) −	(2.81e+9) −	(1.05e+10) +	(2.75e+12) +	(2.16e+9) ≈	(6.89e+10) ≈	(5.24e+10) ≈	(8.10e+9) −	(6.85e+11) +	(7.47e+7) ≈	(8.45e+9)
	3	1.2591e+5	9.8008e+3	8.7469e+4	1.0307e+5	9.7838e+4	9.8861e+4	9.9986e+4	1.3490e+5	9.4714e+4	9.1530e+4	2.0304e+5
		(9.66e+3) −	(7.77e+3) −	(3.67e+3) −	(1.09e+4) −	(4.60e+3) −	(1.37e+4) −	(1.25e+4) −	(4.59e+3) −	(3.17e+3) −	(2.73e+3) −	(8.09e+3)
DTLZ2	5	4.1644e+6	2.9801e+6	2.6003e+6	3.0066e+6	2.0369e+6	2.7233e+6	2.6836e+6	8.2012e+6	2.5521e+6	2.2469e+6	2.4674e+7
		(1.26e+6) −	(5.53e+5) −	(3.90e+5) −	(8.54e+5) −	(8.56e+4) −	(4.53e+5) −	(4.82e+5) −	(6.62e+5) −	(1.17e+5) −	(1.12e+5) −	(1.85e+6)
	8	2.8672e+7	2.5510e+8	2.3311e+8	2.1345e+7	6.2877e+8	2.0484e+8	3.5416e+8	8.6947e+8	3.2941e+8	1.8548e+8	7.7284e+8
		(2.21e+7) −	(3.83e+7) −	(1.28e+7) −	(1.17e+7) −	(1.01e+8) −	(1.25e+7) −	(3.07e+8) −	(6.63e+7) +	(2.90e+7) −	(3.02e+6) −	(1.03e+8)
	10	4.5845e+7	2.6035e+7	1.6677e+9	3.8289e+7	1.1042e+9	8.8348e+8	7.8393e+8	1.8839e+9	9.0123e+8	8.8511e+8	3.2700e+9
		(4.10e+7) −	(1.40e+8) −	(8.44e+8) −	(3.28e+7) −	(3.83e+8) −	(2.26e+7) −	(2.66e+8) −	(4.30e+8) −	(3.22e+8) −	(2.06e+7) −	(8.01e+8)
	15	7.3863e+7	1.9922e+10	5.4977e+10	1.4665e+8	6.7354e+10	4.5226e+10	9.5053e+10	7.8119e+9	3.9521e+10	3.8371e+10	5.4451e+10
		(1.21e+8) −	(2.21e+10) −	(2.79e+10) +	(1.01e+8) −	(1.80e+10) +	(2.80e+10) −	(3.08e+10) +	(7.01e+9) −	(9.73e+9) −	(1.72e+10) −	(1.78e+10)
	3	1.2090e+5	1.6661e+4	9.8164e+4	9.1519e+4	9.9815e+4	9.3609e+4	9.2501e+4	1.2490e+5	9.8670e+4	9.5278e+4	2.0940e+5
		(8.64e+3) −	(1.75e+4) −	(5.24e+3) −	(2.37e+4) −	(5.72e+3) −	(4.68e+3) −	(3.90e+3) −	(2.68e+4) −	(3.49e+3) −	(3.77e+3) −	(7.43e+3)
DTLZ3	5	3.7267e+6	1.8735e+5	3.1501e+6	9.4955e+6	2.2547e+6	2.1844e+6	2.1955e+6	1.1306e+7	2.8487e+6	2.3181e+6	2.3642e+7
		(1.12e+6) −	(5.21e+5) −	(1.33e+6) −	(1.03e+7) −	(1.39e+5) −	(1.46e+5) −	(1.47e+5) −	(3.72e+6) −	(1.35e+5) −	(1.41e+5) −	(4.46e+6)
	8	2.2706e+7	2.8766e+7	4.4631e+8	7.4677e+10	5.9085e+8	2.2167e+8	1.8796e+8	7.6954e+8	3.7583e+8	1.9043e+8	6.3489e+8
		(1.56e+7) −	(1.20e+8) −	(2.83e+8) −	(4.39e+10) +	(6.99e+7) ≈	(1.98e+8) −	(6.04e+7) −	(7.49e+8) ≈	(3.28e+7) −	(3.56e+6) −	(2.36e+8)
	10	5.2774e+7	5.8349e+6	6.8046e+8	2.4714e+12	1.3951e+9	9.5869e+8	2.5480e+9	9.8124e+9	1.0233e+9	9.1278e+8	3.1884e+9
		(5.51e+7) −	(2.60e+7) −	(5.57e+8) −	(9.31e+11) +	(4.51e+8) −	(3.28e+8) −	(3.81e+9) −	(6.11e+9) +	(7.35e+8) −	(2.83e+7) −	(1.63e+9)
	15	1.9518e+8	7.2235e+8	8.4985e+10	6.3723e+13	5.6880e+10	7.0850e+10	2.1362e+11	2.8986e+11	2.4718e+12	4.6256e+10	6.2755e+10
		(3.91e+8) −	(2.29e+9) −	(5.70e+10) +	(2.20e+13) +	(2.28e+10) −	(2.26e+11) +	(2.28e+11) +	(3.90e+11) +	(3.15e+12) +	(3.12e+10) ≈	(8.55e+10)
	3	8.7947e+4	7.9624e+3	7.0965e+4	1.0427e+5	6.6657e+4	1.0172e+5	1.2071e+5	1.3747e+5	9.9880e+4	8.7796e+4	1.9783e+5
		(5.81e+4) −	(7.97e+3) −	(4.71e+4) −	(8.64e+3) −	(4.37e+4) −	(4.18e+4) −	(1.10e+4) −	(3.46e+3) −	(3.86e+3) −	(2.36e+4) −	(9.09e+3)
DTLZ4	5	2.5146e+6	2.2438e+6	3.3915e+6	1.9869e+6	1.2942e+6	3.4142e+6	3.1439e+6	7.1277e+6	3.1285e+6	2.3044e+6	1.6959e+7
		(1.68e+6) −	(1.46e+6) −	(4.33e+5) −	(7.67e+5) −	(9.71e+5) −	(4.84e+5) −	(1.40e+6) −	(4.08e+5) −	(2.62e+5) −	(3.88e+5) −	(1.79e+6)
	8	1.2827e+7	1.4311e+8	2.5871e+8	1.5956e+6	4.4161e+8	2.0819e+8	1.6269e+8	8.0883e+8	3.6758e+8	1.8920e+8	1.6308e+8
		(8.76e+6) −	(8.20e+7) ≈	(1.37e+7) +	(1.01e+6) −	(1.78e+8) +	(9.04e+6) +	(1.32e+8) ≈	(5.40e+7) +	(4.88e+7) +	(6.28e+7) ≈	(4.66e+7)
	10	1.4000e+7	5.0904e+8	1.5179e+9	1.6547e+6	6.5789e+8	9.1762e+8	5.1100e+8	2.4734e+8	6.1006e+8	9.0250e+8	4.9323e+8
		(1.20e+7) −	(4.75e+8) ≈	(2.14e+8) +	(9.41e+5) −	(4.29e+8) ≈	(2.61e+7) +	(5.07e+8) ≈	(3.01e+8) −	(2.01e+8) +	(3.70e+8) +	(1.49e+8)
	15	4.8546e+7	3.6628e+9	6.7363e+10	3.8194e+5	1.5033e+10	3.4251e+10	1.7493e+10	1.0549e+9	2.6509e+10	1.7818e+10	5.1492e+9
		(7.64e+7) −	(4.10e+9) −	(3.20e+10) +	(8.96e+5) −	(1.84e+10) ≈	(2.96e+8) +	(2.08e+10) ≈	(2.69e+9) −	(1.28e+10) +	(2.50e+10) ≈	(2.07e+9)
	3	6.0262e+4	1.7527e+4	7.5273e+4	6.9413e+4	6.8926e+4	6.0031e+4	6.7020e+4	6.5420e+4	1.4332e+5	3.3407e+5	7.0850e+4
		(7.02e+3) −	(2.20e+4) −	(9.24e+3) ≈	(8.64e+3) ≈	(1.11e+4) ≈	(7.49e+3) −	(9.42e+3) ≈	(1.30e+4) −	(2.56e+4) +	(2.03e+4) +	(9.47e+3)
DTLZ5	5	2.1848e+7	1.6023e+6	3.9586e+7	3.5006e+7	1.8470e+7	1.8019e+7	2.7381e+7	3.3888e+7	6.8723e+7	3.7461e+7	3.6171e+7
		(1.36e+6) −	(2.22e+6) −	(3.18e+6) +	(2.64e+6) ≈	(1.83e+6) −	(3.22e+6) −	(2.61e+6) −	(3.98e+6) −	(6.53e+6) +	(2.30e+6) ≈	(3.12e+6)
	8	1.7183e+9	5.8321e+7	3.9472e+9	3.7690e+9	2.0850e+9	1.6555e+9	3.3888e+9	3.4594e+9	2.5372e+9	8.9192e+8	3.4036e+9
		(2.94e+8) −	(1.12e+8) −	(2.56e+8) +	(4.11e+8) +	(2.42e+8) −	(2.62e+8) −	(4.00e+8) ≈	(4.87e+8) ≈	(6.48e+8) −	(9.82e+8) −	(1.34e+9)
	10	1.4262e+10	5.4341e+8	2.3201e+10	3.5062e+10	1.2830e+10	9.9942e+9	1.9339e+10	1.4317e+10	2.7432e+10	1.5126e+10	2.0672e+10
		(2.15e+9) −	(9.14e+8) −	(2.00e+9) +	(4.80e+9) +	(1.64e+9) −	(1.93e+9) −	(3.16e+9) ≈	(3.68e+9) −	(4.44e+9) +	(6.76e+9) −	(4.36e+9)
	15	1.5456e+11	1.4714e+9	2.7394e+11	2.1093e+12	1.4511e+11	6.3996e+10	4.5238e+11	2.5025e+11	5.1425e+11	1.7070e+10	4.9438e+11
		(3.09e+10) −	(1.13e+7) −	(6.61e+10) −	(5.34e+11) +	(7.04e+10) −	(3.00e+10) −	(1.55e+11) ≈	(1.26e+11) −	(8.62e+10) ≈	(2.23e+10) −	(1.68e+11)
	3	5.8972e+4	1.1059e+4	7.1798e+4	7.6602e+4	6.7362e+4	5.3816e+4	6.5231e+4	4.6819e+4	4.5425e+5	4.7593e+5	7.6086e+4
		(4.65e+3) −	(1.90e+4) −	(6.35e+3) ≈	(7.79e+3) ≈	(7.58e+3) −	(6.52e+3) −	(6.96e+3) −	(3.54e+3) −	(4.54e+4) +	(2.18e+4) +	(9.08e+3)
DTLZ6	5	2.1288e+7	8.5448e+5	4.5069e+7	3.7427e+7	1.9137e+7	3.1732e+7	3.9012e+7	5.2406e+7	9.9564e+7	6.8114e+7	1.7339e+7
		(2.12e+6) +	(1.34e+6) −	(4.08e+6) +	(4.79e+6) +	(2.96e+6) +	(5.73e+6) +	(5.91e+6) +	(6.38e+6) +	(1.56e+7) +	(4.71e+6) +	(6.67e+6)
	8	2.4317e+9	2.6209e+7	3.5339e+9	6.0046e+9	2.4132e+9	2.1745e+9	5.6716e+9	7.9350e+9	4.8324e+9	5.0803e+9	1.5892e+9
		(2.71e+8) +	(3.46e+7) −	(4.85e+8) +	(1.29e+9) +	(4.99e+8) +	(3.31e+8) +	(1.00e+9) +	(1.16e+9) +	(8.78e+8) +	(6.47e+8) +	(2.99e+8)
	10	1.8584e+10	8.1004e+7	1.9593e+10	6.4894e+10	1.7158e+10	1.3641e+10	3.8052e+10	1.5169e+10	5.7330e+10	2.5083e+10	1.3172e+10
		(2.06e+9) +	(9.26e+7) −	(4.21e+9) +	(6.65e+9) +	(2.62e+9) +	(3.25e+9) ≈	(8.84e+9) +	(5.40e+9) ≈	(1.21e+10) +	(3.34e+9) +	(2.34e+9)
	15	1.7868e+11	1.3299e+9	1.2707e+11	2.7768e+12	1.0412e+11	2.2223e+11	6.4114e+11	3.7169e+11	1.3276e+12	4.0261e+11	5.7473e+11
		(2.95e+10) −	(7.20e+8) −	(6.50e+10) −	(5.05e+11) +	(4.35e+10) −	(9.44e+10) −	(2.29e+11) ≈	(1.92e+11) −	(2.52e+11) +	(3.72e+11) −	(1.85e+11)
	3	1.1929e+5	1.2287e+4	1.3363e+5	1.3243e+5	1.0419e+5	9.1399e+4	1.2338e+5	1.3340e+5	1.0636e+5	1.7477e+5	1.5167e+5
		(2.29e+4) −	(1.10e+4) −	(3.33e+4) −	(1.36e+4) −	(5.38e+4) −	(2.28e+4) −	(1.55e+4) −	(2.31e+4) −	(2.33e+4) −	(5.70e+3) +	(1.09e+4)
DTLZ7	5	9.8127e+6	1.2439e+6	2.4031e+7	1.7326e+7	2.7818e+7	7.4822e+6	2.0808e+7	3.2820e+7	3.4329e+6	1.2594e+7	2.2874e+7
		(2.47e+6) −	(1.28e+6) −	(3.54e+6) ≈	(3.15e+6) −	(4.38e+6) +	(1.58e+6) −	(2.26e+6) −	(2.57e+6) +	(2.09e+6) −	(4.23e+5) −	(2.48e+6)
	8	5.2624e+8	9.0533e+7	1.2875e+9	5.7556e+8	1.5102e+9	7.7047e+8	1.0645e+9	1.5427e+9	4.7024e+8	1.3679e+9	2.8004e+9
		(1.75e+8) −	(1.54e+8) −	(2.93e+8) −	(1.80e+8) −	(1.33e+8) −	(1.62e+8) −	(1.28e+8) −	(1.31e+8) −	(1.49e+8) −	(1.09e+8) −	(2.74e+8)
	10	3.6385e+9	9.2764e+8	7.9475e+9	9.4797e+9	8.8305e+9	6.5317e+9	5.8032e+9	8.3047e+9	5.6418e+9	9.9654e+9	2.2308e+10
		(2.17e+9) −	(1.78e+9) −	(2.22e+9) −	(1.94e+9) −	(1.10e+9) −	(1.55e+9) −	(1.79e+9) −	(1.61e+9) −	(1.59e+9) −	(1.30e+9) −	(1.75e+9)
	15	2.0547e+11	1.9003e+11	6.1201e+11	3.6997e+11	3.4596e+10	1.2045e+10	5.9016e+10	9.1391e+10	4.9856e+10	5.8580e+11	1.1787e+12
		(6.50e+10) −	(3.74e+10) −	(5.68e+10) −	(8.34e+10) −	(3.83e+10) −	(4.79e+9) −	(2.29e+10) −	(2.07e+10) −	(1.45e+10) −	(3.14e+10) −	(1.58e+11)
+/ − / ≈		3/32/0	0/33/2	12/19/4	13/19/3	6/24/5	6/26/3	5/20/10	8/23/4	14/20/1	7/22/6	

TABLE XI: Mean and standard deviation of the PD values obtained by MaOEAIH and other MaOEAs for WFG test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	2.3202e+5	1.8662e+4	2.7394e+5	2.7175e+5	3.1781e+5	3.4402e+5	2.7064e+5	2.6376e+5	2.5462e+5	3.1164e+5	3.5782e+5
		(1.95e+4) −	(2.08e+4) −	(2.26e+4) −	(2.70e+4) −	(1.62e+4) −	(1.62e+4) −	(1.42e+4) −	(2.43e+4) −	(9.03e+3) −	(1.44e+4) −	(1.69e+4)
WFG1	5	4.0588e+6	2.0495e+6	1.5833e+7	3.6413e+7	2.2357e+7	3.8271e+7	1.2837e+7	4.5865e+7	9.9957e+6	3.5068e+7	4.4391e+7
		(2.31e+6) −	(2.58e+6) −	(2.53e+6) −	(5.11e+6) −	(2.39e+6) −	(2.06e+6) −	(2.02e+6) −	(7.29e+6) ≈	(9.71e+5) −	(1.97e+6) −	(1.12e+7)
	8	2.1896e+8	1.5129e+8	9.3847e+8	2.9101e+9	5.5853e+7	1.0572e+9	7.3724e+8	3.4576e+9	7.1802e+8	1.3613e+9	2.8209e+9
		(1.88e+8) −	(2.42e+8) −	(8.24e+7) −	(4.11e+8) ≈	(3.81e+7) −	(1.81e+8) −	(1.44e+8) −	(5.05e+8) +	(2.26e+8) −	(2.73e+8) −	(4.65e+8)
	10	1.7629e+9	9.7698e+8	3.8267e+9	2.6741e+10	3.6272e+9	6.7876e+9	5.2968e+9	1.0877e+10	3.3077e+9	8.5698e+9	1.7672e+10
		(1.98e+9) −	(1.68e+9) −	(6.14e+8) −	(6.98e+9) +	(4.95e+9) −	(1.85e+9) −	(2.89e+9) −	(2.30e+9) −	(1.35e+9) −	(1.17e+9) −	(3.95e+9)
	15	1.0011e+11	2.6718e+10	1.2608e+11	1.6031e+12	1.4587e+8	1.4799e+11	1.5129e+11	8.9427e+10	9.9207e+10	1.3653e+11	4.6850e+11
		(1.12e+11) −	(6.33e+10) −	(1.80e+10) −	(5.12e+11) +	(9.97e+7) −	(4.75e+10) −	(7.51e+10) −	(1.29e+11) −	(5.04e+10) −	(2.02e+10) −	(1.87e+11)
	3	2.1759e+5	6.3522e+4	3.1362e+5	3.1188e+5	3.8913e+5	3.7535e+5	3.1044e+5	4.2489e+5	2.2615e+5	3.7572e+5	4.5327e+5
		(1.93e+4) −	(1.49e+4) −	(2.72e+4) −	(2.34e+4) −	(1.77e+4) −	(1.69e+4) −	(1.91e+4) −	(2.73e+4) −	(1.85e+4) −	(1.08e+4) −	(2.82e+4)
WFG2	5	8.0212e+6	2.3077e+6	1.5959e+7	6.3698e+7	4.7335e+7	3.2202e+7	1.5322e+7	6.6340e+7	1.1767e+7	3.9876e+7	5.7901e+7
		(3.05e+6) −	(1.42e+6) −	(1.70e+6) −	(4.33e+6) +	(4.53e+6) −	(1.46e+6) −	(1.93e+6) −	(5.34e+6) +	(2.18e+6) −	(2.14e+6) −	(4.45e+6)
	8	2.0273e+8	2.2658e+8	6.7671e+8	5.9678e+9	3.3992e+8	1.3646e+9	1.5201e+9	4.6601e+9	6.5311e+8	1.9731e+9	3.9746e+9
		(1.36e+8) −	(1.44e+8) −	(6.43e+7) −	(4.90e+8) +	(3.88e+8) −	(3.27e+8) −	(1.04e+9) −	(5.41e+8) +	(2.54e+8) −	(9.45e+7) −	(2.55e+8)
	10	7.3603e+8	1.1692e+9	3.6296e+9	4.5449e+10	2.5353e+8	1.0254e+10	1.0179e+10	1.9224e+10	4.8660e+9	1.0009e+10	2.8946e+10
		(5.58e+8) −	(5.61e+8) −	(3.03e+8) −	(3.00e+9) +	(4.10e+8) −	(2.64e+9) −	(6.24e+9) −	(2.19e+9) −	(2.40e+9) −	(7.77e+8) −	(2.49e+9)
	15	5.5143e+11	2.1171e+10	1.4481e+11	1.8769e+12	3.2656e+8	1.0916e+11	2.1786e+11	1.2991e+11	1.2291e+11	1.4087e+11	9.5329e+11
		(3.36e+11) −	(2.12e+10) −	(5.02e+10) −	(4.24e+11) +	(3.87e+8) −	(3.22e+10) −	(6.78e+10) −	(7.98e+10) −	(4.42e+10) −	(6.41e+9) −	(1.12e+11)
	3	4.3863e+5	5.4648e+2	4.7129e+5	4.3537e+5	3.1661e+5	3.1862e+5	3.8855e+5	3.8022e+5	3.4663e+5	4.2986e+5	4.6660e+5
		(2.72e+4) −	(4.92e+2) −	(3.46e+4) ≈	(3.46e+4) −	(2.17e+4) −	(4.38e+4) −	(3.96e+4) −	(3.07e+4) −	(5.48e+4) −	(2.15e+4) −	(2.73e+4)
WFG3	5	1.3959e+8	2.5596e+5	1.4584e+8	1.3701e+8	8.9178e+7	8.0206e+7	1.0528e+8	1.1434e+8	1.0358e+8	9.5684e+7	1.5840e+8
		(4.99e+6) −	(1.59e+5) −	(1.12e+7) −	(8.29e+6) −	(4.23e+6) −	(4.54e+6) −	(5.50e+6) −	(7.58e+6) −	(9.25e+6) −	(3.82e+6) −	(7.60e+6)
	8	9.3268e+9	6.1003e+7	1.1426e+10	1.6684e+10	5.3670e+9	6.9909e+9	8.2355e+9	7.8974e+9	6.5667e+9	4.9634e+9	1.4565e+10
		(7.51e+8) −	(3.42e+7) −	(1.58e+9) −	(8.37e+8) +	(3.56e+8) −	(1.75e+9) −	(1.34e+9) −	(8.63e+8) −	(1.98e+9) −	(6.84e+8) −	(7.64e+8)
	10	7.7212e+10	7.1117e+8	5.8298e+10	1.5064e+11	3.9636e+10	5.8046e+10	5.5320e+10	4.1809e+10	6.7385e+10	3.3011e+10	1.0599e+11
		(9.66e+9) −	(3.53e+8) −	(5.42e+9) −	(8.72e+9) +	(3.30e+9) −	(1.00e+10) −	(1.60e+10) −	(4.48e+9) −	(1.17e+10) −	(2.06e+9) −	(1.14e+10)
	15	3.1718e+12	5.4194e+10	2.5593e+12	7.3261e+12	1.5880e+12	2.2317e+12	2.3003e+12	1.1915e+12	2.3015e+12	1.3983e+12	5.5279e+12
		(5.44e+11) −	(3.05e+10) −	(4.56e+11) −	(5.61e+11) +	(9.59e+10) −	(3.30e+11) −	(3.80e+11) −	(1.53e+11) −	(5.80e+11) −	(2.00e+11) −	(2.06e+12)
	3	4.5253e+5	6.6564e+3	4.0661e+5	5.1378e+5	4.0096e+5	4.0348e+5	4.0158e+5	5.2117e+5	4.1633e+5	5.0294e+5	8.1186e+5
		(3.07e+4) −	(1.20e+4) −	(3.67e+4) −	(2.97e+4) −	(2.08e+4) −	(1.85e+4) −	(1.39e+4) −	(1.71e+4) −	(1.45e+4) −	(1.27e+4) −	(2.47e+4)
WFG4	5	4.6540e+7	2.0339e+5	1.9040e+7	5.7565e+7	1.8960e+7	1.8220e+7	1.8168e+7	7.0369e+7	2.3615e+7	2.9198e+7	1.9735e+8
		(7.01e+6) −	(4.60e+5) −	(2.08e+6) −	(7.45e+6) −	(1.31e+6) −	(1.38e+6) −	(1.61e+6) −	(3.63e+6) −	(1.72e+6) −	(2.57e+6) −	(7.61e+6)
	8	2.7634e+9	1.6951e+7	3.4662e+9	2.6515e+9	6.1953e+9	2.6181e+9	2.8893e+9	8.2759e+9	4.0531e+9	3.8066e+9	2.8499e+10
		(6.20e+8) −	(3.04e+7) −	(2.56e+8) −	(7.58e+8) −	(6.34e+8) −	(1.89e+8) −	(2.39e+8) −	(5.73e+8) −	(3.42e+8) −	(2.56e+8) −	(1.14e+9)
	10	3.0059e+10	1.3644e+8	1.4090e+10	7.1128e+9	1.9680e+10	1.1015e+10	1.1646e+10	2.4646e+10	1.1695e+10	1.7130e+10	3.1400e+11
		(1.14e+10) −	(1.70e+8) −	(1.26e+9) −	(3.05e+9) −	(3.69e+9) −	(6.97e+8) −	(7.92e+8) −	(2.90e+9) −	(2.72e+9) −	(1.60e+9) −	(1.08e+10)
	15	1.0020e+12	5.6722e+9	1.0132e+12	9.8732e+10	1.1443e+12	6.1486e+11	9.4421e+11	8.4542e+11	7.7756e+11	7.1935e+11	2.6247e+13
		(4.29e+11) −	(3.09e+9) −	(2.39e+11) −	(6.89e+10) −	(2.69e+11) −	(3.78e+10) −	(5.74e+11) −	(1.42e+11) −	(3.64e+11) −	(1.65e+11) −	(1.70e+12)
	3	4.6004e+5	4.6896e+4	3.4746e+5	4.9593e+5	3.7769e+5	3.6802e+5	3.7798e+5	5.5473e+5	3.8641e+5	4.3636e+5	8.6624e+5
		(3.12e+4) −	(2.27e+4) −	(1.48e+4) −	(3.09e+4) −	(2.18e+4) −	(1.94e+4) −	(1.79e+4) −	(1.56e+4) −	(2.10e+4) −	(1.38e+4) −	(2.67e+4)
WFG5	5	4.4337e+7	2.2443e+5	1.5612e+7	5.9599e+7	1.3167e+7	1.4637e+7	1.4725e+7	7.6726e+7	1.9905e+7	2.0730e+7	2.4012e+8
		(6.25e+6) −	(8.87e+5) −	(2.98e+6) −	(6.03e+6) −	(6.23e+5) −	(9.30e+5) −	(8.13e+5) −	(4.20e+6) −	(2.48e+6) −	(1.57e+6) −	(9.80e+6)
	8	2.8890e+9	2.8313e+6	1.8329e+9	2.1303e+9	4.3073e+9	1.4815e+9	1.5108e+9	7.6585e+9	2.6048e+9	2.9698e+9	3.4141e+10
		(1.02e+9) −	(4.49e+6) −	(1.31e+8) −	(6.39e+8) −	(4.64e+8) −	(3.38e+7) −	(9.79e+7) −	(5.46e+8) −	(3.83e+8) −	(2.44e+8) −	(1.02e+9)
	10	3.1788e+10	4.9644e+7	1.2319e+10	7.6881e+9	2.2199e+10	8.4288e+9	8.4622e+9	2.6886e+10	1.0702e+10	1.5923e+10	3.6798e+11
		(8.15e+9) −	(1.05e+8) −	(1.31e+9) −	(2.29e+9) −	(3.66e+9) −	(2.41e+8) −	(2.20e+8) −	(2.67e+9) −	(8.59e+8) −	(1.06e+9) −	(1.24e+10)
	15	8.8851e+11	7.7311e+8	7.1043e+11	9.1605e+10	1.6362e+12	5.7097e+11	8.3210e+11	9.7677e+11	7.9178e+11	1.0371e+12	2.7671e+13
		(3.57e+11) −	(5.67e+8) −	(1.06e+11) −	(4.00e+10) −	(1.76e+11) −	(3.14e+11) −	(8.17e+11) −	(2.19e+11) −	(3.89e+11) −	(1.50e+11) −	(6.14e+11)
	3	4.4316e+5	6.7018e+4	3.6472e+5	4.3014e+5	3.7747e+5	3.5380e+5	3.4879e+5	5.4721e+5	3.6165e+5	4.3287e+5	7.6035e+5
		(2.59e+4) −	(1.41e+5) −	(3.94e+4) −	(3.57e+4) −	(2.96e+4) −	(3.68e+4) −	(2.17e+4) −	(1.95e+4) −	(3.34e+4) −	(1.27e+4) −	(2.51e+4)
WFG6	5	3.6769e+7	1.3209e+6	1.5350e+7	4.6576e+7	1.3420e+7	1.3287e+7	1.3834e+7	7.4712e+7	1.4807e+7	2.1173e+7	2.0696e+8
		(6.21e+6) −	(1.38e+6) −	(4.47e+6) −	(8.26e+6) −	(1.63e+6) −	(2.32e+6) −	(2.73e+6) −	(3.47e+6) −	(1.04e+6) −	(2.01e+6) −	(1.19e+7)
	8	1.6145e+9	5.6581e+8	1.8664e+9	1.4392e+9	5.6393e+9	1.4875e+9	1.5401e+9	8.6080e+9	2.7701e+9	3.6099e+9	2.9943e+10
		(4.56e+8) −	(5.76e+8) −	(2.14e+8) −	(6.18e+8) −	(6.28e+8) −	(6.39e+7) −	(3.29e+8) −	(5.37e+8) −	(3.35e+8) −	(2.53e+8) −	(1.44e+9)
	10	7.6963e+9	3.3266e+9	1.5863e+10	5.4792e+9	1.1204e+10	8.4671e+9	8.9874e+9	1.8652e+10	7.5664e+9	1.7062e+10	3.1697e+11
		(2.97e+9) −	(3.33e+9) −	(2.67e+9) −	(2.98e+9) −	(4.80e+9) −	(2.83e+8) −	(3.69e+9) −	(4.28e+9) −	(1.77e+9) −	(1.76e+9) −	(1.62e+10)
	15	1.3177e+11	9.4779e+10	8.0931e+11	1.7074e+11	8.5203e+11	4.6733e+11	8.5255e+11	1.8517e+11	7.3702e+11	6.1590e+11	2.3465e+13
		(9.04e+10) −	(1.09e+11) −	(2.41e+11) −	(1.26e+11) −	(4.53e+11) −	(2.32e+10) −	(4.45e+11) −	(1.05e+11) −	(4.91e+11) −	(2.39e+11) −	(1.13e+12)
	3	4.9134e+5	1.6125e+4	4.7633e+5	5.3275e+5	4.6509e+5	4.4291e+5	4.4924e+5	6.0207e+5	4.2274e+5	5.2671e+5	7.7271e+5
		(3.44e+4) −	(1.38e+4) −	(1.93e+4) −	(3.04e+4) −	(1.92e+4) −	(1.00e+4) −	(1.13e+4) −	(1.44e+4) −	(9.38e+3) −	(1.31e+4) −	(2.96e+4)
WFG7	5	4.4220e+7	2.5469e+5	3.6748e+7	6.1314e+7	2.8727e+7	2.6509e+7	2.8105e+7	9.2094e+7	2.5121e+7	4.3911e+7	2.3260e+8
		(5.87e+6) −	(2.67e+5) −	(2.98e+6) −	(6.73e+6) −	(2.94e+6) −	(2.19e+6) −	(1.65e+6) −	(4.29e+6) −	(1.90e+6) −	(2.60e+6) −	(1.15e+7)
	8	2.2936e+9	1.5067e+7	4.8542e+9	2.0975e+9	7.8133e+9	2.8619e+9	3.4824e+9	9.8847e+9	3.6358e+9	6.1198e+9	4.0000e+10
		(6.07e+8) −	(9.58e+6) −	(3.93e+8) −	(5.02e+8) −	(6.53e+8) −	(2.76e+8) −	(1.16e+9) −	(8.24e+8) −	(4.58e+8) −	(4.37e+8) −	(1.29e+9)
	10	1.1179e+10	1.3173e+8	2.3745e+10	9.6811e+9	1.9071e+10	1.6627e+10	1.8520e+10	3.2889e+10	9.0081e+9	2.3655e+10	4.1718e+11
		(2.96e+9) −	(1.16e+8) −	(4.75e+9) −	(2.09e+9) −	(4.42e+9) −	(2.33e+9) −	(8.50e+9) −	(3.21e+9) −	(3.18e+9) −	(2.71e+9) −	(1.62e+10)
	15	3.5440e+11	1.3393e+9	1.9131e+12	1.4527e+11	1.4781e+12	1.1909e+12	1.5543e+12	3.2090e+11	1.8062e+12	1.2418e+12	3.2545e+13
		(2.20e+11) −	(1.02e+9) −	(4.06e+11) −	(7.73e+10) −	(3.28e+11) −	(1.72e+11) −	(4.32e+11) −	(2.04e+11) −	(7.62e+11) −	(2.82e+11) −	(1.13e+12)
	3	7.0743e+5	5.7196e+3	7.2865e+5	5.4501e+5	7.0103e+5	7.3630e+5	7.2478e+5	7.2585e+5	6.6489e+5	6.6860e+5	8.7549e+5
		(2.64e+4) −	(1.91e+4) −	(2.50e+4) −	(3.50e+4) −	(4.34e+4) −	(3.88e+4) −	(3.40e+4) −	(3.72e+4) −	(3.76e+4) −	(1.44e+4) −	(3.71e+4)
WFG8	5	1.2579e+8	3.7052e+6	8.9173e+7	1.1301e+8	9.2699e+7	1.2711e+8	1.1917e+8	1.2986e+8	1.2050e+8	8.7677e+7	2.6015e+8
		(6.21e+6) −	(5.52e+6) −	(4.54e+6) −	(9.76e+6) −	(4.23e+6) −	(1.15e+7) −	(9.85e+6) −	(6.43e+6) −	(7.43e+6) −	(4.27e+6) −	(1.17e+7)
	8	8.7797e+9	2.5293e+7	7.8170e+9	8.0983e+9	9.8716e+9	1.0255e+10	1.4416e+10	1.4445e+10	9.0401e+9	5.5324e+9	3.8098e+10
		(1.46e+9) −	(2.79e+7) −	(1.15e+9) −	(1.20e+9) −	(8.96e+8) −	(1.65e+9) −	(3.10e+9) −	(7.70e+8) −	(1.90e+9) −	(1.02e+9) −	(1.48e+9)
	10	5.7583e+10	3.3060e+8	3.0739e+10	5.2825e+10	3.6410e+10	5.0727e+10	7.7876e+10	4.2373e+10	7.4748e+10	2.6790e+10	3.7749e+11
		(1.40e+10) −	(2.14e+8) −	(6.08e+9) −	(1.24e+10) −	(5.32e+9) −	(9.64e+9) −	(3.17e+10) −	(8.58e+9) −	(3.45e+10) −	(1.05e+10) −	(1.35e+10)
	15	1.6365e+12	1.1336e+10	2.5749e+12	1.6580e+12	1.3738e+12	3.0520e+12	3.8242e+12	1.3352e+12	3.6080e+12	1.7355e+12	2.4527e+13
		(6.99e+11) −	(9.31e+9) −	(1.39e+12) −	(9.63e+11) −	(1.98e+11) −	(6.62e+11) −	(7.90e+11) −	(1.87e+11) −	(6.18e+11) −	(1.26e+12) −	(1.21e+12)
	3	5.0894e+5	7.8169e+4	6.7613e+5	5.6785e+5	6.2434e+5	6.3346e+5	6.3753e+5	6.5694e+5	5.2494e+5	6.0072e+5	8.8183e+5
		(3.00e+4) −	(2.98e+4) −	(2.98e+4) −	(5.70e+4) −	(2.49e+4) −	(2.21e+4) −	(2.11e+4) −	(3.15e+4) −	(3.57e+4) −	(2.24e+4) −	(3.31e+4)
WFG9	5	9.4156e+7	6.0674e+6	8.9955e+7	9.3848e+7	8.9718e+7	8.7560e+7	9.0766e+7	1.2824e+8	5.9624e+7	7.8748e+7	2.8768e+8
		(1.31e+7) −	(7.32e+6) −	(4.96e+6) −	(8.00e+6) −	(7.46e+6) −	(5.65e+6) −	(6.45e+6) −	(7.34e+6) −	(8.82e+6) −	(5.01e+6) −	(8.83e+6)
	8	1.1078e+10	5.0629e+8	6.5799e+9	8.4259e+9	7.2274e+9	6.9759e+9	7.4604e+9	1.5670e+10	1.0296e+10	6.2221e+9	4.6774e+10
		(2.26e+9) −	(1.08e+9) −	(5.88e+8) −	(1.29e+9) −	(7.66e+8) −	(4.81e+8) −	(1.24e+9) −	(7.63e+8) −	(1.23e+9) −	(5.85e+8) −	(1.43e+9)
	10	1.1062e+11	6.9667e+9	4.4437e+10	6.7109e+10	5.2030e+10	4.8109e+10	5.7330e+10	9.0538e+10	6.2592e+10	3.6142e+10	4.8465e+11
		(1.87e+10) −	(1.24e+10) −	(4.43e+9) −	(8.17e+9) −	(4.80e+9) −	(5.57e+9) −	(1.65e+10) −	(9.66e+9) −	(1.53e+10) −	(4.04e+9) −	(2.00e+10)
	15	5.5409e+12	2.2559e+11	2.8328e+12	4.9768e+12	2.1155e+12	2.4355e+12	3.2638e+12	1.9991e+12	3.5309e+12	1.9082e+12	3.5664e+13
		(1.08e+12) −	(4.40e+11) −	(8.87e+11) −	(1.45e+12) −	(2.98e+11) −	(4.41e+11) −	(5.85e+11) −	(4.63e+11) −	(1.08e+12) −	(3.73e+11) −	(1.39e+12)
$+/-/\approx$		0/45/0	0/45/0	0/44/1	9/35/1	0/45/0	0/45/0	0/45/0	3/41/1	0/45/0	0/45/0	

TABLE XII: Mean and standard deviation of the PD values obtained by MaOEAIH and other MaOEAs for MAF and IDTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	1.4787e+5	3.2188e+4	1.0268e+5	1.6455e+5	5.4083e+4	1.6158e+4	7.9800e+4	7.6785e+4	1.5555e+4	2.5795e+4	1.7944e+5
		(8.29e+3) −	(2.62e+3) −	(1.31e+4) −	(8.78e+3) −	(4.51e+3) −	(7.76e+3) −	(1.17e+4) −	(5.99e+3) −	(7.05e+3) −	(1.67e+4) −	(1.30e+4)
MaF1	5	1.0944e+7	2.3725e+6	8.5038e+6	2.5767e+7	2.7539e+6	7.0826e+5	1.6001e+7	5.4458e+6	6.4746e+6	2.9389e+6	1.1942e+7
		(9.14e+5) −	(6.20e+5) −	(2.78e+6) −	(1.73e+6) +	(4.78e+5) −	(9.34e+5) −	(1.64e+6) +	(8.46e+5) −	(1.53e+6) −	(1.95e+6) −	(8.45e+5)
	8	4.8154e+8	1.4017e+8	6.2605e+7	1.9042e+9	4.7729e+8	7.1775e+8	8.8799e+8	5.5842e+8	2.0347e+9	1.2038e+8	3.7002e+8
		(6.12e+7) +	(3.37e+7) −	(3.49e+7) −	(1.93e+8) +	(1.37e+8) +	(1.05e+8) +	(2.47e+8) +	(1.31e+8) +	(5.28e+8) +	(9.31e+7) −	(8.24e+7)
	10	2.2899e+9	8.3264e+8	5.9641e+8	1.3578e+10	6.4167e+9	3.1471e+9	8.2912e+9	3.5565e+9	2.3084e+9	4.6385e+8	2.5036e+9
		(4.72e+8) ≈	(3.00e+8) −	(2.98e+7) −	(1.73e+9) +	(9.41e+8) +	(9.03e+8) +	(8.44e+8) +	(1.60e+9) +	(8.43e+8) ≈	(6.29e+8) −	(5.90e+8)
	15	4.4778e+10	8.1127e+9	2.6745e+10	7.1197e+11	8.3500e+10	1.1098e+11	2.0290e+11	1.5953e+11	1.1215e+11	9.6096e+9	8.0225e+10
		(1.52e+10) −	(3.77e+9) −	(1.55e+10) −	(9.49e+10) +	(2.16e+10) ≈	(2.94e+10) +	(3.57e+10) +	(6.21e+10) +	(6.90e+10) ≈	(9.84e+9) −	(1.43e+10)
	3	1.1015e+5	1.4918e+4	1.2770e+5	1.1454e+5	9.8157e+4	9.8900e+4	1.0644e+5	1.2364e+5	9.4156e+4	1.1875e+5	1.4850e+5
		(4.09e+3) −	(1.33e+4) −	(6.25e+3) −	(6.93e+3) −	(4.82e+3) −	(5.01e+3) −	(7.20e+3) −	(8.12e+3) −	(8.64e+3) −	(8.77e+3) −	(4.02e+3)
MaF2	5	1.5074e+7	6.1324e+6	2.4178e+7	1.3719e+7	1.7579e+7	1.4810e+7	1.8637e+7	2.1436e+7	1.5118e+7	1.5205e+7	2.9328e+7
		(1.11e+6) −	(2.50e+6) −	(1.02e+6) −	(1.52e+6) −	(7.73e+5) −	(1.18e+6) −	(1.27e+6) −	(9.43e+5) −	(1.42e+6) −	(5.63e+5) −	(9.47e+5)
	8	1.0553e+9	7.0797e+8	1.7333e+9	4.3532e+8	1.2146e+9	9.5857e+8	1.3230e+9	1.1472e+9	9.7261e+8	5.0521e+8	3.3430e+9
		(1.06e+8) −	(6.78e+7) −	(1.10e+8) −	(1.33e+8) −	(6.99e+7) −	(1.30e+8) −	(1.55e+8) −	(6.98e+7) −	(1.42e+8) −	(2.68e+8) −	(9.50e+7)
	10	8.7683e+9	6.0093e+9	1.4640e+10	2.1445e+9	8.0108e+9	6.4954e+9	8.6358e+9	6.8086e+9	8.3479e+9	2.5385e+9	2.7803e+10
		(1.17e+9) −	(5.15e+8) −	(1.21e+9) −	(7.18e+8) −	(6.33e+8) −	(8.16e+8) −	(1.10e+9) −	(3.86e+8) −	(1.01e+9) −	(2.49e+9) −	(5.83e+8)
	15	1.1404e+11	1.4553e+11	1.8833e+11	4.8903e+10	1.0080e+11	1.0295e+11	2.4187e+11	1.1057e+11	4.4948e+10	2.8320e+9	1.2222e+12
		(1.19e+10) −	(1.57e+10) −	(4.43e+10) −	(1.54e+11) −	(5.93e+9) −	(3.69e+10) −	(3.51e+10) −	(1.63e+10) −	(1.36e+10) −	(1.87e+9) −	(3.33e+10)
	3	6.3847e+4	1.7976e+7	5.7447e+4	6.1129e+4	7.7370e+4	7.7480e+4	5.7617e+4	3.0323e+8	5.5725e+4	7.5693e+4	9.7833e+4
		(4.07e+3) −	(3.96e+7) +	(3.94e+3) −	(1.23e+4) −	(2.96e+3) −	(2.86e+3) −	(3.86e+3) −	(1.37e+9) +	(3.90e+3) −	(2.29e+3) −	(1.36e+4)
MaF3	5	2.7837e+5	1.8671e+6	1.6680e+6	1.2549e+11	6.2857e+6	4.4894e+6	1.6083e+6	1.0779e+12	1.3329e+6	6.2645e+11	1.4939e+6
		(8.35e+4) −	(5.98e+6) +	(2.36e+5) +	(4.76e+11) +	(4.60e+5) +	(2.85e+5) +	(1.85e+5) ≈	(5.17e+12) +	(8.82e+4) ≈	(3.43e+12) +	(3.63e+5)
	8	7.8149e+5	1.5694e+6	5.8336e+7	1.1670e+18	1.4248e+7	2.5901e+11	2.8865e+13	4.4452e+17	1.8947e+17	1.6299e+8	6.6817e+6
		(1.53e+5) −	(4.57e+6) −	(1.12e+7) +	(6.51e+17) +	(2.88e+6) +	(7.78e+11) +	(1.58e+14) +	(3.48e+17) +	(9.50e+17) +	(2.62e+7) +	(3.54e+6)
	10	3.9491e+7	2.0852e+6	2.7395e+8	2.8675e+19	9.2750e+6	2.9538e+14	2.6551e+14	6.8310e+18	3.8918e+18	8.4906e+8	1.3579e+7
		(5.78e+7) ≈	(5.60e+6) −	(1.07e+8) +	(1.51e+19) +	(8.49e+6) −	(1.27e+15) +	(1.45e+15) +	(5.04e+18) +	(6.11e+18) +	(1.29e+8) +	(5.25e+6)
	15	7.8327e+9	2.7128e+8	7.3006e+9	2.3299e+21	3.2579e+7	1.1124e+16	9.4641e+16	2.0327e+18	1.5759e+18	8.1622e+9	6.8372e+7
		(5.10e+9) +	(8.81e+8) +	(2.20e+9) +	(1.07e+21) +	(2.99e+7) −	(4.15e+16) +	(2.10e+17) +	(2.06e+18) +	(3.01e+18) +	(1.30e+9) +	(5.81e+7)
	3	7.1526e+5	1.2956e+6	4.9457e+5	5.2747e+5	5.1612e+5	5.7299e+5	1.1705e+6	6.8375e+5	1.0953e+7	5.2355e+6	9.1218e+5
		(4.09e+4) −	(8.90e+5) +	(6.09e+4) −	(5.97e+4) −	(3.51e+4) −	(5.58e+4) −	(1.65e+6) +	(8.05e+5) −	(1.14e+7) +	(1.03e+7) +	(4.24e+4)
MaF4	5	3.0426e+8	2.0791e+8	2.1339e+8	2.5067e+8	1.5198e+8	1.1011e+8	4.7199e+8	1.2146e+9	1.8137e+10	3.4368e+9	3.3433e+8
		(1.75e+7) −	(1.30e+8) −	(5.36e+7) −	(2.30e+7) −	(1.64e+7) −	(1.88e+7) −	(8.46e+8) +	(1.80e+9) ≈	(8.86e+9) +	(2.75e+9) +	(2.77e+7)
	8	8.7358e+10	9.7297e+10	2.2087e+10	8.0170e+10	2.0070e+10	1.9282e+10	1.6691e+10	1.6684e+10	1.3678e+13	1.0032e+12	9.8503e+10
		(6.73e+9) −	(7.47e+10) ≈	(3.90e+9) −	(1.00e+10) −	(2.20e+9) −	(3.92e+9) −	(4.44e+9) −	(1.53e+9) −	(4.76e+12) +	(1.16e+12) +	(8.87e+9)
	10	1.4842e+12	2.4330e+12	2.2215e+11	1.5495e+12	1.4522e+11	1.7140e+11	2.9954e+11	2.7013e+11	1.8774e+14	3.8685e+12	1.5112e+12
		(9.63e+10) ≈	(1.70e+12) ≈	(4.50e+10) −	(2.86e+11) ≈	(2.18e+10) −	(4.85e+10) −	(5.35e+10) −	(2.16e+10) −	(7.77e+13) +	(1.15e+13) +	(1.77e+11)
	15	3.6931e+14	6.0075e+14	8.2181e+12	5.2082e+14	4.5521e+13	3.3358e+13	1.6052e+13	3.2508e+13	1.0462e+17	2.5627e+15	3.1453e+14
		(4.15e+13) +	(4.52e+14) +	(2.84e+12) −	(1.29e+14) +	(1.47e+13) −	(8.94e+12) −	(6.33e+12) −	(6.89e+12) −	(4.44e+16) +	(7.83e+15) ≈	(3.68e+13)
	3	2.5145e+5	1.4611e+4	2.0474e+5	4.0270e+5	2.3863e+5	4.2563e+5	3.8851e+5	5.5613e+5	4.0646e+5	3.8375e+5	7.9161e+5
		(2.52e+5) −	(1.27e+4) −	(2.19e+5) −	(8.17e+4) −	(1.95e+5) −	(1.49e+5) −	(1.40e+5) −	(2.02e+4) −	(1.29e+4) −	(7.11e+4) −	(4.18e+4)
MaF5	5	2.0835e+7	4.5302e+6	2.7754e+7	1.8296e+7	1.1898e+7	2.8080e+7	2.6464e+7	5.8489e+7	2.5608e+7	2.5251e+7	1.2174e+8
		(1.05e+7) −	(3.65e+6) −	(6.71e+6) −	(6.20e+6) −	(7.13e+6) −	(4.96e+6) −	(6.69e+6) −	(3.04e+6) −	(1.83e+6) −	(8.65e+6) −	(1.37e+7)
	8	3.8030e+8	6.5118e+7	6.8915e+9	3.3810e+7	1.0924e+10	5.2862e+9	5.4270e+9	2.0442e+10	9.9683e+9	4.1964e+9	2.8356e+9
		(2.03e+8) −	(1.06e+8) −	(1.36e+9) +	(2.15e+7) −	(4.78e+9) +	(3.50e+8) +	(2.33e+8) +	(1.60e+9) +	(1.24e+9) +	(2.37e+9) +	(9.34e+8)
	10	7.9206e+8	1.0718e+7	3.5830e+9	5.6368e+7	3.1625e+10	5.0681e+10	5.3613e+10	1.2152e+10	3.3612e+10	2.1551e+10	9.2967e+9
		(6.40e+8) −	(1.21e+7) −	(3.76e+9) −	(3.46e+7) −	(2.30e+10) +	(1.51e+9) +	(3.22e+9) +	(6.86e+9) ≈	(1.36e+10) +	(2.06e+10) +	(3.90e+9)
	15	1.4276e+10	4.1965e+7	3.1690e+11	2.5803e+8	4.9229e+12	1.3370e+13	1.3503e+13	2.6014e+11	1.4608e+13	5.2462e+11	3.5109e+11
		(1.39e+10) −	(8.37e+7) −	(9.63e+11) −	(2.41e+8) −	(6.58e+12) +	(1.92e+11) +	(2.44e+11) +	(7.52e+11) −	(4.61e+12) +	(1.37e+12) +	(1.43e+11)
	3	5.7857e+4	2.4100e+3	7.0996e+4	6.6970e+4	6.3517e+4	5.9142e+4	6.5802e+4	5.1483e+4	3.0895e+6	1.4553e+7	6.3283e+4
		(3.45e+3) −	(8.22e+3) −	(8.37e+3) +	(6.99e+3) +	(7.67e+3) ≈	(6.02e+3) −	(8.00e+3) ≈	(5.81e+3) −	(1.58e+6) +	(1.27e+6) +	(4.03e+3)
MaF6	5	6.7904e+6	3.3882e+5	8.6326e+6	8.1957e+6	6.6789e+6	5.3159e+6	6.6089e+6	6.1643e+6	1.5382e+9	1.9969e+7	7.4607e+6
		(4.47e+5) −	(9.22e+5) −	(9.39e+5) +	(1.11e+6) +	(1.17e+6) −	(3.87e+5) −	(9.90e+5) −	(9.43e+5) −	(7.13e+8) +	(3.59e+7) ≈	(1.01e+6)
	8	7.0752e+8	1.0530e+7	5.5456e+8	1.2271e+10	7.8891e+8	6.3222e+8	3.4703e+9	3.5245e+8	9.9537e+10	9.4800e+9	9.4488e+8
		(1.03e+9) ≈	(6.80e+6) −	(1.02e+8) −	(1.56e+10) +	(9.14e+8) −	(1.59e+9) −	(4.16e+9) ≈	(3.32e+7) −	(2.18e+10) +	(1.58e+10) +	(1.47e+9)
	10	1.0841e+10	6.1097e+7	3.7762e+9	5.5195e+11	3.2428e+10	5.8274e+10	1.5189e+11	6.6204e+10	1.6718e+12	5.6347e+9	3.6469e+10
		(7.98e+9) −	(3.91e+7) −	(3.68e+8) −	(2.25e+11) +	(2.33e+10) ≈	(5.53e+10) ≈	(7.75e+10) +	(1.21e+11) ≈	(2.84e+11) +	(1.20e+10) −	(4.37e+10)
	15	2.0371e+11	9.6593e+8	9.3566e+10	6.2634e+13	1.2882e+12	5.5178e+11	3.1133e+12	2.9088e+12	3.9557e+13	1.7713e+10	2.2517e+12
		(6.06e+10) −	(7.11e+8) −	(1.04e+10) −	(2.16e+13) +	(7.34e+11) −	(5.12e+11) −	(1.21e+12) +	(1.21e+12) +	(1.04e+13) +	(2.18e+10) −	(1.42e+12)
	3	1.1889e+5	1.7133e+4	1.2728e+5	1.2870e+5	1.1940e+5	9.4409e+4	1.2112e+5	1.3253e+5	9.4906e+4	1.7446e+5	1.4870e+5
		(2.02e+4) −	(1.87e+4) −	(3.36e+4) −	(2.15e+4) −	(3.23e+4) −	(2.87e+4) −	(1.71e+4) −	(1.98e+4) −	(1.69e+4) −	(7.53e+3) +	(1.46e+4)
MaF7	5	9.0567e+6	1.1753e+6	2.5594e+7	1.7404e+7	2.3601e+7	7.0385e+6	1.9700e+7	3.3065e+7	3.8311e+6	1.2707e+7	2.4088e+7
		(2.20e+6) −	(1.36e+6) −	(3.52e+6) ≈	(2.47e+6) −	(1.05e+7) ≈	(2.22e+6) −	(2.90e+6) −	(2.60e+6) +	(1.76e+6) −	(4.54e+5) −	(2.78e+6)
	8	4.7982e+8	6.2912e+7	1.2086e+9	6.1299e+8	1.5108e+9	7.8601e+8	1.0415e+9	1.5872e+9	4.8152e+8	1.4506e+9	2.8765e+9
		(1.67e+8) −	(1.17e+8) −	(1.93e+8) −	(1.58e+8) −	(2.78e+8) −	(1.86e+8) −	(1.65e+8) −	(1.84e+8) −	(1.39e+8) −	(1.49e+8) −	(3.22e+8)
	10	3.5733e+9	1.6355e+9	8.3675e+9	9.3597e+9	8.9527e+9	7.1216e+9	5.8414e+9	7.7640e+9	5.4627e+9	1.0327e+10	2.2099e+10
		(2.59e+9) −	(1.95e+9) −	(2.26e+9) −	(1.63e+9) −	(6.96e+8) −	(1.96e+9) −	(1.33e+9) −	(1.10e+9) −	(1.59e+9) −	(7.62e+8) −	(2.05e+9)
	15	2.2788e+11	1.8501e+11	6.1079e+11	3.2417e+11	2.5543e+10	1.1566e+10	6.3345e+10	9.3224e+10	4.6397e+10	5.7590e+11	1.2613e+12
		(7.53e+10) −	(5.35e+10) −	(6.13e+10) −	(8.14e+10) −	(2.67e+10) −	(6.14e+9) −	(1.89e+10) −	(1.74e+10) −	(1.36e+10) −	(3.38e+10) −	(2.09e+11)
	3	2.8886e+5	2.0560e+4	3.0354e+5	1.2889e+5	2.2219e+5	1.4008e+5	2.3777e+5	2.3226e+5	1.5019e+6	2.0875e+5	3.3705e+5
		(1.67e+4) −	(1.63e+4) −	(1.86e+4) −	(2.84e+4) −	(6.38e+4) −	(3.33e+4) −	(1.92e+4) −	(1.66e+4) −	(6.87e+6) +	(1.87e+4) −	(1.61e+4)
MaF8	5	6.4704e+7	4.1059e+6	5.6493e+7	4.1906e+7	5.3502e+7	1.4055e+7	3.1830e+7	5.1705e+7	2.7684e+7	1.9728e+9	7.9231e+7
		(2.14e+6) −	(3.76e+6) −	(3.92e+6) −	(4.01e+6) −	(1.05e+7) −	(2.08e+6) −	(4.62e+6) −	(3.72e+6) −	(2.03e+6) −	(2.40e+9) +	(2.90e+6)
	8	8.2778e+9	1.3557e+8	7.1851e+9	6.0090e+9	6.1037e+9	1.5986e+9	3.3566e+9	6.2691e+9	1.0742e+11	7.9094e+11	9.4366e+9
		(2.27e+8) −	(2.53e+8) −	(4.27e+8) −	(3.86e+8) −	(1.85e+8) −	(3.72e+8) −	(4.06e+8) −	(3.08e+8) −	(1.32e+11) ≈	(1.36e+12) +	(3.49e+8)
	10	8.1452e+10	6.2444e+8	6.3749e+10	6.1531e+10	5.3078e+10	1.1296e+10	3.3421e+10	4.8810e+10	3.2874e+12	1.5008e+12	9.0496e+10
		(2.58e+9) −	(7.18e+8) −	(2.34e+9) −	(3.99e+9) −	(2.89e+9) −	(4.50e+9) −	(4.76e+9) −	(3.32e+9) −	(6.68e+12) ≈	(1.85e+12) +	(2.87e+9)
	15	4.8678e+12	3.7349e+9	2.4083e+12	3.8502e+12	2.5279e+12	5.5193e+11	1.4289e+12	2.2223e+12	4.0137e+14	2.2151e+14	5.4395e+12
		(9.92e+10) −	(1.30e+10) −	(1.82e+11) −	(2.12e+11) −	(1.74e+11) −	(2.03e+11) −	(2.97e+11) −	(1.88e+11) −	(4.86e+14) +	(2.05e+14) +	(1.82e+11)
	3	1.5359e+5	2.4592e+4	6.3850e+4	1.0713e+6	7.2956e+4	5.6570e+4	5.5479e+4	5.7272e+6	1.1334e+7	6.4084e+4	3.0302e+5
		(1.36e+4) −	(2.82e+4) −	(1.07e+4) −	(1.97e+6) ≈	(1.24e+4) −	(8.91e+3) −	(1.08e+4) −	(4.27e+6) +	(2.02e+7) ≈	(8.15e+3) −	(1.13e+4)
MaF9	5	5.5205e+7	7.3012e+6	2.9649e+8	8.1776e+8	5.3903e+7	2.0456e+9	1.3804e+9	1.0404e+9	3.4922e+10	8.5169e+8	8.3619e+7
		(2.91e+6) −	(6.66e+6) −	(6.72e+8) +	(1.32e+9) ≈	(3.11e+6) −	(2.64e+9) +	(1.58e+9) +	(1.11e+9) +	(1.94e+10) +	(1.24e+9) +	(3.88e+6)
	8	7.5166e+9	4.4917e+8	7.8780e+10	3.2070e+12	4.4069e+9	5.5755e+11	7.4813e+11	1.1146e+12	8.0062e+12	1.3160e+11	8.1503e+10
		(4.08e+8) −	(4.18e+8) −	(3.51e+11) −	(7.32e+11) +	(6.92e+8) −	(2.38e+11) +	(3.25e+11) +	(5.94e+11) +	(2.85e+12) +	(2.54e+11) +	(8.78e+9)
	10	8.2091e+10	2.5021e+9	9.9892e+10	5.8391e+13	5.3206e+10	1.8378e+13	3.0140e+13	2.7777e+13	6.7718e+13	2.7942e+11	1.1282e+12
		(5.40e+9) −	(3.13e+9) −	(2.47e+10) −	(2.30e+13) +	(4.72e+9) −	(5.13e+12) +	(6.53e+12) +	(7.96e+12) +	(1.77e+13) +	(5.02e+11) −	(1.22e+11)
	15	4.9893e+12	1.4468e+11	5.6997e+13	2.9874e+14	4.3472e+12	8.5456e+14	8.2277e+14	1.0277e+15	4.5981e+15	1.1551e+14	1.1642e+13
		(2.19e+11) −	(5.02e+11) −	(1.37e+14) ≈	(4.11e+14) +	(2.37e+12) −	(6.43e+14) +	(7.61e+14) +	(7.18e+14) +	(1.57e+15) +	(2.19e+14) +	(1.31e+13)

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Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	2.3142e+5	2.0681e+4	3.0281e+5	2.7111e+5	3.1622e+5	3.4802e+5	2.6142e+5	2.6708e+5	2.5342e+5	3.1534e+5	3.5877e+5
		(2.42e+4) −	(2.14e+4) −	(4.26e+4) −	(2.74e+4) −	(1.77e+4) −	(1.17e+4) −	(9.71e+3) −	(2.55e+4) −	(1.27e+4) −	(1.17e+4) −	(2.08e+4)
MaF10	5	4.0611e+6	1.7495e+6	1.5548e+7	3.4583e+7	2.3028e+7	3.7240e+7	1.2389e+7	4.3542e+7	1.0021e+7	3.5626e+7	4.6150e+7
		(2.00e+6) −	(2.36e+6) −	(1.78e+6) −	(3.87e+6) −	(2.72e+6) −	(1.73e+6) −	(1.84e+6) −	(3.99e+6) −	(9.86e+5) −	(2.16e+6) −	(9.70e+6)
	8	2.9022e+8	1.9019e+8	9.4274e+8	2.9480e+9	5.1939e+7	1.0510e+9	7.3747e+8	3.2249e+9	7.9537e+8	1.4102e+9	2.8077e+9
		(1.97e+8) −	(2.38e+8) −	(1.09e+8) −	(3.56e+8) ≈	(3.51e+7) −	(1.24e+8) −	(9.00e+7) −	(4.31e+8) +	(3.03e+8) −	(2.54e+8) −	(2.84e+8)
	10	2.3622e+9	6.3580e+8	3.6362e+9	2.4531e+10	2.2123e+9	7.0328e+9	5.8728e+9	1.1084e+10	3.6747e+9	8.5577e+9	1.8504e+10
		(2.14e+9) −	(1.52e+9) −	(7.78e+8) −	(4.52e+9) +	(3.48e+9) −	(1.52e+9) −	(2.62e+9) −	(2.53e+9) −	(2.60e+9) −	(1.23e+9) −	(2.35e+9)
	15	9.7939e+10	3.6592e+10	1.2323e+11	1.6383e+12	8.4602e+8	1.3910e+11	1.7108e+11	9.9862e+10	9.8569e+10	1.3111e+11	4.9579e+11
		(1.23e+11) −	(8.18e+10) −	(1.49e+10) −	(4.82e+11) +	(3.88e+9) −	(6.12e+10) −	(9.01e+10) −	(1.57e+11) −	(5.27e+10) −	(2.17e+10) −	(1.84e+11)
	3	2.1974e+5	6.4887e+4	3.1400e+5	3.1390e+5	3.9046e+5	3.7938e+5	3.0835e+5	4.2093e+5	2.3133e+5	3.7801e+5	4.5336e+5
		(2.15e+4) −	(1.65e+4) −	(3.06e+4) −	(1.74e+4) −	(1.65e+4) −	(1.34e+4) −	(1.93e+4) −	(2.36e+4) −	(2.31e+4) −	(1.23e+4) −	(2.60e+4)
MaF11	5	7.2621e+6	2.7253e+6	1.6456e+7	6.2806e+7	4.7995e+7	3.2140e+7	1.5203e+7	6.4491e+7	1.1247e+7	3.9367e+7	5.6469e+7
		(2.06e+6) −	(1.53e+6) −	(1.84e+6) −	(4.60e+6) +	(3.14e+6) −	(1.46e+6) −	(9.84e+5) −	(4.45e+6) +	(2.16e+6) −	(2.35e+6) −	(5.37e+6)
	8	2.1739e+8	1.8610e+8	6.7243e+8	5.9770e+9	3.6709e+8	1.3269e+9	1.2250e+9	4.5562e+9	6.0802e+8	1.9688e+9	3.9949e+9
		(1.01e+8) −	(7.97e+7) −	(4.90e+7) −	(5.34e+8) +	(3.59e+8) −	(4.11e+8) −	(9.52e+8) −	(3.86e+8) +	(5.01e+7) −	(1.13e+8) −	(3.05e+8)
	10	8.8235e+8	1.1935e+9	3.6448e+9	4.6021e+10	1.5340e+8	1.0417e+10	1.0162e+10	1.9250e+10	4.4038e+9	1.0275e+10	2.7609e+10
		(8.75e+8) −	(5.20e+8) −	(2.72e+8) −	(3.49e+9) +	(1.30e+8) −	(2.11e+9) −	(6.43e+9) −	(1.95e+9) −	(2.09e+9) −	(5.15e+8) −	(2.10e+9)
	15	5.1767e+11	2.1419e+10	1.3584e+11	1.7861e+12	4.6138e+8	1.0840e+11	2.0725e+11	1.2791e+11	1.2375e+11	1.4143e+11	9.3537e+11
		(2.85e+11) −	(1.96e+10) −	(3.12e+10) −	(3.73e+11) +	(8.95e+8) −	(4.12e+10) −	(5.75e+10) −	(8.42e+10) −	(5.26e+10) −	(8.36e+9) −	(9.09e+10)
	3	5.1679e+5	6.6264e+4	6.8120e+5	5.8341e+5	6.2934e+5	6.4423e+5	6.3801e+5	6.6002e+5	5.3922e+5	6.1095e+5	8.8639e+5
		(2.73e+4) −	(3.24e+4) −	(3.25e+4) −	(6.51e+4) −	(3.10e+4) −	(2.10e+4) −	(2.27e+4) −	(3.82e+4) −	(4.50e+4) −	(2.19e+4) −	(4.15e+4)
MaF12	5	9.0889e+7	5.5683e+6	9.0532e+7	9.0084e+7	8.7874e+7	8.9357e+7	9.0488e+7	1.3257e+8	6.1007e+7	8.0158e+7	2.8797e+8
		(1.24e+7) −	(5.56e+6) −	(5.54e+6) −	(8.25e+6) −	(6.95e+6) −	(1.12e+7) −	(4.94e+6) −	(6.87e+6) −	(8.54e+6) −	(7.90e+6) −	(1.01e+7)
	8	1.0562e+10	9.1265e+8	6.6696e+9	9.0678e+9	7.2076e+9	7.1208e+9	7.6662e+9	1.5882e+10	1.0346e+10	6.3897e+9	4.6543e+10
		(1.32e+9) −	(1.55e+9) −	(5.07e+8) −	(1.15e+9) −	(4.50e+8) −	(5.76e+8) −	(1.96e+9) −	(9.44e+8) −	(1.58e+9) −	(3.84e+8) −	(1.46e+9)
	10	1.1792e+11	1.0985e+9	4.7184e+10	7.0578e+10	5.3744e+10	4.8170e+10	5.4957e+10	8.6616e+10	5.9497e+10	3.5985e+10	4.8702e+11
		(2.50e+10) −	(1.12e+9) −	(5.31e+9) −	(1.29e+10) −	(5.88e+9) −	(4.61e+9) −	(1.73e+10) −	(8.01e+9) −	(1.64e+10) −	(3.89e+9) −	(2.14e+10)
	15	5.9557e+12	2.5208e+11	2.7831e+12	4.8793e+12	2.2151e+12	2.4536e+12	3.1020e+12	2.0271e+12	3.1916e+12	1.8220e+12	3.5364e+13
		(8.77e+11) −	(4.26e+11) −	(1.48e+12) −	(1.88e+12) −	(2.87e+11) −	(4.58e+11) −	(8.05e+11) −	(4.14e+11) −	(1.05e+12) −	(2.84e+11) −	(1.12e+12)
	3	1.0513e+5	1.2765e+4	1.3611e+5	8.8953e+4	1.1596e+5	1.4698e+5	1.4204e+5	1.0457e+5	1.3247e+5	1.4050e+5	1.4900e+5
		(5.98e+3) −	(1.29e+4) −	(1.22e+4) −	(1.79e+4) −	(5.02e+3) −	(1.41e+4) ≈	(1.21e+4) −	(1.68e+4) −	(6.55e+3) −	(6.15e+3) −	(1.64e+4)
MaF13	5	1.6903e+7	4.4524e+5	1.5354e+8	2.6489e+11	1.3326e+7	4.0643e+12	3.8414e+12	4.7494e+16	3.6013e+18	4.5630e+9	2.6819e+7
		(1.21e+6) −	(6.57e+5) −	(6.82e+8) +	(7.46e+11) +	(2.71e+6) −	(3.42e+12) +	(4.67e+12) +	(1.97e+17) +	(5.90e+17) +	(4.20e+9) +	(2.08e+6)
	8	2.0152e+9	1.7946e+7	1.0848e+15	1.0071e+16	9.1865e+8	2.9863e+16	2.2277e+16	4.1832e+20	1.9408e+22	5.9953e+13	2.4932e+9
		(1.53e+8) −	(1.34e+7) −	(5.94e+15) +	(1.46e+16) +	(1.45e+8) −	(2.28e+16) +	(2.78e+16) +	(2.00e+21) +	(5.02e+21) +	(2.96e+14) +	(2.18e+8)
	10	1.8875e+10	1.0019e+8	8.4627e+11	7.7595e+18	7.8199e+9	6.5686e+17	5.3380e+17	1.7085e+22	4.9345e+23	3.4031e+13	2.1823e+10
		(1.55e+9) −	(8.52e+7) −	(4.34e+12) +	(4.20e+19) +	(1.29e+9) −	(4.08e+17) +	(5.21e+17) +	(6.49e+22) +	(9.25e+22) +	(1.25e+14) ≈	(2.06e+9)
	15	1.0521e+12	1.4740e+9	5.9301e+17	1.6531e+19	4.5428e+11	1.2412e+20	3.9693e+20	4.4128e+24	7.1475e+25	2.0245e+17	1.1425e+12
		(9.08e+10) −	(1.26e+9) −	(3.24e+18) +	(3.34e+19) +	(1.82e+11) −	(8.30e+19) +	(1.69e+21) +	(1.19e+25) +	(2.44e+25) +	(1.11e+18) ≈	(1.05e+11)
	3	5.9187e+4	1.4610e+4	4.9634e+4	5.7556e+4	9.5641e+3	1.6197e+4	9.9329e+4	2.9756e+4	1.4457e+5	2.9604e+5	7.1549e+4
		(4.31e+3) −	(8.19e+3) −	(3.89e+3) −	(3.90e+4) −	(1.57e+3) −	(2.88e+4) −	(1.79e+5) +	(3.87e+4) −	(6.54e+5) +	(7.67e+5) +	(6.45e+3)
IDTLZ1	5	2.5581e+6	1.5913e+6	2.2497e+7	9.6900e+6	3.2672e+5	3.1997e+6	9.1208e+6	6.7790e+7	9.8313e+8	1.1779e+8	5.1045e+6
		(5.95e+5) −	(8.68e+5) −	(6.07e+7) ≈	(1.11e+6) +	(2.10e+5) −	(1.62e+7) −	(3.10e+7) +	(1.48e+8) ≈	(7.20e+8) +	(1.68e+8) +	(8.43e+5)
	8	6.0080e+7	3.3618e+7	3.1442e+7	6.9147e+8	8.1414e+7	1.8769e+8	2.9020e+8	1.9697e+8	2.7407e+11	5.6451e+10	8.4308e+7
		(1.74e+7) ≈	(3.78e+7) −	(1.68e+7) −	(9.20e+7) +	(3.34e+7) ≈	(4.48e+7) +	(7.46e+7) +	(7.75e+7) +	(8.43e+10) +	(4.34e+10) +	(5.17e+7)
	10	2.4441e+8	8.8615e+7	3.6265e+8	5.3196e+9	1.1871e+9	6.5589e+8	3.1239e+9	2.2401e+9	1.9879e+12	1.2748e+11	1.2367e+9
		(1.33e+8) −	(1.72e+8) −	(8.71e+7) −	(1.32e+9) +	(6.99e+8) ≈	(3.64e+8) −	(6.49e+8) +	(7.68e+8) +	(6.39e+11) +	(1.78e+11) +	(4.22e+8)
	15	2.7197e+9	3.4322e+8	4.4925e+9	2.1239e+11	1.4865e+10	3.4983e+10	8.1223e+10	2.4610e+10	1.0897e+14	3.2545e+12	2.5683e+10
		(3.63e+9) −	(8.51e+8) −	(3.49e+9) −	(4.11e+10) +	(1.03e+10) ≈	(1.90e+10) ≈	(2.09e+10) +	(9.51e+9) ≈	(5.01e+13) +	(8.94e+12) +	(1.89e+10)
	3	1.7648e+5	8.1963e+3	1.3311e+5	1.8414e+5	1.5404e+5	1.2830e+5	9.7527e+4	1.3954e+5	1.5007e+5	1.1916e+5	2.3227e+5
		(1.05e+4) −	(3.50e+3) −	(7.14e+3) −	(7.77e+3) −	(6.70e+3) −	(1.13e+4) −	(8.11e+3) −	(5.08e+3) −	(2.08e+4) −	(9.55e+3) −	(9.19e+3)
IDTLZ2	5	3.9323e+7	1.3502e+6	2.9443e+7	4.1526e+7	2.2541e+7	1.9063e+7	2.9141e+7	1.9488e+7	1.4233e+7	5.1746e+6	4.4737e+7
		(1.84e+6) −	(4.17e+5) −	(2.10e+6) −	(2.77e+6) −	(1.49e+6) −	(2.84e+6) −	(2.47e+6) −	(1.35e+6) −	(2.77e+6) −	(9.28e+5) −	(2.68e+6)
	8	3.9370e+9	1.0760e+7	1.6901e+9	4.1559e+9	1.1474e+9	1.2431e+9	2.1075e+9	8.4125e+8	9.1660e+8	3.8013e+8	5.7988e+9
		(2.16e+8) −	(5.73e+6) −	(2.15e+8) −	(4.60e+8) −	(1.08e+8) −	(1.70e+8) −	(2.46e+8) −	(5.84e+7) −	(1.30e+8) −	(7.90e+7) −	(1.70e+8)
	10	3.5979e+10	5.8021e+8	2.5034e+10	3.5102e+10	5.5184e+9	3.7369e+9	1.0053e+10	5.8161e+9	4.9917e+9	2.9762e+9	5.6730e+10
		(1.57e+9) −	(5.59e+8) −	(2.48e+9) −	(2.50e+9) −	(8.79e+8) −	(6.87e+8) −	(1.63e+9) −	(3.50e+8) −	(8.77e+8) −	(1.28e+9) −	(1.45e+9)
	15	1.4375e+12	1.1161e+10	4.4754e+11	1.9256e+12	1.8394e+11	9.6058e+10	7.0467e+10	8.4566e+10	1.2686e+11	4.5699e+10	3.2229e+12
		(8.51e+10) −	(2.06e+9) −	(8.30e+10) −	(2.89e+11) −	(3.01e+10) −	(2.89e+10) −	(2.08e+10) −	(1.42e+10) −	(7.02e+10) −	(1.66e+10) −	(7.86e+10)
$+/-/\approx$		3/67/5	5/68/2	12/60/3	31/40/4	7/61/7	19/53/3	27/45/3	25/45/5	32/37/6	28/43/4	

TABLE XIII: Mean and standard deviation of the Spread values obtained by MaOEAIH and other MaOEAs for DTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	1.8036e-1	1.3259e+1	2.6048e-1	8.9845e-1	1.5188e-4	3.4927e-4	1.8937e-4	6.2041e-1	1.7179e-4	1.0404e-4	1.5270e-1
		(1.10e-2) −	(3.89e+1) −	(4.07e-2) −	(4.68e-1) −	(4.11e-4) +	(6.47e-4) +	(5.21e-4) +	(5.77e-1) −	(6.14e-5) +	(2.53e-5) +	(1.27e-2)
DTLZ1	5	1.4210e-1	4.2798e+0	4.1895e-1	1.2560e+0	3.3676e-2	3.3685e-2	3.3672e-2	1.0162e+0	3.3739e-2	3.3682e-2	1.2298e-1
		(1.40e-2) ≈	(8.35e+0) −	(4.37e-2) −	(5.73e-1) −	(4.72e-5) +	(4.80e-5) +	(5.48e-5) +	(6.60e-1) −	(3.10e-5) +	(9.51e-6) +	(5.14e-2)
	8	1.1616e-1	9.4555e-1	6.8986e-1	9.3916e-1	1.2328e-1	1.2320e-1	1.2326e-1	1.3502e+0	1.2419e-1	1.2310e-1	8.2484e-2
		(1.51e-2) −	(1.28e+0) −	(5.01e-2) −	(2.96e-1) −	(1.10e-4) −	(6.61e-5) −	(5.32e-5) −	(5.99e-1) −	(4.22e-4) −	(2.26e-4) −	(4.78e-3)
	10	1.0004e-1	-4.5599e-1	9.3926e-1	4.6988e-1	1.2099e-4	6.5236e-4	3.9303e-4	1.6646e+0	2.6810e-2	8.2754e-4	1.1833e-1
		(2.19e-2) +	(3.85e+0) +	(8.65e-2) −	(1.85e-1) −	(3.03e-5) +	(8.17e-4) +	(1.03e-4) +	(5.44e-1) −	(1.35e-2) +	(2.10e-4) +	(4.01e-2)
	15	2.9455e-1	8.7852e-1	1.6587e+0	3.5832e-1	3.4514e-2	1.8149e+0	2.9501e+0	2.7476e+0	1.9611e+0	1.0265e-3	2.2757e-1
		(1.04e-1) −	(1.84e+0) −	(8.14e-2) −	(1.41e-1) −	(1.87e-1) +	(1.10e+0) −	(5.82e-1) −	(5.21e-1) −	(1.34e+0) −	(4.79e-4) +	(1.05e-1)
	3	3.3912e-1	5.5977e-1	3.0471e-1	4.5169e-1	2.1369e-1	1.7042e-1	1.7053e-1	1.7231e-1	1.7061e-1	1.7046e-1	1.1980e-1
		(2.51e-2) −	(2.34e-3) −	(1.63e-2) −	(7.15e-2) −	(2.16e-2) −	(5.30e-4) −	(4.84e-4) −	(3.92e-3) −	(1.25e-4) −	(1.63e-5) −	(1.33e-2)
DTLZ2	5	2.6744e-1	2.4563e-1	3.6552e-1	2.9804e-1	1.7496e-1	1.7484e-1	1.7485e-1	1.7138e-1	1.7560e-1	1.7494e-1	9.6571e-2
		(1.91e-2) −	(4.24e-2) −	(2.61e-2) −	(8.33e-2) −	(4.20e-5) −	(3.02e-4) −	(7.29e-4) −	(3.81e-3) −	(1.88e-4) −	(2.15e-5) −	(1.23e-2)
	8	2.1046e-1	3.8636e-1	6.3567e-1	1.8483e-1	9.7218e-2	5.6927e-2	2.1509e-1	1.0398e-1	7.3113e-2	5.6871e-2	1.3549e-1
		(3.78e-2) −	(1.58e-1) −	(9.35e-3) −	(1.40e-1) ≈	(1.16e-2) +	(2.92e-4) +	(2.65e-1) −	(2.66e-2) +	(4.70e-3) +	(1.13e-4) +	(1.53e-2)
	10	2.8512e-1	-9.2365e+1	9.3882e-1	1.5761e-1	4.6198e-1	3.9254e-1	5.4418e-1	4.6335e-1	4.2200e-1	3.9252e-1	1.4747e-1
		(2.12e-2) −	(5.12e+2) +	(3.65e-2) −	(1.28e-1) ≈	(2.05e-2) −	(2.60e-4) −	(2.37e-1) −	(1.92e-2) −	(4.30e-3) −	(1.73e-4) −	(1.35e-2)
	15	9.3544e-2	1.4547e+0	1.6847e+0	1.6018e-1	4.1069e-1	1.6626e-1	1.2610e+0	8.5469e-1	3.3447e-1	4.7032e-2	1.7190e-1
		(3.64e-2) +	(9.28e-1) −	(4.09e-2) −	(1.60e-1) +	(2.27e-1) −	(3.81e-1) +	(2.09e-1) −	(2.09e-1) −	(4.16e-1) ≈	(2.43e-1) +	(1.23e-2)
	3	3.2702e-1	1.4132e+0	3.1000e-1	1.0578e+0	2.1426e-1	1.7047e-1	1.7048e-1	7.3310e-1	1.7076e-1	1.7047e-1	1.0648e-1
		(3.27e-2) −	(3.34e-1) −	(2.52e-2) −	(5.44e-1) −	(1.79e-2) −	(6.77e-5) −	(4.47e-5) −	(6.49e-1) −	(1.86e-4) −	(2.47e-5) −	(1.58e-2)
DTLZ3	5	2.7095e-1	1.1794e+0	3.7925e-1	1.3594e+0	1.7496e-1	1.7490e-1	1.7496e-1	1.7815e+0	1.7601e-1	1.7495e-1	1.7411e-1
		(2.11e-2) −	(1.96e-1) −	(1.66e-2) −	(5.85e-1) −	(8.74e-5) −	(2.53e-4) −	(1.28e-4) −	(2.89e-1) −	(2.24e-4) −	(4.21e-5) −	(1.59e-1)
	8	2.2052e-1	1.1574e+0	6.6644e-1	4.5550e-1	9.7513e-2	2.6000e-1	6.3184e-1	1.5458e+0	8.2003e-2	5.6902e-2	2.1806e-1
		(3.79e-2) ≈	(1.44e-1) −	(8.36e-2) −	(1.25e-1) −	(1.36e-2) +	(6.20e-1) −	(8.87e-1) −	(1.52e-1) −	(6.44e-3) +	(1.49e-4) +	(9.46e-2)
	10	2.4725e-1	1.2882e+0	9.6447e-1	3.4755e-1	4.4794e-1	5.0695e-1	8.9905e-1	1.0783e+0	4.5926e-1	3.9253e-1	2.0761e-1
		(3.57e-2) −	(8.57e-1) −	(1.25e-1) −	(1.06e-1) −	(1.65e-2) −	(4.35e-1) −	(6.84e-1) −	(1.66e-1) −	(1.79e-1) −	(2.80e-4) −	(9.84e-2)
	15	2.7032e-1	1.3840e+0	1.6782e+0	2.9401e-1	4.0068e-1	2.7560e+0	2.9557e+0	1.1093e+0	2.6577e+0	9.5912e-2	3.0809e-1
		(1.09e-1) ≈	(1.25e+0) −	(1.16e-1) −	(9.16e-2) ≈	(2.40e-1) ≈	(8.23e-1) −	(3.07e-1) −	(1.01e-1) −	(1.47e+0) −	(2.74e-1) +	(7.65e-2)
	3	4.8990e-1	7.7820e-1	4.5046e-1	4.6600e-1	4.6833e-1	2.8469e-1	1.7134e-1	1.7119e-1	1.7062e-1	2.1540e-1	1.2187e-1
		(2.30e-1) −	(2.50e-1) −	(2.50e-1) −	(8.45e-2) −	(3.95e-1) −	(2.96e-1) −	(4.08e-3) −	(4.28e-3) −	(1.97e-4) −	(1.71e-1) −	(1.62e-2)
DTLZ4	5	3.2100e-1	5.0154e-1	3.7427e-1	2.9592e-1	5.6128e-1	1.7487e-1	3.6578e-1	1.7284e-1	1.7720e-1	2.2426e-1	1.2155e-1
		(6.88e-2) −	(3.25e-1) −	(4.30e-2) −	(1.15e-1) −	(4.76e-1) −	(2.37e-4) −	(3.00e-1) −	(2.84e-3) −	(1.22e-3) −	(1.51e-1) −	(2.59e-2)
	8	2.8266e-1	6.2885e-1	6.6183e-1	1.7345e-1	2.2950e-1	5.6875e-2	3.9571e-1	7.0066e-2	9.5551e-2	1.7753e-1	1.4774e-1
		(4.37e-2) −	(4.01e-1) −	(3.55e-2) −	(1.39e-1) ≈	(3.05e-1) −	(2.94e-4) +	(4.23e-1) ≈	(1.04e-2) +	(8.48e-3) +	(2.06e-1) −	(1.52e-2)
	10	2.9183e-1	1.1021e+0	9.3154e-1	1.0736e-1	8.3950e-1	3.9255e-1	6.8505e-1	5.1233e-1	4.3792e-1	5.7278e-1	1.4376e-1
		(4.49e-2) −	(2.36e-1) −	(1.43e-2) −	(1.20e-1) +	(2.68e-1) −	(3.88e-4) −	(3.01e-1) −	(1.83e-2) −	(6.67e-3) −	(2.01e-1) −	(1.68e-2)
	15	9.5477e-2	1.0635e+0	1.6247e+0	1.0932e-1	1.1064e+0	2.4580e-3	5.3302e-1	1.0326e+0	2.3864e-1	8.4241e-1	1.7425e-1
		(6.52e-2) +	(6.06e-2) −	(6.49e-2) −	(1.30e-1) +	(1.78e-1) −	(5.43e-4) +	(4.67e-1) ≈	(7.55e-2) −	(1.79e-1) −	(1.52e-1) −	(1.37e-2)
	3	5.8887e-1	1.1636e+0	6.5672e-1	8.0173e-1	1.6957e+0	1.6150e+0	9.0821e-1	9.1738e-1	1.1398e+0	6.7424e-1	1.4115e-1
		(2.70e-2) −	(4.38e-1) −	(6.48e-2) −	(5.35e-2) −	(4.77e-2) −	(1.57e-1) −	(8.87e-2) −	(1.75e-1) −	(2.29e-1) −	(1.21e-1) −	(2.87e-2)
DTLZ5	5	3.6855e-1	1.1544e+0	7.4575e-1	3.8086e-1	8.7946e-1	1.2158e+0	7.4570e-1	7.5961e-1	7.0860e-1	6.4226e-1	6.9043e-1
		(3.19e-2) +	(2.62e-1) −	(5.84e-2) −	(6.75e-2) +	(8.34e-2) −	(1.01e-1) −	(8.42e-2) −	(7.16e-2) −	(1.18e-1) ≈	(2.99e-2) +	(7.78e-2)
	8	4.3229e-1	1.1227e+0	9.4549e-1	3.5621e-1	7.7552e-1	1.1258e+0	6.2776e-1	7.3553e-1	9.9087e-1	7.3694e-1	8.5225e-1
		(3.41e-2) +	(3.60e-1) −	(6.01e-2) −	(6.71e-2) +	(7.54e-2) +	(8.69e-2) −	(6.75e-2) +	(6.84e-2) +	(1.26e-1) −	(4.80e-1) ≈	(1.90e-1)
	10	3.2260e-1	1.2802e+0	1.0846e+0	3.2561e-1	8.0450e-1	1.1295e+0	7.6722e-1	7.1401e-1	1.2155e+0	5.8093e-1	1.0391e+0
		(5.18e-2) +	(5.76e-1) ≈	(6.15e-2) ≈	(8.27e-2) +	(5.48e-2) +	(1.03e-1) −	(9.29e-2) +	(1.24e-1) +	(1.55e-1) −	(4.47e-1) +	(1.29e-1)
	15	3.2678e-1	1.0027e+0	1.8671e+0	3.3576e-1	2.0019e+0	1.2653e+0	1.0894e+0	1.5109e+0	1.1350e+0	1.0087e+0	1.2838e+0
		(5.02e-2) +	(1.78e-4) +	(9.41e-2) −	(1.12e-1) +	(3.86e-1) −	(3.78e-1) +	(1.12e-1) +	(3.67e-1) −	(4.46e-1) +	(1.04e+0) +	(1.22e-1)
	3	6.1145e-1	1.0721e+0	5.2126e-1	4.1700e-1	1.8798e+0	1.7807e+0	1.3348e+0	1.7484e+0	9.9880e-1	4.4699e-1	1.4305e-1
		(2.81e-2) −	(2.52e-1) −	(3.06e-2) −	(6.38e-2) −	(1.72e-2) −	(1.09e-1) −	(8.97e-2) −	(1.17e-1) −	(2.75e-1) −	(4.02e-2) −	(1.89e-2)
DTLZ6	5	5.1850e-1	1.0603e+0	8.3803e-1	5.2839e-1	1.0478e+0	8.3871e-1	6.5505e-1	6.9288e-1	7.4599e-1	5.4117e-1	1.2197e+0
		(4.92e-2) +	(1.36e-1) +	(6.98e-2) +	(9.54e-2) +	(6.19e-2) +	(1.41e-1) +	(8.09e-2) +	(5.95e-2) +	(1.26e-1) +	(1.04e-1) +	(1.15e-1)
	8	4.5242e-1	1.0601e+0	1.0815e+0	3.1194e-1	8.4863e-1	9.9748e-1	5.9231e-1	5.6834e-1	1.4638e+0	1.1506e+0	1.5493e+0
		(6.19e-2) +	(5.99e-2) +	(8.50e-2) +	(9.37e-2) +	(1.01e-1) +	(8.17e-2) +	(6.69e-2) +	(4.63e-2) +	(4.56e-1) +	(3.55e-1) +	(8.18e-2)
	10	2.6977e-1	1.0211e+0	1.3754e+0	2.6430e-1	7.0898e-1	1.1024e+0	6.2569e-1	7.9706e-1	1.6803e+0	1.1748e+0	1.6223e+0
		(3.25e-2) +	(4.08e-2) +	(1.34e-1) +	(8.61e-2) +	(8.47e-2) +	(1.52e-1) +	(7.02e-2) +	(5.43e-2) +	(3.47e-1) ≈	(4.17e-1) +	(9.59e-2)
	15	3.0763e-1	1.0039e+0	2.0503e+0	2.5022e-1	1.6363e+0	1.4741e+0	1.1619e+0	1.0031e+0	3.4129e+0	2.8669e+0	1.8999e+0
		(4.81e-2) +	(1.23e-2) +	(8.37e-2) −	(8.78e-2) +	(2.95e-1) +	(3.35e-1) +	(2.01e-1) +	(4.51e-2) +	(8.64e+0) ≈	(7.17e+0) −	(1.11e-1)
	3	3.0962e-1	1.1176e+0	5.7442e-1	4.7578e-1	8.1906e-1	9.2754e-1	6.1823e-1	7.3347e-1	9.2437e-1	3.5100e-1	3.0042e-1
		(4.46e-2) ≈	(8.69e-2) −	(6.28e-2) −	(3.96e-2) −	(1.30e-1) −	(1.25e-1) −	(5.76e-2) −	(5.69e-2) −	(9.98e-2) −	(6.16e-3) −	(4.85e-2)
DTLZ7	5	3.7893e-1	1.1437e+0	6.4973e-1	3.7263e-1	4.4539e-1	8.5164e-1	6.1905e-1	4.0292e-1	1.0275e+0	5.4206e-1	3.1111e-1
		(4.15e-2) −	(1.49e-1) −	(6.28e-2) −	(8.13e-2) −	(5.57e-2) −	(9.50e-2) −	(8.53e-2) −	(3.43e-2) −	(9.01e-2) −	(1.36e-2) −	(3.41e-2)
	8	3.5886e-1	1.0918e+0	1.2287e+0	2.2393e-1	1.5501e-1	9.2693e-1	5.8082e-1	3.4947e-1	1.0057e+0	9.7405e-1	1.8784e-1
		(9.20e-2) −	(1.54e-1) −	(1.98e-2) −	(1.90e-1) ≈	(2.39e-2) +	(9.46e-2) −	(9.79e-2) −	(6.23e-2) −	(6.63e-2) −	(1.92e-2) −	(1.94e-2)
	10	3.3803e-1	1.0672e+0	1.4813e+0	2.1882e-1	1.9148e-1	8.7063e-1	5.5336e-1	4.4560e-1	8.2636e-1	1.1235e+0	1.9705e-1
		(9.76e-2) −	(1.23e-1) −	(2.79e-2) −	(7.70e-2) ≈	(4.79e-2) ≈	(1.24e-1) −	(1.23e-1) −	(1.41e-1) −	(8.79e-2) −	(4.51e-2) −	(2.28e-2)
	15	4.2309e-1	1.4977e+0	1.1082e+0	3.2556e-1	9.6267e-1	1.0414e+0	1.1857e+0	1.6125e+0	1.0127e+0	1.5440e+0	2.4825e-1
		(8.15e-2) −	(9.06e-2) −	(1.37e-1) −	(5.02e-2) −	(1.01e-1) −	(2.49e-2) −	(1.65e-1) −	(4.81e-1) −	(2.86e-2) −	(4.13e-1) −	(4.65e-2)
$+/-/\approx$		11/20/4	7/27/1	3/31/1	11/18/6	13/20/2	12/23/0	10/23/2	8/27/0	9/22/4	14/20/1	

TABLE XIV: Mean and standard deviation of the Spread values obtained by MaOEAIH and other MaOEAs for WFG test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
WFG1	3	3.2390e-1 (1.97e-2) −	1.0865e+0 (2.82e-1) −	4.0944e-1 (2.28e-2) −	7.4766e-1 (4.42e-2) −	3.7710e-1 (1.41e-2) −	3.6089e-1 (1.52e-2) −	3.4629e-1 (2.14e-2) −	4.5860e-1 (6.34e-2) −	3.2320e-1 (2.11e-2) −	3.2980e-1 (1.64e-2) −	2.6898e-1 (4.63e-2)
	5	3.2228e-1 (2.73e-2) +	1.2986e+0 (1.95e-1) −	5.8623e-1 (1.04e-2) −	6.9994e-1 (4.42e-2) −	5.1371e-1 (1.84e-2) +	5.6591e-1 (1.75e-2) ≈	4.9036e-1 (3.66e-3) +	5.1469e-1 (4.63e-2) +	5.0786e-1 (9.33e-2) +	5.2832e-1 (2.28e-2) ≈	5.3642e-1 (6.27e-2)
	8	4.5429e-1 (4.16e-2) +	1.1039e+0 (7.49e-1) −	1.1446e+0 (2.40e-2) −	7.9430e-1 (5.17e-2) +	1.0695e+0 (3.94e-2) −	1.1108e+0 (4.52e-2) −	9.1303e-1 (4.42e-2) −	7.5624e-1 (6.97e-2) +	9.3342e-1 (7.97e-2) −	8.7510e-1 (7.81e-2) ≈	8.4937e-1 (8.73e-2)
	10	5.2583e-1 (4.73e-2) +	1.1206e+0 (5.66e-1) −	1.0494e+0 (8.45e-3) −	8.2441e-1 (6.42e-2) +	9.8157e-1 (1.45e-1) ≈	1.4496e+0 (9.30e-2) −	7.8086e-1 (1.41e-1) +	5.5295e-1 (4.31e-2) +	7.7635e-1 (4.84e-2) +	8.1454e-1 (1.79e-1) +	1.0075e+0 (9.66e-2)
	15	6.0668e-1 (1.06e-1) +	6.9823e-1 (1.52e+0) +	1.8684e+0 (3.86e-2) −	8.9031e-1 (6.84e-2) +	1.3206e+0 (4.68e-2) −	1.8791e+0 (1.77e-1) −	1.7313e+0 (1.52e-1) −	1.7992e+0 (3.79e-1) −	1.7845e+0 (1.94e-1) −	1.0639e+0 (5.00e-2) ≈	1.0708e+0 (1.10e-1)
WFG2	3	5.3508e-1 (3.74e-2) −	1.3303e+0 (3.29e-1) −	3.8173e-1 (3.63e-2) −	6.8246e-1 (7.29e-2) −	3.1005e-1 (1.63e-2) +	3.3269e-1 (6.05e-3) ≈	3.0968e-1 (2.09e-2) +	4.4478e-1 (4.42e-2) −	3.9095e-1 (1.15e-2) −	3.0518e-1 (7.60e-3) +	3.4948e-1 (6.11e-2)
	5	4.2564e-1 (2.90e-2) ≈	1.0952e+0 (5.85e-2) −	5.5740e-1 (4.24e-2) −	5.6629e-1 (6.23e-2) −	4.4657e-1 (1.27e-2) −	5.4401e-1 (3.62e-3) −	4.3483e-1 (4.31e-3) ≈	5.6938e-1 (5.07e-2) −	5.2324e-1 (1.22e-1) −	4.1252e-1 (1.60e-2) ≈	4.0337e-1 (5.73e-2)
	8	4.7631e-1 (2.33e-2) −	1.0338e+0 (2.63e-2) −	1.1495e+0 (7.49e-2) −	5.9662e-1 (7.57e-2) −	1.0187e+0 (1.07e-1) −	1.0483e+0 (6.34e-2) −	9.4083e-1 (5.98e-2) −	8.2462e-1 (8.40e-2) −	9.4444e-1 (6.54e-2) −	7.0080e-1 (2.49e-2) −	3.9669e-1 (3.11e-2)
	10	5.0719e-1 (3.41e-2) −	1.0284e+0 (3.09e-2) −	1.0645e+0 (7.05e-2) −	6.0864e-1 (6.21e-2) −	1.1209e+0 (9.01e-2) −	1.0562e+0 (9.32e-2) −	8.9271e-1 (1.35e-1) −	6.4777e-1 (4.58e-2) −	8.3038e-1 (1.05e-1) −	7.1365e-1 (1.29e-2) −	4.3502e-1 (3.31e-2)
	15	7.6210e-1 (5.23e-2) −	1.0406e+0 (8.86e-2) −	1.8506e+0 (7.38e-2) −	7.4456e-1 (6.94e-2) −	1.1838e+0 (9.92e-2) −	1.0348e+0 (3.62e-2) −	1.6159e+0 (2.49e-1) −	1.4907e+0 (2.16e-1) −	1.3583e+0 (1.41e-1) −	9.8965e-1 (4.45e-2) −	4.7654e-1 (4.03e-2)
WFG3	3	2.5684e-1 (2.28e-2) +	1.0050e+0 (5.97e-3) −	5.8982e-1 (5.49e-2) −	4.0652e-1 (6.07e-2) −	9.2889e-1 (5.30e-2) −	1.0062e+0 (8.24e-2) −	7.4369e-1 (8.15e-2) −	8.2610e-1 (7.08e-2) −	1.2798e+0 (1.72e-1) −	3.1038e-1 (2.29e-2) +	3.6686e-1 (5.33e-2)
	5	2.9142e-1 (3.53e-2) +	NaN (NaN)	6.0102e-1 (3.21e-2) −	3.3491e-1 (6.37e-2) ≈	4.8514e-1 (2.92e-2) −	1.2458e+0 (1.35e-1) −	7.5507e-1 (6.22e-2) −	5.1823e-1 (1.00e-1) −	9.0488e-1 (9.51e-2) −	3.1015e-1 (1.22e-2) ≈	3.2663e-1 (3.85e-2)
	8	3.3833e-1 (3.16e-2) −	1.0058e+0 (2.62e-3) −	9.3207e-1 (4.40e-2) −	3.6232e-1 (5.35e-2) −	9.0925e-1 (3.73e-2) −	1.0357e+0 (9.00e-2) −	8.0240e-1 (9.05e-2) −	7.2404e-1 (1.09e-1) −	1.0594e+0 (9.88e-2) −	6.2108e-1 (1.15e-1) −	1.6447e-1 (2.23e-2)
	10	3.5129e-1 (3.19e-2) −	1.0028e+0 (1.00e-3) −	9.3393e-1 (3.47e-2) −	3.8786e-1 (6.26e-2) −	6.5915e-1 (2.25e-2) −	1.1186e+0 (1.23e-1) −	7.1143e-1 (1.46e-1) −	6.7276e-1 (4.68e-2) −	1.0720e+0 (8.40e-2) −	4.1881e-1 (1.81e-2) −	1.5174e-1 (2.54e-2)
	15	3.7860e-1 (5.34e-2) −	1.0139e+0 (2.69e-3) −	1.4268e+0 (7.04e-2) −	4.9891e-1 (5.85e-2) −	1.5538e+0 (2.22e-2) −	1.4125e+0 (3.30e-1) −	1.4432e+0 (2.52e-1) −	1.1525e+0 (2.29e-1) −	1.3383e+0 (2.74e-1) −	1.5395e+0 (1.11e-1) −	2.1457e-1 (5.66e-2)
WFG4	3	3.2695e-1 (2.17e-2) −	1.3645e+0 (6.78e-1) −	4.1565e-1 (2.03e-2) −	5.6719e-1 (4.93e-2) −	2.9741e-1 (1.60e-2) −	2.8571e-1 (1.64e-4) −	2.8579e-1 (2.16e-4) −	2.8302e-1 (5.34e-3) −	2.8618e-1 (3.20e-4) −	2.8558e-1 (2.81e-3) −	1.2303e-1 (9.99e-3)
	5	2.5528e-1 (2.12e-2) −	1.0508e+0 (1.44e-1) −	4.5303e-1 (3.37e-2) −	4.9076e-1 (5.91e-2) −	2.2912e-1 (2.45e-4) −	2.2911e-1 (2.10e-4) −	2.2906e-1 (1.54e-4) −	2.2671e-1 (4.46e-3) −	2.3009e-1 (1.53e-3) −	2.2917e-1 (6.37e-4) −	8.4706e-2 (1.05e-2)
	8	2.9446e-1 (2.15e-2) −	1.0586e+0 (1.34e-1) −	6.4042e-1 (5.32e-3) −	4.2833e-1 (6.07e-2) −	1.3967e-1 (1.34e-2) −	1.4833e-1 (1.19e-3) −	1.4753e-1 (1.41e-3) −	1.3936e-1 (1.16e-2) −	1.6106e-1 (6.29e-3) −	1.4601e-1 (3.27e-3) −	9.3370e-2 (8.20e-3)
	10	3.3401e-1 (2.96e-2) −	9.5574e-1 (4.35e-1) −	8.4843e-1 (4.03e-2) −	4.6827e-1 (5.99e-2) −	5.4923e-1 (1.75e-2) −	5.1819e-1 (8.17e-4) −	5.1900e-1 (8.38e-4) −	5.3465e-1 (1.43e-2) −	5.3509e-1 (3.57e-3) −	5.0039e-1 (7.48e-3) −	1.1249e-1 (7.86e-3)
	15	4.3432e-1 (3.16e-2) −	8.8122e-1 (9.30e-1) −	1.7073e+0 (6.19e-2) −	6.0010e-1 (5.54e-2) −	6.0760e-1 (1.69e-1) −	4.1898e-2 (6.31e-3) +	1.8575e-1 (3.09e-1) −	1.1502e+0 (2.24e-1) −	1.8635e-1 (7.74e-2) −	1.1947e+0 (3.74e-1) −	1.5568e-1 (7.56e-3)
WFG5	3	3.3270e-1 (2.98e-2) −	1.1922e+0 (4.10e-1) −	4.1250e-1 (1.37e-2) −	5.2173e-1 (4.12e-2) −	2.9908e-1 (1.58e-2) −	2.9049e-1 (4.08e-5) −	2.9051e-1 (4.12e-5) −	2.8961e-1 (2.39e-3) −	2.9722e-1 (9.92e-3) −	2.9062e-1 (2.18e-4) −	1.1919e-1 (1.06e-2)
	5	2.6058e-1 (1.90e-2) −	1.0954e+0 (2.31e-1) −	4.4852e-1 (4.95e-3) −	4.7186e-1 (6.80e-2) −	2.3234e-1 (4.82e-5) −	2.3237e-1 (3.39e-5) −	2.3236e-1 (2.69e-5) −	2.2974e-1 (4.86e-3) −	2.7518e-1 (8.44e-2) −	2.3240e-1 (2.95e-4) −	8.1752e-2 (9.51e-3)
	8	3.1542e-1 (2.84e-2) −	1.0365e+0 (1.13e-1) −	6.4968e-1 (2.42e-2) −	4.6839e-1 (7.22e-2) −	1.4765e-1 (8.85e-3) −	1.5417e-1 (1.58e-4) −	1.5413e-1 (1.24e-4) −	1.3982e-1 (9.82e-3) −	3.5176e-1 (4.11e-2) −	1.5201e-1 (1.76e-3) −	9.7172e-2 (8.31e-3)
	10	3.8828e-1 (3.29e-2) −	1.0443e+0 (1.25e-1) −	8.4628e-1 (3.09e-2) −	4.5292e-1 (7.47e-2) −	5.5037e-1 (1.55e-2) −	5.2036e-1 (1.95e-4) −	5.2038e-1 (1.52e-4) −	5.3165e-1 (7.56e-3) −	5.0595e-1 (7.03e-2) −	5.0760e-1 (4.11e-3) −	1.1139e-1 (8.37e-3)
	15	4.6057e-1 (3.19e-2) −	1.0108e+0 (4.82e-2) −	1.6533e+0 (3.37e-2) −	5.9253e-1 (4.88e-2) −	2.8768e-1 (5.67e-2) −	1.2047e-1 (1.76e-1) +	1.7524e-1 (2.14e-1) −	9.3332e-1 (1.94e-1) −	2.1392e-1 (2.60e-1) −	5.6630e-1 (2.06e-1) −	1.5407e-1 (9.61e-3)
WFG6	3	3.3239e-1 (2.57e-2) −	9.9091e-1 (8.27e-1) −	4.6981e-1 (2.89e-2) −	6.6760e-1 (5.69e-2) −	3.0406e-1 (1.52e-2) −	2.9211e-1 (1.59e-3) −	2.9176e-1 (1.53e-3) −	2.8892e-1 (5.91e-3) −	2.9186e-1 (1.67e-3) −	2.9182e-1 (1.51e-3) −	1.3326e-1 (1.30e-2)
	5	2.5422e-1 (2.53e-2) −	1.1278e+0 (1.73e-1) −	5.2167e-1 (5.73e-2) −	6.1521e-1 (7.17e-2) −	2.3338e-1 (1.09e-3) −	2.3379e-1 (9.23e-4) −	2.3364e-1 (1.12e-3) −	2.2998e-1 (4.87e-3) −	2.3862e-1 (3.02e-2) −	2.3422e-1 (2.22e-3) −	9.2753e-2 (7.04e-3)
	8	2.8293e-1 (2.93e-2) −	8.5243e-1 (8.39e-1) −	7.8171e-1 (1.15e-1) −	5.7841e-1 (8.17e-2) −	1.4580e-1 (1.44e-2) −	1.5623e-1 (1.96e-3) −	1.8392e-1 (1.50e-1) −	1.5522e-1 (2.80e-2) −	1.7357e-1 (2.31e-2) −	1.7576e-1 (3.48e-2) −	1.0031e-1 (9.36e-3)
	10	3.0389e-1 (2.79e-2) −	4.0457e-1 (1.44e+0) −	9.3747e-1 (9.52e-2) −	5.7938e-1 (6.85e-2) −	6.0753e-1 (3.62e-2) −	5.2160e-1 (1.05e-3) −	5.5476e-1 (1.28e-1) −	6.0118e-1 (2.49e-2) −	5.3775e-1 (6.83e-3) −	5.1351e-1 (7.93e-3) −	1.1896e-1 (1.02e-2)
	15	4.9306e-1 (3.59e-2) −	5.2599e-1 (1.58e+0) −	1.7213e+0 (1.60e-1) −	7.5068e-1 (9.54e-2) −	9.4293e-1 (5.27e-1) −	1.0443e-1 (1.89e-2) +	7.6643e-1 (7.09e-1) ≈	1.2536e+0 (2.00e-1) −	3.2928e-1 (1.86e-1) −	1.4339e+0 (1.09e-1) −	1.6235e-1 (7.37e-3)
WFG7	3	3.3220e-1 (2.81e-2) −	2.0857e+0 (1.16e+0) −	4.2021e-1 (1.97e-2) −	4.3222e-1 (4.64e-2) −	3.0642e-1 (1.76e-2) −	2.8573e-1 (8.10e-5) −	2.8575e-1 (1.28e-4) −	2.8919e-1 (5.72e-3) −	2.8621e-1 (3.58e-4) −	2.8603e-1 (3.07e-4) −	1.4286e-1 (2.39e-2)
	5	2.5848e-1 (2.14e-2) −	1.2210e+0 (2.70e-1) −	5.0575e-1 (3.45e-2) −	4.1298e-1 (5.17e-2) −	2.2969e-1 (2.42e-3) −	2.2971e-1 (3.40e-4) −	2.2967e-1 (3.10e-4) −	2.2983e-1 (4.58e-3) −	2.2989e-1 (1.63e-3) −	2.3120e-1 (1.20e-3) −	1.1515e-1 (2.12e-2)
	8	3.1272e-1 (2.92e-2) −	1.6802e+0 (6.55e-1) −	7.1015e-1 (9.74e-2) −	4.9021e-1 (5.24e-2) −	1.5244e-1 (1.60e-2) −	1.5036e-1 (4.71e-3) −	1.8627e-1 (1.32e-1) −	1.5099e-1 (2.52e-2) −	1.6232e-1 (1.41e-2) −	1.6942e-1 (3.54e-2) −	1.0123e-1 (9.53e-3)
	10	3.1574e-1 (3.50e-2) −	1.1218e+0 (9.96e-1) −	8.9439e-1 (1.11e-1) −	4.7447e-1 (6.50e-2) −	5.9340e-1 (1.91e-2) −	5.2460e-1 (4.11e-3) −	5.5776e-1 (9.93e-2) −	5.6491e-1 (1.63e-2) −	5.3755e-1 (1.47e-2) −	5.1922e-1 (7.57e-3) −	1.1602e-1 (1.17e-2)
	15	4.0956e-1 (2.86e-2) −	1.5677e-1 (2.05e+0) −	1.7291e+0 (6.39e-2) −	6.1239e-1 (4.44e-2) −	6.4281e-1 (2.06e-1) −	8.6687e-2 (3.47e-2) +	3.0244e-1 (3.32e-1) ≈	1.4178e+0 (3.73e-1) −	8.5592e-1 (3.70e-1) −	1.2628e+0 (5.94e-1) −	1.5606e-1 (8.66e-3)
WFG8	3	3.3805e-1 (2.94e-2) −	1.0634e+0 (2.01e-1) −	4.8694e-1 (1.96e-2) −	8.6066e-1 (5.38e-2) −	4.7487e-1 (2.97e-2) −	3.5132e-1 (2.83e-2) −	3.3797e-1 (3.34e-2) −	3.8130e-1 (4.63e-2) −	5.3666e-1 (5.95e-2) −	2.4589e-1 (1.08e-2) −	1.6919e-1 (2.56e-2)
	5	2.3258e-1 (2.02e-2) −	1.1184e+0 (1.00e-1) −	5.6653e-1 (4.04e-2) −	7.1279e-1 (6.52e-2) −	2.1790e-1 (1.13e-2) −	2.3500e-1 (2.21e-2) −	2.2620e-1 (1.76e-2) −	2.2037e-1 (5.04e-3) −	5.3544e-1 (6.15e-2) −	2.1692e-1 (1.08e-2) −	1.0925e-1 (1.06e-2)
	8	3.2360e-1 (3.85e-2) −	9.0132e-1 (1.22e+0) −	8.5208e-1 (9.30e-2) −	7.6779e-1 (6.05e-2) −	3.7293e-1 (7.35e-2) −	4.2550e-1 (9.79e-2) −	4.3258e-1 (1.25e-1) −	2.4933e-1 (4.31e-2) −	4.5709e-1 (1.25e-1) −	4.1360e-1 (4.94e-2) −	1.1980e-1 (1.03e-2)
	10	2.7328e-1 (4.71e-2) −	7.0576e-1 (1.95e+0) −	1.0794e+0 (7.08e-2) −	8.2847e-1 (9.34e-2) −	6.4672e-1 (3.20e-2) −	5.3070e-1 (2.33e-2) −	6.0687e-1 (1.07e-1) −	6.3927e-1 (2.93e-2) −	5.5333e-1 (6.73e-2) −	5.0773e-1 (3.32e-2) −	1.2691e-1 (1.04e-2)
	15	3.6182e-1 (1.01e-1) −	-8.5800e-1 (2.45e+0) ≈	1.5666e+0 (7.73e-2) −	1.0201e+0 (1.03e-1) −	1.7939e+0 (2.36e-1) −	1.1005e+0 (1.34e-1) −	9.7201e-1 (9.90e-2) −	1.2776e+0 (1.66e-1) −	1.1436e+0 (8.66e-2) −	1.3053e+0 (1.93e-1) −	1.6380e-1 (8.35e-3)
WFG9	3	3.2134e-1 (2.20e-2) −	1.9139e+0 (8.26e-1) −	4.8111e-1 (2.30e-2) −	4.9495e-1 (7.35e-2) −	3.0649e-1 (1.58e-2) −	2.9227e-1 (3.20e-3) −	2.9446e-1 (4.06e-3) −	2.8043e-1 (1.36e-2) −	4.3408e-1 (4.85e-2) −	2.8755e-1 (5.38e-3) −	1.3999e-1 (1.34e-2)
	5	2.3575e-1 (2.05e-2) −	1.5737e+0 (4.88e-1) −	5.2152e-1 (4.41e-2) −	4.2134e-1 (3.61e-2) −	2.3422e-1 (6.28e-3) −	2.3580e-1 (3.55e-3) −	2.3677e-1 (4.69e-3) −	2.2847e-1 (7.92e-3) −	5.9636e-1 (8.65e-2) −	2.2983e-1 (2.80e-3) −	1.3840e-1 (2.51e-2)
	8	2.7695e-1 (2.92e-2) −	1.3934e+0 (7.43e-1) −	6.8494e-1 (8.58e-2) −	4.2371e-1 (5.76e-2) −	1.4697e-1 (9.25e-3) ≈	1.3335e-1 (6.33e-3) +	1.4163e-1 (1.20e-2) +	1.9081e-1 (2.41e-2) −	3.1589e-1 (2.84e-2) −	1.4375e-1 (6.59e-3) +	1.4998e-1 (1.32e-2)
	10	3.3098e-1 (3.12e-2) −	8.7521e-1 (1.29e+0) −	8.7102e-1 (5.52e-2) −	3.7363e-1 (4.56e-2) −	5.4135e-1 (1.21e-2) −	5.3518e-1 (9.65e-3) −	5.5299e-1 (4.84e-2) −	5.8758e-1 (2.30e-2) −	5.4936e-1 (4.64e-2) −	5.1611e-1 (5.82e-3) −	1.4973e-1 (1.33e-2)
	15	3.9215e-1 (3.10e-2) −	4.5230e-1 (1.85e+0) −	1.5524e+0 (1.09e-1) −	4.4190e-1 (5.94e-2) −	3.1983e-1 (1.04e-1) −	5.2298e-1 (1.90e-1) −	8.4958e-1 (2.06e-1) −	1.0397e+0 (8.24e-2) −	1.1504e+0 (2.09e-1) −	6.7261e-1 (3.76e-1) −	1.7481e-1 (8.71e-3)
$+/-/\approx$		6/38/1	1/42/1	0/45/0	3/41/1	2/41/2	5/38/2	4/38/3	3/42/0	2/43/0	4/36/5	

TABLE XV: Mean and standard deviation of the Spread values obtained by MaOEAIH and other MaOEAs for MAF and IDTLZ test suits

Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	1.7471e-1	2.8237e-1	4.0240e-1	4.2669e-1	9.6970e-1	1.9114e+0	7.5353e-1	1.0341e+0	1.8172e+0	2.6033e-3	1.1489e-1
		(1.98e-2) −	(6.32e-3) −	(1.95e-2) −	(6.69e-2) −	(2.72e-2) −	(9.55e-2) −	(8.08e-2) −	(3.90e-2) −	(1.26e-1) −	(4.17e-3) +	(7.43e-3)
MaF1	5	1.5802e-1	4.7760e-1	8.6662e-1	3.1349e-1	1.4610e+0	1.4224e+0	7.2655e-1	1.5013e+0	1.2719e+0	8.8477e-1	6.6965e-2
		(1.68e-2) −	(1.65e-2) −	(7.63e-2) −	(7.62e-2) −	(3.11e-2) −	(3.37e-1) −	(6.99e-2) −	(7.51e-2) −	(1.80e-1) −	(3.00e-1) −	(7.09e-3)
	8	1.4147e-1	7.7888e-1	9.2800e-1	3.5457e-1	1.0246e+0	9.6563e-1	7.9339e-1	9.2196e-1	1.0755e+0	1.2868e+0	8.6161e-2
		(1.80e-2) −	(5.49e-2) −	(5.33e-2) −	(7.72e-2) −	(8.05e-2) −	(4.07e-2) −	(5.69e-2) −	(2.52e-2) −	(5.47e-2) −	(1.69e-1) −	(7.11e-3)
	10	1.4776e-1	8.5722e-1	1.1999e+0	3.8344e-1	8.2053e-1	9.8614e-1	8.0724e-1	8.4742e-1	1.0163e+0	6.3085e-1	1.0835e-1
		(3.12e-2) −	(8.08e-2) −	(5.02e-2) −	(8.53e-2) −	(6.34e-2) −	(2.21e-2) −	(4.31e-2) −	(2.61e-2) −	(1.99e-2) −	(4.71e+0) −	(6.37e-3)
	15	1.7596e-1	1.0002e+0	1.7553e+0	5.0662e-1	1.0898e+0	1.0165e+0	9.8142e-1	1.0286e+0	1.0240e+0	2.7311e+0	1.5863e-1
		(3.58e-2) ≈	(1.22e-2) −	(6.36e-2) −	(9.24e-2) −	(8.96e-2) −	(1.69e-2) −	(2.14e-2) −	(2.61e-2) −	(1.83e-2) −	(2.65e+0) −	(5.36e-3)
	3	2.0338e-1	9.5040e-1	4.5164e-1	2.5171e-1	7.2931e-1	1.0850e+0	6.9265e-1	6.3239e-1	8.7014e-1	1.4418e-1	1.6668e-1
		(1.80e-2) −	(5.13e-2) −	(5.80e-2) −	(3.81e-2) −	(2.05e-2) −	(8.81e-2) −	(8.27e-2) −	(5.27e-2) −	(6.20e-2) −	(1.99e-3) +	(2.67e-2)
MaF2	5	2.0938e-1	6.6110e-1	6.0824e-1	2.7249e-1	4.8587e-1	1.1214e+0	8.0594e-1	3.9724e-1	1.0933e+0	2.3170e-1	1.6135e-1
		(1.79e-2) −	(1.81e-1) −	(4.41e-2) −	(6.10e-2) −	(3.38e-2) −	(7.74e-2) −	(8.04e-2) −	(1.97e-2) −	(6.71e-2) −	(1.97e-2) −	(1.99e-2)
	8	2.0923e-1	5.9753e-1	8.2435e-1	2.2816e-1	3.8643e-1	1.0682e+0	7.7862e-1	3.0343e-1	9.9835e-1	5.8187e-1	1.0917e-1
		(1.17e-2) −	(4.44e-2) −	(4.98e-2) −	(9.14e-2) −	(4.11e-2) −	(6.03e-2) −	(9.31e-2) −	(3.24e-2) −	(6.90e-2) −	(2.45e-1) −	(7.73e-3)
	10	2.3490e-1	7.4291e-1	9.5741e-1	1.9981e-1	3.7180e-1	1.1756e+0	8.4939e-1	4.0896e-1	8.1851e-1	8.9585e-1	1.0976e-1
		(2.37e-2) −	(3.85e-2) −	(5.94e-2) −	(5.20e-2) −	(2.64e-2) −	(6.23e-2) −	(9.61e-2) −	(3.00e-2) −	(1.29e-1) −	(3.71e-1) −	(8.94e-3)
	15	3.7009e-1	9.5369e-1	1.3571e+0	3.6318e-1	6.6061e-1	1.0544e+0	1.0533e+0	9.1086e-1	1.0036e+0	1.0531e+0	2.6422e-1
		(1.83e-2) −	(2.21e-2) −	(8.79e-2) −	(4.79e-2) −	(8.51e-3) −	(3.46e-2) −	(8.90e-2) −	(7.24e-2) −	(5.75e-3) −	(3.46e-2) −	(4.07e-2)
	3	2.6144e-1	3.4956e+0	3.1142e-1	8.1004e-1	2.4371e-1	2.6065e-1	2.5361e-1	1.2906e+0	2.5373e-1	2.4725e-1	1.2401e-1
		(1.87e-2) −	(1.14e+1) −	(1.21e-2) −	(9.26e-2) −	(2.57e-3) −	(4.72e-4) −	(7.73e-4) −	(5.96e-1) −	(6.27e-5) −	(1.15e-3) −	(1.35e-1)
MaF3	5	2.2399e-1	1.2016e+0	6.0980e-1	1.0121e+0	4.0542e-1	5.6436e-1	4.1715e-1	1.9556e+0	4.1406e-1	4.5107e-1	3.0347e-1
		(2.24e-2) +	(6.49e-1) −	(1.31e-2) −	(5.46e-1) −	(1.62e-2) −	(1.63e-3) −	(5.02e-3) −	(3.34e-1) −	(2.65e-4) −	(1.37e-1) −	(1.08e-1)
	8	2.2943e-1	6.7916e-1	1.1131e+0	1.0028e+0	1.0249e+0	1.4454e+0	8.4840e-1	1.3238e+0	1.6590e+0	7.7238e-1	4.8062e-1
		(2.71e-2) +	(2.97e+0) −	(1.98e-2) −	(7.90e-2) −	(3.84e-2) −	(2.76e-1) −	(1.80e-1) −	(1.90e-1) −	(6.26e-1) −	(5.17e-2) −	(1.96e-1)
	10	4.5669e-1	1.2764e+0	9.5208e-1	9.5932e-1	1.1222e+0	1.8825e+0	5.9745e-1	1.1118e+0	1.9631e+0	6.8456e-1	4.4503e-1
		(3.35e-1) ≈	(8.11e-1) −	(7.62e-2) −	(8.50e-2) −	(4.12e-2) −	(3.55e-1) −	(4.27e-1) −	(1.48e-1) −	(7.85e-1) −	(5.92e-2) −	(7.71e-2)
	15	8.2255e-1	1.0251e+0	1.7984e+0	9.3870e-1	1.1412e+0	3.4518e+0	3.2015e+0	1.7139e+0	1.6277e+3	1.0359e+0	4.8574e-1
		(3.53e-2) −	(1.80e+0) −	(1.44e-1) −	(8.17e-2) −	(2.39e-2) −	(2.37e-1) −	(3.11e-1) −	(3.00e-1) −	(8.89e+3) −	(2.16e-2) −	(8.46e-2)
	3	3.6755e-1	1.1605e+0	5.3177e-1	7.2206e-1	6.2725e-1	1.0763e+0	8.9645e-1	9.6715e-1	8.3474e-1	3.1320e-1	1.1636e-1
		(3.49e-2) −	(4.34e-1) −	(7.63e-2) −	(6.64e-2) −	(4.23e-2) −	(8.62e-2) −	(4.53e-1) −	(4.41e-1) −	(3.57e-1) −	(1.30e-1) −	(1.06e-2)
MaF4	5	3.5806e-1	1.3037e+0	8.0583e-1	6.6050e-1	5.9033e-1	1.0141e+0	1.1328e+0	1.2530e+0	1.1166e+0	5.9479e-1	1.1439e-1
		(3.18e-2) −	(3.06e-1) −	(1.02e-1) −	(7.90e-2) −	(4.16e-2) −	(6.43e-2) −	(4.70e-1) −	(5.98e-1) −	(3.04e-1) −	(1.78e-1) −	(1.71e-2)
	8	5.0292e-1	1.7453e+0	1.0451e+0	7.8207e-1	1.0015e+0	1.0002e+0	9.6271e-1	9.6882e-1	1.0284e+0	-7.4038e-1	1.6517e-1
		(5.18e-2) −	(1.82e+0) −	(6.24e-2) −	(4.85e-2) −	(2.84e-2) −	(2.19e-2) −	(2.15e-2) −	(1.11e-2) −	(5.61e-2) −	(1.20e+1) +	(1.74e-1)
	10	6.1795e-1	-5.7167e-1	1.1095e+0	8.3209e-1	1.0138e+0	1.0125e+0	1.0101e+0	1.0010e+0	1.0382e+0	3.0081e+0	1.3882e-1
		(6.20e-2) −	(7.14e+0) +	(5.87e-2) −	(4.28e-2) −	(4.72e-3) −	(1.46e-2) −	(1.35e-2) −	(6.13e-3) −	(7.30e-2) −	(3.66e+0) −	(3.50e-2)
	15	8.7599e-1	1.2195e+0	1.5859e+0	8.4900e-1	1.0162e+0	1.0092e+0	1.0300e+0	1.0076e+0	1.0251e+0	2.3773e+1	1.5816e-1
		(6.62e-2) −	(1.86e-1) −	(8.23e-2) −	(6.59e-2) −	(1.53e-2) −	(7.12e-3) −	(1.77e-2) −	(5.64e-3) −	(2.44e-2) −	(1.02e+2) −	(1.51e-1)
	3	5.7674e-1	1.0281e+0	6.3132e-1	6.0667e-1	6.0752e-1	3.5723e-1	3.5028e-1	2.8352e-1	2.8576e-1	3.0086e-1	1.2528e-1
		(2.65e-1) −	(8.09e-2) −	(2.27e-1) −	(8.81e-2) −	(3.89e-1) −	(2.18e-1) −	(1.96e-1) −	(6.26e-3) −	(7.90e-5) −	(8.32e-2) −	(1.73e-2)
MaF5	5	3.7620e-1	9.9220e-1	5.2354e-1	5.5611e-1	5.8237e-1	3.2705e-1	3.6906e-1	3.2728e-1	3.2779e-1	3.8933e-1	1.0627e-1
		(2.40e-2) −	(3.36e-1) −	(6.11e-2) −	(1.08e-1) −	(3.79e-1) −	(8.70e-4) −	(1.29e-1) −	(7.55e-3) −	(2.57e-3) −	(1.55e-1) −	(1.65e-2)
	8	7.1650e-1	1.2402e+0	1.0644e+0	8.2357e-1	8.2912e-1	8.3273e-1	8.3185e-1	7.5418e-1	7.5106e-1	9.0609e-1	1.5417e-1
		(7.08e-2) −	(1.66e-1) −	(2.19e-2) −	(8.86e-2) −	(1.14e-1) −	(1.71e-3) −	(4.51e-3) −	(3.14e-2) −	(2.50e-2) −	(1.19e-1) −	(3.29e-2)
	10	1.0127e+0	1.0280e+0	1.5280e+0	1.0899e+0	1.3808e+0	1.2790e+0	1.2777e+0	1.1571e+0	1.2013e+0	1.3207e+0	2.5112e-1
		(7.15e-2) −	(3.78e-2) −	(3.33e-2) −	(9.00e-2) −	(1.44e-1) −	(1.46e-3) −	(2.85e-3) −	(4.16e-2) −	(1.99e-2) −	(2.28e-1) −	(9.24e-2)
	15	1.5094e+0	1.0006e+0	2.0766e+0	1.5999e+0	1.6469e+0	2.0717e+0	2.0710e+0	1.4594e+0	1.6631e+0	1.0532e+0	4.1612e-1
		(8.63e-2) −	(1.13e-3) −	(1.64e-1) −	(6.87e-2) −	(3.14e-1) −	(1.41e-3) −	(3.25e-3) −	(2.31e-1) −	(1.73e-1) −	(8.68e-2) −	(4.55e-2)
	3	6.0237e-1	1.0626e+0	6.5192e-1	8.7575e-1	1.9668e+0	1.8191e+0	1.2339e+0	1.5510e+0	1.2080e+0	6.5425e-1	6.0298e-2
		(3.28e-2) −	(2.74e-1) −	(5.07e-2) −	(5.79e-2) −	(1.88e-1) −	(2.30e-1) −	(1.51e-1) −	(1.59e-1) −	(1.98e-1) −	(4.59e-1) −	(1.64e-2)
MaF6	5	6.3328e-1	1.0853e+0	6.4266e-1	8.6232e-1	2.0194e+0	1.8062e+0	1.4414e+0	1.6716e+0	1.4938e+4	1.9470e+0	9.8131e-2
		(3.31e-2) −	(3.50e-1) −	(4.71e-2) −	(7.42e-2) −	(1.99e-1) −	(3.25e-1) −	(1.76e-1) −	(1.40e-1) −	(4.77e+4) −	(3.94e-1) −	(3.02e-2)
	8	6.3137e-1	1.0005e+0	9.6149e-1	8.1997e-1	2.1469e+0	1.2218e+0	1.2887e+0	2.0276e+0	1.2011e+0	5.3532e+3	2.1722e-1
		(6.36e-2) −	(3.88e-4) −	(1.18e-1) −	(1.22e-1) −	(1.36e-1) −	(3.90e-1) −	(1.95e-1) −	(1.04e-1) −	(1.86e-1) −	(2.78e+4) −	(3.14e-1)
	10	5.5172e-1	1.0006e+0	1.3853e+0	7.1544e-1	1.8217e+0	1.3031e+0	1.0114e+0	1.8622e+0	1.4715e+0	-6.6627e-1	1.2771e+0
		(9.70e-2) +	(3.82e-4) ≈	(3.28e-1) ≈	(1.10e-1) +	(3.63e-1) −	(3.52e-1) ≈	(1.79e-1) ≈	(3.89e-1) −	(1.36e+0) ≈	(3.90e-1) +	(8.58e-1)
	15	5.5498e-1	1.0027e+0	2.1284e+0	4.0258e-1	2.8930e+0	1.8010e+0	1.5755e+0	2.3936e+0	1.1975e+0	8.9654e-1	1.9003e+0
		(7.78e-2) +	(8.15e-4) +	(9.36e-2) −	(9.12e-2) +	(5.55e-1) −	(7.08e-1) ≈	(3.49e-1) +	(3.80e-1) −	(3.24e-1) +	(1.05e+0) +	(2.39e-1)
	3	3.0673e-1	1.1477e+0	5.8097e-1	4.8078e-1	8.0357e-1	9.0381e-1	6.1440e-1	7.3862e-1	9.7962e-1	3.5318e-1	3.0701e-1
		(4.47e-2) ≈	(1.03e-1) −	(5.51e-2) −	(6.96e-2) −	(4.52e-2) −	(9.57e-2) −	(7.95e-2) −	(5.48e-2) −	(1.19e-1) −	(6.29e-3) −	(3.84e-2)
MaF7	5	3.7720e-1	1.1419e+0	6.4485e-1	3.9625e-1	5.1227e-1	8.3517e-1	6.2764e-1	4.1125e-1	9.8677e-1	5.4129e-1	2.8544e-1
		(5.27e-2) −	(1.60e-1) −	(4.31e-2) −	(1.01e-1) −	(1.72e-1) −	(6.15e-2) −	(6.98e-2) −	(3.18e-2) −	(1.22e-1) −	(1.69e-2) −	(3.07e-2)
	8	4.0377e-1	1.0799e+0	1.2214e+0	2.0920e-1	1.6971e-1	9.3888e-1	6.0998e-1	3.6276e-1	9.7651e-1	9.7510e-1	1.9940e-1
		(1.13e-1) −	(1.47e-1) −	(2.44e-2) −	(2.38e-1) ≈	(1.05e-1) +	(8.62e-2) −	(8.69e-2) −	(6.75e-2) −	(8.43e-2) −	(1.89e-2) −	(3.49e-2)
	10	3.5618e-1	1.1259e+0	1.4827e+0	2.3254e-1	1.9349e-1	8.1547e-1	5.2833e-1	3.4619e-1	7.8017e-1	1.1197e+0	1.9466e-1
		(1.14e-1) −	(1.48e-1) −	(2.31e-2) −	(6.80e-2) ≈	(4.51e-2) ≈	(1.35e-1) −	(8.07e-2) −	(1.46e-1) −	(8.63e-2) −	(4.38e-2) −	(1.85e-2)
	15	4.0539e-1	1.4785e+0	1.1541e+0	3.2013e-1	9.7664e-1	1.0431e+0	1.1561e+0	1.5115e+0	1.0181e+0	1.4265e+0	2.4956e-1
		(8.30e-2) −	(1.28e-1) −	(1.58e-1) −	(5.92e-2) −	(9.51e-2) −	(2.85e-2) −	(1.33e-1) −	(3.69e-1) −	(4.76e-2) −	(3.30e-1) −	(4.39e-2)
	3	2.3999e-1	1.0187e+0	6.8129e-1	9.3797e-1	1.2476e+0	1.1525e+0	9.9398e-1	1.1051e+0	1.4215e+0	1.7009e-1	2.9417e-1
		(2.83e-2) +	(3.95e-2) −	(9.52e-2) −	(4.48e-2) −	(9.01e-2) −	(6.80e-2) −	(7.26e-2) −	(6.11e-2) −	(2.22e-1) −	(4.72e-2) +	(3.99e-2)
MaF8	5	2.3742e-1	1.0095e+0	9.9477e-1	9.3242e-1	1.0468e+0	1.0554e+0	1.0748e+0	1.0179e+0	1.7153e+0	9.4769e-1	2.6566e-1
		(2.71e-2) +	(2.66e-2) −	(9.63e-2) −	(4.98e-2) −	(6.95e-2) −	(4.57e-2) −	(5.36e-2) −	(8.59e-2) −	(3.00e-1) −	(9.89e-2) −	(2.72e-2)
	8	2.2731e-1	1.0026e+0	1.2192e+0	9.6583e-1	1.2889e+0	1.0918e+0	1.1264e+0	1.0940e+0	1.0358e+0	1.7944e+0	2.7158e-1
		(2.60e-2) +	(8.34e-3) −	(8.63e-2) −	(5.96e-2) −	(5.37e-2) −	(6.04e-2) −	(5.06e-2) −	(9.17e-2) −	(7.23e-2) −	(1.29e+0) −	(3.51e-2)
	10	2.3031e-1	1.0022e+0	1.2473e+0	9.9011e-1	1.4531e+0	1.0618e+0	1.1065e+0	1.2387e+0	1.0357e+0	9.3066e-2	2.6616e-1
		(2.34e-2) +	(3.38e-3) −	(7.58e-2) −	(6.24e-2) −	(1.13e-1) −	(5.57e-2) −	(6.10e-2) −	(1.02e-1) −	(5.86e-2) −	(6.99e+0) +	(3.05e-2)
	15	2.4415e-1	1.0001e+0	1.5074e+0	1.0463e+0	6.8853e-1	1.0497e+0	1.1575e+0	1.3707e+0	1.0366e+0	5.1374e+0	2.7233e-1
		(1.96e-2) +	(2.16e-4) −	(5.20e-2) −	(6.93e-2) −	(9.36e-2) −	(5.41e-2) −	(9.47e-2) −	(8.60e-2) −	(5.40e-2) −	(1.16e+1) −	(7.79e-2)
	3	1.6798e-1	1.0147e+0	2.1696e-1	1.6029e+0	4.4441e-3	3.3481e-3	3.3325e-3	1.9139e+0	3.3331e-1	3.4523e-3	1.1862e-1
		(1.55e-2) −	(1.42e-1) −	(2.06e-2) −	(4.73e-1) −	(1.21e-3) +	(4.93e-5) +	(3.71e-5) +	(2.23e-1) −	(4.97e-2) −	(6.64e-5) +	(1.11e-2)
MaF9	5	1.3032e-1	1.0183e+0	1.2979e+0	1.5636e+0	7.8092e-1	1.8437e+0	1.9200e+0	1.8259e+0	1.8077e+0	8.4891e-1	2.0660e-1
		(1.53e-2) +	(4.15e-2) −	(3.93e-1) −	(5.37e-1) −	(1.29e-1) −	(3.37e-1) −	(2.45e-1) −	(2.88e-1) −	(2.22e-1) −	(1.81e-1) −	(9.06e-2)
	8	1.4193e-1	1.0222e+0	1.3858e+0	1.4382e+0	9.8362e-1	1.7465e+0	1.8532e+0	1.9389e+0	1.6495e+0	-4.9413e+0	4.4103e-1
		(1.26e-2) +	(3.58e-2) −	(1.52e-1) −	(1.78e-1) −	(1.02e-1) −	(4.45e-1) −	(2.83e-1) −	(2.26e-1) −	(4.42e-1) −	(3.39e+1) +	(8.46e-2)
	10	2.9335e-1	1.0173e+0	1.4774e+0	1.0361e+0	1.1408e+0	2.0190e+0	1.6619e+0	1.7876e+0	1.8476e+0	-1.6746e+0	6.3513e-1
		(6.87e-2) +	(4.36e-2) −	(6.40e-2) −	(1.32e-1) −	(8.19e-2) −	(1.52e-1) −	(1.37e-1) −	(2.82e-1) −	(4.19e-1) −	(1.85e+1) +	(5.72e-2)
	15	1.7743e-1	1.0002e+0	1.7563e+0	1.8469e+0	1.1975e+0	3.4000e+0	2.7512e+0	5.1627e+0	-9.7447e+0	8.0924e-1	5.2919e-1
		(1.82e-2) +	(3.83e-4) −	(2.34e-1) −	(4.80e-1) −	(4.34e-1) −	(3.99e+0) −	(1.03e+0) −	(1.54e+1) −	(6.16e+1) +	(5.84e+0) ≈	(5.16e-1)

(*continued on next page*)

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Problem	M	MaOEAIBP	MaOEAIGD	ARMOEA	KnEA	HEA	tDEA	NSGAIII	TSNSGAII	EFRRR	RVEA	MaOEAIH
	3	3.1771e-1	1.1086e+0	4.2119e-1	7.3378e-1	3.7792e-1	3.6022e-1	3.5260e-1	4.5090e-1	3.2227e-1	3.3370e-1	2.6257e-1
		(2.21e-2) −	(3.32e-1) −	(2.41e-2) −	(4.65e-2) −	(1.31e-2) −	(2.65e-2) −	(2.20e-2) −	(6.40e-2) −	(1.71e-2) −	(1.55e-2) −	(4.44e-2)
MaF10	5	3.3029e-1	1.3350e+0	5.9120e-1	7.1029e-1	5.1826e-1	5.6183e-1	4.9187e-1	5.2102e-1	4.8505e-1	5.3521e-1	5.6176e-1
		(2.99e-2) +	(2.00e-1) −	(1.54e-2) ≈	(4.03e-2) −	(1.09e-2) +	(1.28e-2) ≈	(5.63e-3) +	(5.36e-2) +	(6.18e-3) +	(3.24e-2) +	(6.82e-2)
	8	4.4212e-1	1.2609e+0	1.1546e+0	7.9892e-1	1.0635e+0	1.1115e+0	9.0082e-1	7.5342e-1	9.3839e-1	9.0288e-1	8.6710e-1
		(3.85e-2) +	(1.93e-1) −	(3.85e-2) −	(4.96e-2) +	(3.84e-2) −	(3.85e-2) −	(1.62e-2) −	(6.66e-2) +	(6.78e-2) −	(8.78e-2) ≈	(7.45e-2)
	10	5.3825e-1	9.0082e-1	1.0497e+0	8.2677e-1	9.9115e-1	1.4350e+0	7.7709e-1	5.5837e-1	7.9002e-1	8.0241e-1	1.0012e+0
		(6.28e-2) +	(9.27e-1) +	(1.05e-2) −	(5.40e-2) +	(1.06e-1) ≈	(1.27e-1) −	(9.90e-2) +	(2.60e-2) +	(7.40e-2) +	(1.61e-1) +	(8.17e-2)
	15	5.8414e-1	-7.9281e-1	1.8711e+0	8.9535e-1	1.2840e+0	1.8717e+0	1.7123e+0	1.8734e+0	1.7239e+0	1.0705e+0	1.0733e+0
		(9.25e-2) +	(6.81e+0) +	(1.02e-2) −	(5.11e-2) +	(8.05e-2) −	(2.16e-1) −	(1.94e-1) −	(3.55e-1) −	(2.24e-1) −	(4.20e-2) ≈	(1.27e-1)
	3	5.2901e-1	1.2361e+0	3.9169e-1	6.8921e-1	3.1530e-1	3.3277e-1	3.0302e-1	4.3806e-1	3.9560e-1	3.0319e-1	3.4106e-1
		(3.68e-2) −	(3.27e-1) −	(3.49e-2) −	(5.91e-2) −	(1.38e-2) +	(5.81e-3) ≈	(1.69e-2) +	(5.51e-2) −	(2.86e-2) −	(9.17e-3) +	(6.65e-2)
MaF11	5	4.2637e-1	1.1194e+0	5.6135e-1	5.6124e-1	4.4259e-1	5.4467e-1	4.3457e-1	5.7207e-1	5.0088e-1	4.1468e-1	3.9441e-1
		(2.31e-2) ≈	(7.83e-2) −	(5.04e-2) −	(6.21e-2) −	(2.04e-2) −	(3.63e-3) −	(3.01e-3) −	(5.04e-2) −	(1.06e-1) −	(1.77e-2) ≈	(6.68e-2)
	8	4.8841e-1	1.0316e+0	1.1545e+0	6.1684e-1	9.9932e-1	1.0643e+0	9.1834e-1	8.5357e-1	9.3333e-1	6.9787e-1	3.9567e-1
		(2.68e-2) −	(2.13e-2) −	(7.81e-2) −	(5.76e-2) −	(7.52e-2) −	(5.32e-2) −	(4.34e-2) −	(7.90e-2) −	(4.69e-2) −	(2.14e-2) −	(3.60e-2)
	10	5.0954e-1	1.0172e+0	1.0705e+0	6.1781e-1	1.0963e+0	1.0483e+0	9.0813e-1	6.4334e-1	8.0164e-1	7.0691e-1	4.2400e-1
		(3.08e-2) −	(2.43e-2) −	(7.66e-2) −	(7.01e-2) −	(6.78e-2) −	(7.25e-2) −	(1.43e-1) −	(3.79e-2) −	(8.52e-2) −	(1.38e-2) −	(4.21e-2)
	15	7.5088e-1	1.0113e+0	1.8621e+0	7.3073e-1	1.1847e+0	1.0277e+0	1.7601e+0	1.5378e+0	1.3730e+0	9.9448e-1	4.5573e-1
		(5.79e-2) −	(8.57e-3) −	(5.95e-2) −	(6.88e-2) −	(7.18e-2) −	(2.82e-2) −	(1.98e-1) −	(2.68e-1) −	(1.29e-1) −	(3.82e-2) −	(4.19e-2)
	3	3.1773e-1	1.6553e+0	4.7983e-1	4.7771e-1	3.1377e-1	2.9346e-1	2.9240e-1	2.8530e-1	4.3324e-1	2.8883e-1	1.3723e-1
		(2.45e-2) −	(8.86e-1) −	(2.16e-2) −	(6.14e-2) −	(2.13e-2) −	(4.09e-3) −	(2.87e-3) −	(1.67e-2) −	(4.37e-2) −	(5.01e-3) −	(1.16e-2)
MaF12	5	2.4616e-1	1.4149e+0	5.2026e-1	4.3884e-1	2.3419e-1	2.3626e-1	2.3713e-1	2.3112e-1	5.6888e-1	2.3047e-1	1.3738e-1
		(2.09e-2) −	(8.17e-1) −	(4.60e-2) −	(3.70e-2) −	(4.41e-3) −	(3.72e-3) −	(4.18e-3) −	(8.14e-3) −	(7.25e-2) −	(3.33e-3) −	(1.65e-2)
	8	2.7964e-1	8.5707e-1	6.7579e-1	4.0402e-1	1.4691e-1	1.3258e-1	1.7382e-1	1.9497e-1	3.1444e-1	1.4082e-1	1.5319e-1
		(2.55e-2) −	(1.21e+0) −	(5.85e-2) −	(4.38e-2) −	(1.29e-2) +	(6.80e-3) +	(1.35e-1) −	(3.66e-2) −	(3.33e-2) −	(7.04e-3) +	(1.27e-2)
	10	3.2146e-1	1.5248e+0	8.8315e-1	3.6649e-1	5.4116e-1	5.3006e-1	5.5345e-1	5.8900e-1	5.4541e-1	5.1632e-1	1.4964e-1
		(3.00e-2) −	(7.18e-1) −	(8.54e-2) −	(5.14e-2) −	(1.16e-2) −	(1.96e-2) −	(4.56e-2) −	(2.20e-2) −	(4.58e-2) −	(6.43e-3) −	(1.28e-2)
	15	3.9184e-1	-2.4692e-1	1.5562e+0	4.2425e-1	3.7720e-1	5.1062e-1	7.2154e-1	1.0450e+0	1.1259e+0	6.8178e-1	1.7661e-1
		(3.35e-2) −	(2.26e+0) +	(1.53e-1) −	(7.95e-2) −	(1.14e-1) −	(1.64e-1) −	(2.68e-1) −	(1.38e-1) −	(2.35e-1) −	(2.97e-1) −	(9.15e-3)
	3	3.8172e-1	1.0085e+0	4.7998e-1	8.5253e-1	5.1299e-1	3.5897e-1	4.0033e-1	1.0405e+0	3.8333e-1	1.8652e-1	6.6631e-1
		(3.65e-2) +	(1.43e-1) −	(8.73e-2) +	(1.73e-1) −	(5.41e-2) +	(1.02e-1) +	(1.25e-1) +	(2.48e-1) −	(6.20e-2) +	(6.69e-3) +	(1.15e-1)
MaF13	5	2.8227e-1	1.0107e+0	1.1003e+0	1.8513e+0	1.3521e+0	2.0076e+0	1.8985e+0	1.8657e+0	1.7706e+0	2.5773e+0	6.3132e-1
		(2.80e-2) +	(1.70e-2) −	(2.30e-1) −	(3.89e-1) −	(7.39e-2) −	(1.62e-1) −	(3.72e-1) −	(2.20e-1) −	(4.02e-1) −	(4.31e-1) −	(9.13e-2)
	8	3.3212e-1	1.0068e+0	1.3187e+0	2.0531e+0	1.2458e+0	2.1126e+0	2.0213e+0	2.0962e+0	2.0573e+0	-1.1205e+0	6.6090e-1
		(2.83e-2) +	(6.76e-3) −	(3.11e-1) −	(2.36e-1) −	(9.36e-2) −	(1.62e-1) −	(3.62e-1) −	(1.46e-1) −	(4.35e-1) −	(8.56e+0) ≈	(1.11e-1)
	10	3.5350e-1	1.0028e+0	1.3334e+0	2.0212e+0	1.2150e+0	2.2577e+0	2.2131e+0	2.2860e+0	2.8979e+0	4.9210e-1	6.4426e-1
		(2.98e-2) +	(2.72e-3) −	(2.92e-1) −	(3.28e-1) −	(1.69e-1) −	(1.30e-1) −	(2.24e-1) −	(2.54e-1) −	(7.28e-1) −	(3.53e+0) ≈	(7.55e-2)
	15	4.1447e-1	1.0026e+0	1.5807e+0	2.2379e+0	1.3749e+0	4.3419e+0	3.5975e+0	3.5399e+0	6.7302e+18	8.9426e-1	7.3188e-1
		(3.20e-2) +	(1.99e-3) −	(3.60e-1) −	(1.49e-1) −	(4.59e-1) −	(2.40e+0) −	(5.38e-1) −	(8.20e+0) −	(3.69e+19) ≈	(4.33e+0) ≈	(1.06e-1)
	3	1.8498e-1	1.1871e+0	4.0185e-1	7.3487e-1	9.4266e-1	1.9354e+0	1.1368e+0	1.1324e+0	1.7683e+0	1.2562e-1	1.1719e-1
		(1.34e-2) −	(8.86e-1) −	(1.00e-2) −	(4.42e-1) −	(1.88e-2) −	(1.25e-1) −	(4.36e-1) −	(2.41e-1) −	(2.45e-1) −	(2.47e-1) −	(1.26e-2)
IDTLZ1	5	1.5835e-1	7.1616e-1	9.2946e-1	5.4564e-1	1.5459e+0	1.0791e+0	1.1250e+0	1.5929e+0	1.4189e+0	8.0270e-1	9.4510e-2
		(1.81e-2) −	(3.66e-1) −	(2.39e-1) −	(8.59e-2) −	(5.52e-2) −	(2.23e-1) −	(1.96e-1) −	(2.83e-1) −	(2.28e-1) −	(1.44e-1) −	(1.49e-2)
	8	1.3448e-1	9.7457e-1	1.0284e+0	4.9403e-1	1.0889e+0	1.0250e+0	8.1493e-1	9.5076e-1	1.0812e+0	1.2241e+0	7.9824e-2
		(1.58e-2) −	(1.79e-1) −	(5.15e-2) −	(7.50e-2) −	(1.52e-1) −	(3.62e-2) −	(5.21e-2) −	(2.40e-2) −	(1.11e-1) −	(1.94e-1) −	(2.33e-2)
	10	1.4413e-1	1.1136e+0	1.3269e+0	5.5150e-1	9.3205e-1	1.0145e+0	8.6577e-1	8.8025e-1	1.0809e+0	1.5270e+0	1.0865e-1
		(2.37e-2) −	(2.85e-1) −	(9.39e-2) −	(1.35e-1) −	(1.34e-1) −	(1.69e-2) −	(4.15e-2) −	(6.83e-2) −	(1.14e-1) −	(4.90e-1) −	(8.12e-3)
	15	1.8093e-1	1.0186e+0	1.8247e+0	5.7566e-1	1.0681e+0	1.0198e+0	9.8835e-1	1.0160e+0	1.0547e+0	-4.2629e+0	1.1783e-1
		(4.21e-2) −	(8.21e-2) −	(1.35e-1) −	(1.41e-1) −	(1.03e-1) −	(1.84e-2) −	(2.28e-2) −	(1.22e-2) −	(9.60e-2) −	(3.72e+1) +	(5.25e-2)
	3	3.4113e-1	1.0032e+0	4.6616e-1	4.1135e-1	6.7015e-1	1.1069e+0	7.3875e-1	7.1762e-1	7.0473e-1	1.5793e-1	1.2172e-1
		(2.45e-2) −	(2.09e-2) −	(1.48e-2) −	(6.91e-2) −	(2.61e-2) −	(6.86e-2) −	(7.85e-2) −	(3.67e-2) −	(8.02e-2) −	(6.71e-3) −	(1.38e-2)
IDTLZ2	5	2.4279e-1	1.1453e+0	6.8479e-1	3.0319e-1	3.7877e-1	9.3132e-1	7.2075e-1	6.4391e-1	1.0453e+0	1.9327e-1	1.1499e-1
		(2.41e-2) −	(3.99e-2) −	(6.45e-2) −	(7.69e-2) −	(2.53e-2) −	(7.60e-2) −	(5.30e-2) −	(3.47e-2) −	(1.03e-1) −	(1.03e-1) −	(1.59e-2)
	8	2.0339e-1	1.0110e+0	8.6773e-1	2.9662e-1	8.6608e-1	9.5094e-1	7.5627e-1	9.0074e-1	9.2216e-1	9.4427e-1	1.2339e-1
		(1.82e-2) −	(1.07e-2) −	(6.66e-2) −	(7.54e-2) −	(6.69e-2) −	(4.49e-2) −	(8.66e-2) −	(2.32e-2) −	(4.37e-2) −	(4.42e-2) −	(8.63e-3)
	10	1.8571e-1	8.0092e-1	9.2400e-1	3.4034e-1	6.4056e-1	9.8246e-1	8.7451e-1	8.0188e-1	9.4220e-1	9.6536e-1	1.3270e-1
		(1.58e-2) −	(1.92e-1) −	(6.37e-2) −	(6.50e-2) −	(7.09e-2) −	(2.24e-2) −	(5.00e-2) −	(1.48e-2) −	(3.14e-2) −	(1.67e-1) −	(1.39e-2)
	15	1.7235e-1	9.2798e-1	1.3456e+0	3.7189e-1	1.0384e+0	1.0075e+0	1.0260e+0	1.0085e+0	1.0240e+0	1.1914e+0	1.7827e-1
		(1.85e-2) ≈	(7.48e-3) −	(1.51e-1) −	(5.64e-2) −	(3.26e-2) −	(9.94e-3) −	(2.88e-2) −	(7.53e-3) −	(2.27e-2) −	(8.09e-2) −	(2.33e-2)
$+/-/\approx$		22/48/5	5/69/1	1/72/2	5/68/2	6/67/2	3/68/4	6/68/1	3/72/0	5/68/2	16/52/7	