Supplementary Files for "Differential Enhanced Swarm Optimizer with Particle-Status-Oriented Knowledge Transfer for Multiobjective Multitasking Optimization"

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S-I. Real-world Application Problems

A. Case 1: Optimal Power Flow

TABLE S-I
COMBINATION OF OBJECTIVE FUNCTIONS OF DIFFERENT CASES OF MULTIOBJECTIVE OPTIMAL POWER FLOW PROBLEMS.

	Generation cost	Emission	Power loss	Voltage deviation
Case 1	√	√		
Case 2	√	√	√	
Case 3	√	√		√
Case 4	√	√	√	√

The objective functions and constraints of OPF [1], [2] can be described as

$$\begin{aligned}
\text{Minimize:}\quad & f_1(\mathbf{x}) = \sum_{i=1}^{ng} a_i + b_i P_{G_i} + c_i P_{G_i}^2, \\
& f_2(\mathbf{x}) = \sum_{i=1}^{ng} \alpha_i + \beta_i P_{G_i} + \gamma_i P_{G_i}^2 + \varrho e^{(\phi_i P_{G_i})}, \\
& f_3(\mathbf{x}) = \sum_{i=1}^{n} \sum_{j \neq i}^{n} G_{ij}(V_i^2 + V_j^2 - 2V_i V_j \cos(\delta_i - \delta_j)), \\
& f_4(\mathbf{x}) = \sum_{i=1}^{nl} |V_{L_i} - 1.0|, \\
\text{Subject to:}\quad & P_{G_i}^{\min} \leq P_{G_i} \leq P_{G_i}^{\max},\ i = 1, ..., ng, \\
& Q_{G_i}^{\min} \leq Q_{G_i} \leq Q_{G_i}^{\max},\ i = 1, ..., ng, \\
& V_{G_i}^{\min} \leq V_{G_i} \leq V_{G_i}^{\max},\ i = 1, ..., ng, \\
& Q_{C_j}^{\min} \leq V_{C_j} \leq V_{C_j}^{\max},\ j = 1, ..., nc, \\
& T_k^{\min} \leq T_k \leq T_k^{\max},\ k = 1, ..., nt, \\
& V_{L_m}^{\min} \leq V_{L_m} \leq V_{L_m}^{\max},\ m = 1, ..., nl, \\
& S_{l_n}^{\min} \leq V_{l_n} \leq V_{l_n}^{\max},\ n = 1, ..., n,
\end{aligned} \tag{1}$$

where $\mathbf{x} = (P_{G_2}, ..., P_{G_{ng}}, V_{G_1}, ..., V_{G_{ng}}, Q_{C_1}, ..., Q_{C_{nc}}, T_1, ..., T_{nt})$. Different bus systems constitute different OPF problems according to the above objectives and constraints. Here we use two different bus systems, IEEE-30 and IEEE-57, to form two-task MOMTOPs. IEEE-30 is a relatively easy bus system with 24-dimensional decision variables. IEEE-57 is a more complex bus system with 33-dimensional decision variables. Based on this task combination, a total of four cases are constructed according to different objective combinations as in Table S-I.

B. Case 2: Synchronous Optimal Pulse-width Modulation

TABLE S-II
SYNCHRONOUS OPTIMAL PULSE-WIDTH MODULATION WITH DIFFERENT LEVEL INVERTERS.

Level	D	n	m	$\mathbf{s}$
3	25	1	0.32	[-1,1,-1,1,-1,1,-1,1,-1,1]
5	25	2	0.32	[1,-1,1,1,-1,1,-1,1,-1,-1]
7	25	3	0.36	[1,-1,1,1,1,-1,-1,-1,1,-1]
9	30	4	0.32	[1,1,1,1,-1,1,-1,-1,-1,1,-1,-1]
11	30	5	0.3333	[1,-1,1,1,1,-1,-1,-1,1,1,1,1]
13	30	6	0.32	[1,1,1,-1,1,-1,1,-1,1,1,1,1]

A SOPM problem [3], [4] can be defined as a bi-objective constrained optimization problem as

$$\begin{aligned} \text{Minimize:} \quad & f_1(\mathbf{x}) = \frac{\sqrt{\sum_k (k^{-4})(\sum_{i=1}^{D} s_i \cos(kx_i))^2}}{n\sqrt{\sum_k k^{-4}}}, \\ & f_2(\mathbf{x}) = (nm - \sum_{i=1}^{D} s_i \cos(x_i))^2, \\ \text{Subject to:} \quad & x_{i+1} - x_i - 10^{-5} > 0,\ i = 1, 2, ..., N-1, \\ & 0 < x_i < \tfrac{\pi}{2},\ i = 1, 2, ..., N, \end{aligned} \tag{2}$$

where $\mathbf{x} = (x_1, x_2, ..., x_D)$ and $k = 5, 7, 11, 13, ..., 97$. Six SOPM problems with different levels used in [5] are chosen as optimization tasks and their detailed parameters are shown in Table S-II. The combinations of levels 3, 5, and 7 become the first three-task MOMTOP of SOPM. The combinations of levels 9, 11, and 13 become the second MOMTOP. The tasks in each MOMTOP of SOPM have the same variable dimension, the same variable structure constraints, and different objective functions.

C. Case 3: Sensor Coverage Problem

A bi-objective SCP [6], [7] can be described as

$$\begin{aligned} \text{Minimize:} \quad & f_1(\mathbf{x}) = 1 - \frac{\mathbf{A} \bigcup_{i=1}^{S} \pi r_i^2(x_i, y_i)}{\mathbf{A}}, \\ & f_2(\mathbf{x}) = \sum_{i=1}^{S} (1 + 10 \cdot r_i^2), \\ \text{Subject to:} \quad & -1 < x_i < 1, \\ & -1 < y_i < 1, \\ & 0.1 < r_i < 0.25, \end{aligned} \tag{3}$$

where $\mathbf{x} = (x_1, y_1, r_1, \ldots, x_S, y_S, r_S)$. Since the number of sensors is uncertain, the length of the variables is also uncertain, for each possible variable length is an optimization task. The final result required for multiobjective SCP is the non-dominated solution set after merging all task solution sets. As the set of solutions for different tasks may be in conflict, this type of problem is also called the competitive MOMTOP.

TABLE S-III
SENSOR COVERAGE PROBLEMS.

Problem	T	D	Sensor number
SCP(29-31)	3	[87,90,93]	[29,30,31]
SCP(28-32)	5	[84,87,...,96]	[28,29,...,32]
SCP(27-33)	7	[81,84,...,99]	[27,28,...,33]
SCP(26-34)	9	[78,81,...,102]	[26,28,...,34]
SCP(25-35)	11	[75,78,...,105]	[25,28,...,35]

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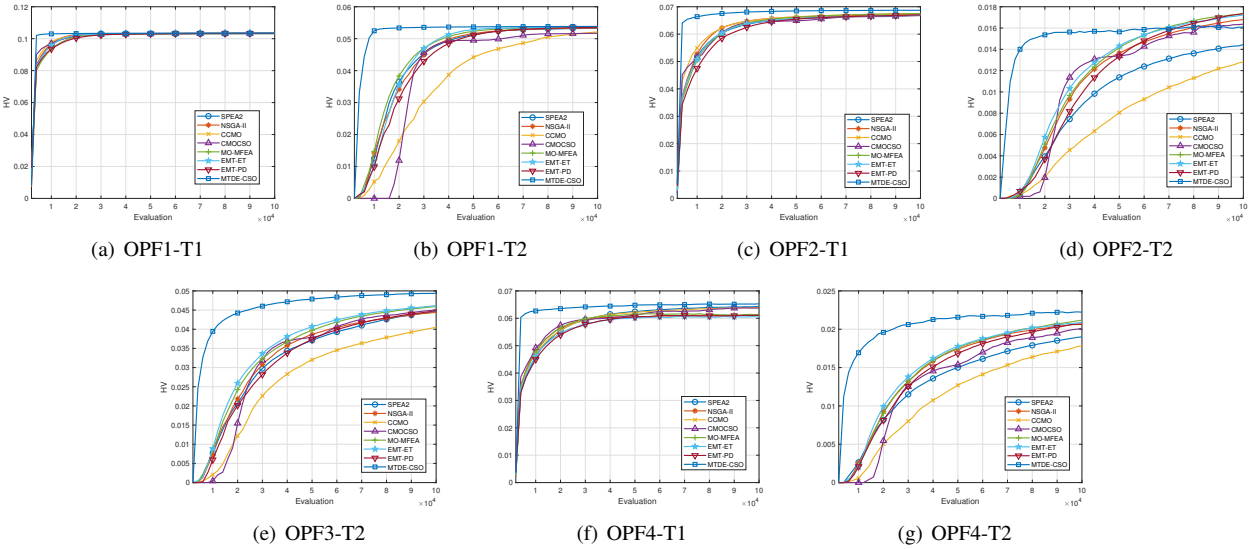
S-II. Detail Results

TABLE S-IV
AVERAGE IGD+ VALUES FOR MTDE-CSO WITH ADVANCED MULTIOBJECTIVE MULTITASKING EVOLUTIONARY ALGORITHMS ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	MO-MFEA	MO-MFEA-II	EMT-ET	EMT-PD	MM-DE	MTDE-CSO
CI-HS-T1	2.7526e-01 (5.27e-02) -	5.8982e-03 (1.31e-03) -	3.1842e-01 (7.11e-02) -	1.3624e-01 (3.37e-02) -	2.1177e-03 (1.02e-04) -	**1.8647e-03 (3.79e-05)**
CI-HS-T2	5.3924e-01 (5.33e-02) -	4.9185e-02 (8.23e-03) -	5.7120e-01 (7.15e-02) -	3.8762e-01 (5.28e-02) -	9.0992e-03 (2.38e-03) -	**4.1421e-03 (5.26e-04)**
CI-MS-T1	8.4006e-03 (6.63e-03) -	7.5786e-03 (5.31e-03) -	1.1366e-02 (1.39e-02) -	7.4195e-03 (6.23e-03) -	2.5719e-03 (8.37e-05) -	**2.4120e-03 (6.07e-05)**
CI-MS-T2	1.3330e-02 (6.73e-03) -	8.5059e-02 (3.68e-01) -	1.5623e-02 (9.98e-03) -	1.2014e-02 (7.63e-03) -	8.2794e-03 (1.17e-02) -	**2.1168e-03 (5.98e-05)**
CI-LS-T1	4.9846e-01 (2.99e-01) -	5.2437e-03 (8.78e-04) -	7.9738e-01 (6.45e-01) -	4.6517e+00 (1.14e+01) -	4.1807e-03 (1.11e-03) -	**2.1266e-03 (1.20e-04)**
CI-LS-T2	1.0724e-02 (2.53e-03) -	3.8843e-03 (2.28e-04) -	1.3870e-02 (5.85e-03) -	6.6918e-02 (1.88e-01) -	3.0177e-03 (1.05e-04) =	**2.9925e-03 (1.32e-04)**
PI-HS-T1	5.9141e-01 (1.43e-01) =	**1.0476e-02 (2.04e-03) +**	8.6186e-01 (2.59e-01) -	4.3966e-01 (3.36e-01) +	2.1168e-02 (9.90e-02) +	5.5601e-01 (2.52e-01)
PI-HS-T2	3.6755e+01 (6.94e+00) -	**5.0757e-01 (3.55e-01) +**	4.8647e+01 (1.01e+01) -	2.7499e+01 (2.05e+01) -	2.6505e+00 (3.92e+00) =	1.7553e+00 (1.13e+00)
PI-MS-T1	9.7155e-01 (1.67e-01) -	1.2955e-01 (3.10e-02) -	1.2824e-01 (2.85e-02) -	4.4897e-01 (5.70e-01) =	1.1912e-01 (4.39e-02) -	**6.8201e-02 (3.83e-02)**
PI-MS-T2	1.1579e+03 (1.38e+02) -	4.0885e+02 (1.29e+02) -	**1.3655e-02 (1.43e-02) +**	4.9093e+02 (5.84e+02) =	2.3597e+02 (4.91e+01) -	2.0661e+02 (1.03e+02)
PI-LS-T1	7.9349e-02 (1.35e-02) -	5.5335e-03 (3.37e-03) =	8.2150e-02 (1.86e-02) -	1.0884e-01 (2.31e-02) -	**2.3234e-03 (2.04e-03) +**	9.4680e-03 (1.29e-02)
PI-LS-T2	3.4474e+00 (2.60e-01) =	2.0041e+01 (1.50e-02) =	**3.3129e+00 (2.19e-01) =**	3.5771e+00 (3.28e-01) =	2.0011e+01 (5.94e-03) =	1.2194e+01 (9.13e+00)
NI-HS-T1	8.8268e+01 (9.28e+00) -	4.7805e+01 (4.10e-01) -	9.2748e+01 (1.15e+01) -	6.8245e+01 (3.82e+00) -	5.9635e+01 (2.55e+01) -	**4.5530e+01 (4.98e-01)**
NI-HS-T2	2.7436e-01 (6.19e-02) -	8.8771e-03 (1.69e-03) -	3.4287e-01 (8.91e-02) -	1.3315e-01 (2.54e-02) -	3.0511e-03 (1.26e-04) -	**2.9727e-03 (1.31e-04)**
NI-MS-T1	1.5576e+01 (1.13e+01) =	3.8437e+01 (3.36e+01) =	**1.0551e+01 (4.77e+00) +**	1.7436e+01 (1.59e+01) =	1.2981e+01 (2.10e+00) +	1.4994e+01 (1.25e+00)
NI-MS-T2	2.5000e-01 (3.90e-01) -	1.0488e+00 (8.92e-01) -	1.6721e-01 (2.23e-01) -	1.1423e-01 (1.30e-01) -	1.4665e-01 (2.42e-01) -	**1.9324e-02 (4.71e-02)**
NI-LS-T1	3.4358e-01 (1.74e-01) +	3.6358e-02 (6.60e-03) +	3.8410e-01 (2.92e-01) =	2.8497e-01 (4.07e-01) +	**3.1628e-02 (5.37e-03) +**	3.6253e-01 (3.95e-01)
NI-LS-T2	2.0335e+01 (7.82e-03) -	2.0295e+01 (2.17e-04) =	1.2406e+01 (9.15e+00) =	**7.4600e+00 (9.97e+00) =**	2.0285e+01 (4.39e-02) =	1.8978e+01 (4.53e+00)
CPLX1-T1	1.1347e-02 (1.68e-03) -	1.4701e-02 (4.79e-03) -	1.2822e-02 (2.12e-03) -	1.2538e-02 (1.70e-03) -	3.6729e-03 (1.33e-04) -	**3.5219e-03 (1.46e-04)**
CPLX1-T2	6.5766e-02 (1.27e-02) -	5.7913e-02 (1.35e-02) -	6.9980e-02 (1.43e-02) -	5.6996e-02 (9.35e-03) -	1.7699e-02 (1.22e-02) -	**7.6296e-03 (3.67e-03)**
CPLX2-T1	6.4462e-03 (4.77e-04) -	7.8201e-03 (4.39e-04) -	6.9223e-03 (6.09e-04) -	7.4883e-03 (9.82e-04) -	3.6545e-03 (1.46e-04) -	**3.5064e-03 (1.59e-04)**
CPLX2-T2	2.3828e-02 (2.73e-03) -	9.7315e-02 (2.38e-02) -	2.6362e-02 (4.05e-03) -	2.9177e-02 (4.16e-03) -	5.4269e-02 (4.10e-02) -	**3.7129e-03 (2.09e-04)**
CPLX3-T1	8.8072e-02 (2.44e-02) -	9.5602e-02 (3.95e-02) -	8.6262e-02 (2.05e-02) -	1.2172e-01 (5.09e-02) -	5.4674e-02 (8.87e-03) -	**4.7798e-02 (1.87e-02)**
CPLX3-T2	2.8227e-02 (3.00e-03) -	5.3542e-02 (2.89e-02) -	2.9956e-02 (4.58e-03) -	3.9146e-02 (1.48e-02) -	3.7132e-02 (5.08e-03) -	**2.0030e-02 (6.39e-03)**
CPLX4-T1	2.2369e-01 (6.79e-02) -	1.5202e-01 (5.88e-02) =	2.2744e-01 (7.82e-02) -	2.6405e-01 (7.78e-02) -	**1.1757e-01 (6.88e-02) +**	1.6248e-01 (1.29e-02)
CPLX4-T2	2.7475e-01 (7.20e-02) -	1.8373e-01 (7.97e-02) +	2.9342e-01 (8.59e-02) -	3.1342e-01 (9.19e-02) -	**1.5381e-01 (9.77e-02) =**	2.3996e-01 (1.13e-02)
CPLX5-T1	2.9634e-02 (7.74e-03) -	5.0066e-02 (1.17e-02) -	2.9556e-02 (6.35e-03) -	2.6819e-02 (4.32e-03) -	2.2885e-02 (4.86e-03) -	**9.2737e-03 (9.93e-04)**
CPLX5-T2	2.0478e-01 (7.44e-02) -	1.1931e-01 (5.66e-02) -	4.1517e-01 (1.46e-01) -	2.1705e-01 (7.55e-02) -	8.9756e-02 (4.20e-02) -	**6.0569e-02 (1.10e-02)**
CPLX6-T1	1.3608e-01 (3.77e-02) -	1.0291e-01 (4.64e-02) =	1.6268e-01 (4.25e-02) -	1.5597e-01 (4.49e-02) -	**6.6921e-02 (6.04e-02) +**	8.7223e-02 (5.15e-02)
CPLX6-T2	3.2396e-01 (5.63e-02) -	1.6275e-01 (7.71e-02) =	3.8494e-01 (7.33e-02) -	3.3463e-01 (9.44e-02) -	**1.2948e-01 (1.01e-01) =**	1.8780e-01 (6.89e-02)
CPLX7-T1	1.7034e-01 (3.74e-02) -	8.5364e-02 (4.55e-02) -	1.9160e-01 (5.66e-02) -	1.9934e-01 (6.95e-02) -	3.0232e-02 (9.96e-03) -	**2.0041e-02 (4.02e-03)**
CPLX7-T2	1.7108e-01 (3.25e-02) -	8.0318e-02 (4.75e-02) -	1.9587e-01 (6.13e-02) -	2.0516e-01 (6.71e-02) -	1.8270e-02 (3.34e-03) =	**1.7943e-02 (2.32e-03)**
CPLX8-T1	8.5244e-02 (3.61e-02) -	1.0154e-01 (4.08e-02) -	9.2620e-02 (2.78e-02) -	1.1605e-01 (5.42e-02) -	**1.8812e-02 (4.73e-03) +**	2.2879e-02 (3.53e-03)
CPLX8-T2	1.5707e-01 (7.85e-02) -	2.7721e-01 (1.52e-01) -	1.8496e-01 (1.19e-01) -	2.2818e-01 (1.55e-01) -	1.0793e-01 (6.08e-02) -	**4.5801e-03 (5.39e-04)**
CPLX9-T1	1.9822e+02 (3.03e+02) -	2.5488e+01 (2.55e+01) -	2.4674e+03 (1.35e+03) -	1.3266e+02 (1.48e+02) -	2.1800e-01 (1.84e-01) -	**1.1698e-01 (9.99e-02)**
CPLX9-T2	2.8342e-01 (5.72e-02) -	2.3854e-01 (7.77e-02) -	3.5188e-01 (6.93e-02) -	3.5757e-01 (7.53e-02) -	1.3415e-01 (1.02e-01) =	**6.6682e-02 (7.98e-03)**
CPLX10-T1	1.2223e-01 (2.69e-02) -	1.6502e-01 (5.52e-02) -	1.6230e-01 (1.22e-01) -	1.4547e-01 (4.09e-02) -	7.6578e-02 (3.03e-02) -	**3.4783e-03 (2.18e-04)**
CPLX10-T2	2.0235e-01 (6.99e-02) -	2.2901e-01 (8.75e-02) -	2.2044e-01 (4.82e-02) -	2.1969e-01 (5.89e-02) -	**9.5761e-02 (2.39e-02) +**	1.1865e-01 (3.66e-02)
+/-/=	1/34/3	4/27/7	2/33/3	2/31/5	8/22/8	-



(a) OPF1-T1 (b) OPF1-T2 (c) OPF2-T1 (d) OPF2-T2

(e) OPF3-T2 (f) OPF4-T1 (g) OPF4-T2

Fig. S-1. The HV convergence plots of MTDE-CSO comparing with other algorithms on optimal power flow problems.

TABLE S-V

AVERAGE HV VALUES FOR MTDE-CSO WITH ADVANCED MULTIOBJECTIVE MULTITASKING EVOLUTIONARY ALGORITHMS ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	MO-MFEA	MO-MFEA-II	EMT-ET	EMT-PD	MM-DE	MTDE-CSO
CI-HS-T1	7.0710e-02 (2.97e-02) -	3.4127e-01 (1.92e-03) -	5.1354e-02 (2.95e-02) -	1.6934e-01 (3.32e-02) -	3.4700e-01 (1.64e-04) -	**3.4738e-01 (7.17e-05)**
CI-HS-T2	2.7500e-02 (1.66e-02) -	3.7945e-01 (1.08e-02) -	2.1578e-02 (1.83e-02) -	9.2661e-02 (2.68e-02) -	4.3448e-01 (3.64e-03) -	**4.4244e-01 (8.94e-04)**
CI-MS-T1	4.3522e-01 (9.67e-03) -	4.3655e-01 (8.02e-03) -	4.3129e-01 (1.91e-02) -	4.3692e-01 (8.95e-03) -	4.4459e-01 (1.33e-04) -	**4.4487e-01 (9.19e-05)**
CI-MS-T2	3.3056e-01 (9.29e-03) -	3.1365e-01 (7.43e-02) -	3.2765e-01 (1.37e-02) -	3.3243e-01 (1.07e-02) -	3.3829e-01 (1.62e-02) -	**3.4702e-01 (1.05e-04)**
CI-LS-T1	2.6841e-02 (2.75e-02) -	3.4223e-01 (1.29e-03) -	1.6396e-02 (2.26e-02) -	9.7864e-02 (8.11e-02) -	3.4390e-01 (1.64e-03) -	**3.4702e-01 (1.99e-04)**
CI-LS-T2	7.0858e-01 (3.40e-03) -	7.1861e-01 (3.30e-04) -	7.0472e-01 (7.33e-03) -	6.5538e-01 (1.70e-01) -	7.1992e-01 (1.57e-04) =	**7.2000e-01 (1.99e-04)**
PI-HS-T1	1.3931e-01 (9.14e-02) =	**7.0886e-01 (2.78e-03) +**	4.6499e-02 (8.23e-02) -	1.3486e-01 (1.09e-01) =	7.0226e-01 (9.46e-02) +	1.9578e-01 (2.38e-01)
PI-HS-T2	0.0000e+00 (0.00e+00) -	**2.5133e-01 (1.40e-01) +**	0.0000e+00 (0.00e+00) -	0.0000e+00 (0.00e+00) =	1.2798e-01 (2.07e-01) =	7.7854e-02 (1.82e-01)
PI-MS-T1	0.0000e+00 (0.00e+00) -	2.0473e-01 (3.86e-02) -	2.0381e-01 (3.60e-02) -	4.4734e-03 (1.61e-02) =	2.1963e-01 (5.10e-02) -	**2.8663e-01 (4.67e-02)**
PI-MS-T2	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00) =	**4.2758e-01 (2.07e-02) +**	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00)
PI-LS-T1	2.3745e-01 (1.94e-02) -	3.4268e-01 (4.79e-03) =	2.3479e-01 (2.53e-02) -	1.9937e-01 (2.82e-02) -	**3.4759e-01 (2.93e-03) +**	3.3749e-01 (1.78e-02)
PI-LS-T2	2.1812e-04 (8.55e-04) -	0.0000e+00 (0.00e+00) -	1.1265e-03 (4.42e-03) -	3.9698e-04 (1.43e-03) -	0.0000e+00 (0.00e+00) -	**1.1740e-01 (1.51e-01)**
NI-HS-T1	1.5683e-04 (8.59e-04) -	2.5408e-01 (1.26e-02) -	0.0000e+00 (0.00e+00) -	4.0735e-03 (1.06e-02) -	1.7731e-01 (1.21e-01) -	**3.2304e-01 (1.45e-02)**
NI-HS-T2	3.9754e-01 (6.30e-02) -	7.1108e-01 (2.31e-03) -	3.3765e-01 (8.38e-02) -	5.5532e-01 (3.12e-02) -	7.1969e-01 (2.03e-04) -	**7.1985e-01 (2.10e-04)**
NI-MS-T1	0.0000e+00 (0.00e+00) =	**2.0370e-02 (1.12e-01) =**	0.0000e+00 (0.00e+00) =	1.9308e-02 (9.85e-02) +	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00)
NI-MS-T2	2.6801e-01 (1.44e-01) -	8.3788e-02 (1.26e-01) -	2.9283e-01 (1.32e-01) -	3.0195e-01 (1.27e-01) -	3.2659e-01 (1.58e-01) -	**4.2380e-01 (5.63e-02)**
NI-LS-T1	1.4910e-01 (1.02e-01) -	5.4977e-01 (1.13e-02) +	2.0173e-01 (1.58e-01) -	7.7772e-03 (1.89e-02) -	**5.5647e-01 (1.01e-02) +**	2.9441e-01 (2.13e-01)
NI-LS-T2	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00) =	**4.1365e-03 (2.27e-02) =**	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00) =	0.0000e+00 (0.00e+00)
CPLX1-T1	9.9993e-01 (1.26e-06) -	9.9967e-01 (5.46e-04) -	9.9992e-01 (1.56e-06) -	9.9993e-01 (1.07e-06) -	9.9992e-01 (4.71e-06) -	**9.9993e-01 (9.21e-07)**
CPLX1-T2	9.9969e-01 (1.80e-04) =	9.9928e-01 (1.07e-03) =	9.9978e-01 (2.46e-04) =	**9.9997e-01 (2.19e-05) +**	9.9954e-01 (6.58e-04) =	9.9968e-01 (4.91e-04)
CPLX2-T1	8.7004e-01 (3.02e-04) -	8.6914e-01 (3.27e-04) -	8.6974e-01 (3.49e-04) -	8.6929e-01 (6.25e-04) -	8.7177e-01 (9.02e-05) -	**8.7191e-01 (1.07e-04)**
CPLX2-T2	**9.9396e-01 (6.57e-05) +**	9.8991e-01 (2.13e-03) -	9.9389e-01 (1.00e-04) +	9.9378e-01 (1.16e-04) +	9.6230e-01 (1.65e-02) -	9.9341e-01 (4.60e-04)
CPLX3-T1	7.4540e-01 (4.40e-02) =	6.8628e-01 (7.86e-02) -	7.4830e-01 (5.41e-02) =	6.8104e-01 (1.14e-01) -	7.4889e-01 (2.51e-02) -	**7.6110e-01 (4.06e-02)**
CPLX3-T2	7.9115e-01 (5.47e-03) -	7.3715e-01 (4.34e-02) -	**8.0864e-01 (5.02e-03) +**	7.6151e-01 (3.27e-02) -	7.5557e-01 (7.31e-03) -	8.0761e-01 (1.57e-02)
CPLX4-T1	9.5679e-01 (2.78e-02) +	9.5260e-01 (2.62e-02) =	9.6150e-01 (2.15e-02) +	9.4444e-01 (2.74e-02) =	**9.6401e-01 (2.78e-02) +**	9.4362e-01 (6.98e-03)
CPLX4-T2	9.5117e-01 (2.86e-02) +	9.4592e-01 (2.91e-02) =	9.5559e-01 (2.25e-02) +	9.3868e-01 (2.82e-02) =	**9.5957e-01 (2.99e-02) +**	9.3641e-01 (6.85e-03)
CPLX5-T1	7.5519e-01 (2.11e-02) -	7.2000e-01 (2.46e-02) -	7.5874e-01 (2.05e-02) -	7.6404e-01 (1.67e-02) -	7.6745e-01 (1.65e-02) -	**7.9243e-01 (4.30e-03)**
CPLX5-T2	9.1713e-01 (5.97e-02) -	9.4360e-01 (7.61e-02) -	8.4092e-01 (9.16e-02) -	9.1419e-01 (5.07e-02) -	9.6137e-01 (5.73e-02) -	**9.8266e-01 (1.55e-03)**
CPLX6-T1	**9.9785e-01 (1.92e-03) =**	9.9772e-01 (1.98e-03) =	9.9745e-01 (1.62e-03) =	9.9751e-01 (2.06e-03) =	9.9776e-01 (2.38e-03) =	9.9687e-01 (2.17e-03)
CPLX6-T2	8.2284e-01 (2.29e-01) +	8.4729e-01 (2.08e-01) +	**8.4787e-01 (2.04e-01) +**	8.1418e-01 (2.03e-01) +	7.8267e-01 (1.85e-01) +	6.8184e-01 (1.72e-01)
CPLX7-T1	9.9928e-01 (1.01e-03) -	9.9856e-01 (1.26e-03) -	9.9948e-01 (3.41e-04) -	9.9913e-01 (1.03e-03) -	9.9923e-01 (3.52e-04) -	**9.9986e-01 (2.14e-04)**
CPLX7-T2	9.5966e-01 (1.19e-01) -	9.2246e-01 (1.71e-01) -	9.9598e-01 (3.04e-03) -	9.6741e-01 (1.56e-01) -	**9.9811e-01 (2.53e-04) =**	9.9803e-01 (3.29e-04)
CPLX8-T1	9.8105e-01 (1.13e-02) -	9.7140e-01 (1.33e-02) -	9.8245e-01 (9.70e-03) -	9.7432e-01 (1.50e-02) -	**9.9350e-01 (3.74e-03) =**	9.9290e-01 (2.37e-03)
CPLX8-T2	9.8093e-01 (3.43e-02) =	9.1649e-01 (7.31e-02) -	9.7820e-01 (5.51e-02) =	9.5826e-01 (7.64e-02) =	9.4376e-01 (4.08e-02) -	**9.9113e-01 (3.40e-03)**
CPLX9-T1	9.5873e-01 (8.89e-02) -	9.9832e-01 (2.58e-03) -	2.6700e-01 (3.15e-01) -	9.8102e-01 (2.85e-02) -	**1.0000e+00 (8.56e-06) =**	1.0000e+00 (2.01e-05)
CPLX9-T2	9.9321e-01 (1.96e-03) -	9.9345e-01 (2.28e-03) -	9.9299e-01 (2.22e-03) -	9.9331e-01 (2.51e-03) -	9.9601e-01 (3.09e-03) -	**9.9761e-01 (8.09e-04)**
CPLX10-T1	8.0657e-01 (2.17e-02) -	7.3171e-01 (5.41e-02) -	6.6614e-01 (2.38e-01) -	7.9483e-01 (2.96e-02) -	8.1692e-01 (2.22e-02) -	**8.6708e-01 (5.24e-03)**
CPLX10-T2	9.2751e-01 (3.34e-02) =	9.2089e-01 (3.71e-02) =	9.2314e-01 (2.75e-02) -	9.1919e-01 (2.67e-02) -	**9.6737e-01 (1.24e-02) +**	9.3880e-01 (1.51e-02)
+/-/=	4/25/9	4/25/9	6/26/6	4/25/9	7/21/10	-

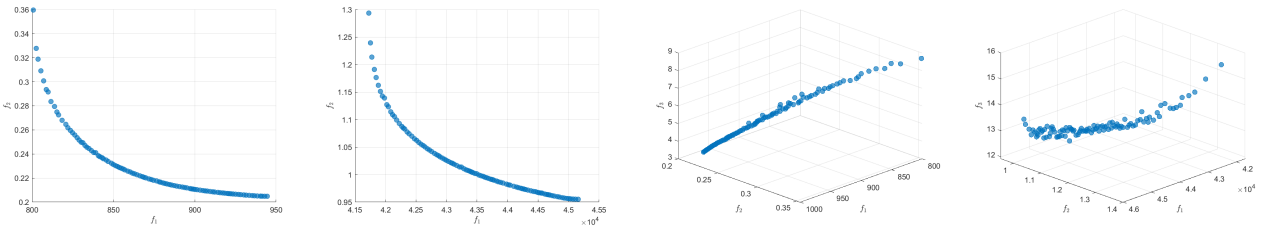
TABLE S-VI

AVERAGE IGD+ VALUES FOR MTDE-CSO WITH NON-MULTITASKING MULTIOBJECTIVE EVOLUTIONARY ALGORITHMS ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

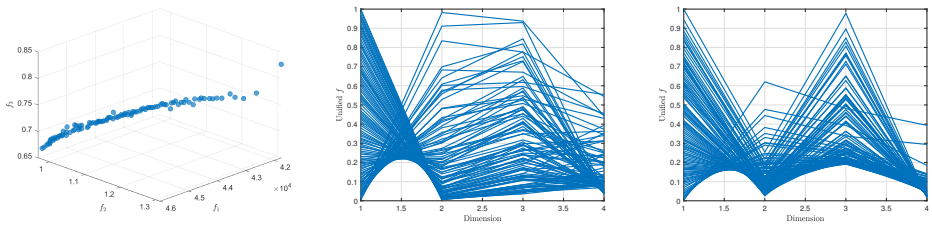
	SPEA2	NSGA-II	NSGA-III	MOEA-D	MOEA-D-DE	MTDE-CSO
CI-HS-T1	1.0957e+00 (2.59e-01) -	1.0292e+00 (1.33e-01) -	3.5732e+00 (7.42e-01) -	4.0753e-01 (6.82e-02) -	5.5442e+00 (7.48e+00) -	**1.8647e-03 (3.79e-05)**
CI-HS-T2	6.1786e-01 (1.09e-01) -	6.5596e-01 (1.11e-01) -	1.4925e+00 (1.76e-01) -	5.8779e-01 (7.32e-02) -	1.1752e+00 (1.01e+00) -	**4.1421e-03 (5.26e-04)**
CI-MS-T1	1.6279e-02 (9.76e-03) -	1.5029e-02 (1.00e-02) -	2.0446e-02 (1.31e-02) -	4.6539e-02 (2.67e-02) -	2.0094e-01 (1.65e-01) =	**2.4120e-03 (6.07e-05)**
CI-MS-T2	7.0606e-01 (5.36e-01) -	9.1771e-01 (8.00e-01) -	7.0222e-01 (7.49e-01) -	6.7871e-01 (5.23e-01) -	**1.9216e-03 (2.11e-05) +**	2.1168e-03 (5.98e-05)
CI-LS-T1	3.3187e+01 (3.69e+00) -	3.5019e+01 (4.50e+00) -	3.7976e+01 (4.44e+00) -	3.5333e+01 (3.59e+00) -	9.2284e+01 (3.03e+01) -	**2.1266e-03 (1.20e-04)**
CI-LS-T2	3.4101e-02 (2.20e-02) -	2.6561e-02 (7.24e-03) -	5.9402e-02 (1.24e-01) -	1.5681e-01 (2.50e-01) -	1.7753e-02 (7.13e-03) -	**2.9925e-03 (1.32e-04)**
PI-HS-T1	5.8554e-01 (2.22e-01) -	6.1332e-01 (1.83e-01) =	2.9320e+00 (6.92e-01) -	**3.0731e-01 (6.76e-02) +**	1.6761e+01 (4.61e+01) -	5.5601e-01 (2.52e-01)
PI-HS-T2	4.1327e+01 (1.16e+01) -	4.3435e+01 (1.47e+01) -	8.5527e+01 (2.64e+01) -	7.1743e+00 (1.54e+00) -	2.2859e+03 (6.81e+02) -	**1.7553e+00 (1.13e+00)**
PI-MS-T1	1.1226e+00 (2.53e-01) -	9.9435e-01 (1.72e-01) -	1.7184e+00 (3.18e-01) -	9.3319e-01 (4.27e-01) -	6.7277e-01 (2.48e-01) -	**6.8201e-02 (3.83e-02)**
PI-MS-T2	1.4837e+03 (4.17e+02) -	1.4300e+03 (4.37e+02) -	1.3663e+03 (3.64e+02) -	1.8132e+03 (7.02e+02) -	7.8157e+02 (1.92e+02) -	**2.0661e+02 (1.03e+02)**
PI-LS-T1	5.9458e-02 (1.38e-02) -	5.0266e-02 (1.12e-02) -	1.1553e-01 (1.81e-02) -	5.1067e-01 (2.58e-01) -	4.2946e-02 (4.28e-02) -	**9.4680e-03 (1.29e-02)**
PI-LS-T2	2.0783e+01 (1.00e-01) -	2.0769e+01 (6.83e-02) -	2.0829e+01 (1.14e-01) -	2.0744e+01 (1.76e-01) -	1.9740e+01 (4.60e-01) =	**1.2194e+01 (9.13e+00)**
NI-HS-T1	5.4362e+02 (7.84e+02) -	5.8643e+02 (8.66e+02) -	1.0690e+03 (7.86e+02) -	4.9530e+02 (1.03e+03) -	3.5434e+04 (2.90e+04) -	**4.5530e+01 (4.98e-01)**
NI-HS-T2	3.9665e-01 (9.48e-02) -	3.5734e-01 (8.85e-02) -	1.9842e+00 (5.71e-01) -	2.3845e-01 (4.59e-02) -	1.6128e+01 (4.03e+01) -	**2.9727e-03 (1.31e-04)**
NI-MS-T1	1.4521e+01 (1.36e+01) =	2.4205e+01 (2.45e+01) =	1.8769e+01 (1.55e+01) =	3.7493e+01 (3.30e+01) =	**4.7125e+00 (3.44e+00) +**	1.4994e+01 (1.25e+00)
NI-MS-T2	9.3387e-01 (8.01e-01) -	1.3356e+00 (1.48e+00) -	2.1057e+00 (1.98e+00) -	7.9017e-01 (4.17e-01) -	2.8321e-01 (1.45e-01) -	**1.9324e-02 (4.71e-02)**
NI-LS-T1	9.2499e-01 (2.75e-01) -	6.4181e-01 (2.86e-01) -	8.3732e-01 (2.03e-01) -	9.7101e-01 (2.94e-01) -	**4.7592e-02 (1.43e-02) +**	3.6253e-01 (3.95e-01)
NI-LS-T2	2.0337e+01 (3.35e-02) -	2.0338e+01 (4.09e-02) -	2.0352e+01 (3.29e-02) -	**1.7976e+01 (5.71e+00) +**	1.9054e+01 (4.76e+00) -	1.8978e+01 (4.53e+00)
CPLX1-T1	9.3807e-03 (1.98e-03) -	1.2149e-02 (1.67e-03) -	2.5908e-02 (3.68e-02) -	3.8956e-02 (1.46e-02) -	**2.4948e-03 (3.39e-05) +**	3.5219e-03 (1.46e-04)
CPLX1-T2	1.2654e-01 (4.63e-02) -	1.4002e-01 (5.84e-02) -	1.5259e-01 (4.99e-02) -	2.3022e-01 (3.92e-02) -	1.1112e-01 (4.19e-02) -	**7.6296e-03 (3.67e-03)**
CPLX2-T1	5.8688e-03 (3.89e-04) -	8.7190e-03 (7.27e-04) -	5.9488e-03 (2.45e-03) -	1.1502e-02 (3.37e-03) -	**2.4984e-03 (3.39e-05) +**	3.5064e-03 (1.59e-04)
CPLX2-T2	6.2805e-02 (4.04e-02) -	6.5118e-02 (4.93e-02) -	1.1149e-01 (7.14e-02) -	2.3932e-01 (7.61e-02) -	4.2434e-01 (3.15e-01) -	**3.7129e-03 (2.09e-04)**
CPLX3-T1	1.4051e-01 (5.77e-02) -	1.2732e-01 (4.71e-02) -	1.3565e-01 (5.22e-02) -	2.4929e-01 (7.57e-02) -	1.6844e-01 (4.49e-02) -	**4.7798e-02 (1.87e-02)**
CPLX3-T2	2.7282e-02 (4.99e-03) -	3.0670e-02 (2.13e-03) -	6.4376e-02 (2.60e-02) -	1.4776e-01 (2.33e-02) -	7.9049e-02 (3.88e-02) -	**2.0030e-02 (6.39e-03)**
CPLX4-T1	4.1420e-01 (1.80e-01) -	3.0962e-01 (1.15e-01) -	2.3367e-01 (7.27e-02) -	2.6605e-01 (5.51e-02) -	2.1414e-01 (3.75e-02) -	**1.6248e-01 (1.29e-02)**
CPLX4-T2	4.3035e-01 (2.14e-01) -	3.3124e-01 (7.05e-02) -	2.7978e-01 (5.91e-02) -	3.1026e-01 (2.24e-02) -	2.9444e-01 (1.39e-02) -	**2.3996e-01 (1.13e-02)**
CPLX5-T1	3.2121e-02 (9.40e-03) -	3.9932e-02 (1.60e-02) -	3.3896e-02 (1.14e-02) -	1.2278e-01 (2.92e-02) -	3.9767e-02 (2.56e-02) -	**9.2737e-03 (9.93e-04)**
CPLX5-T2	1.0737e-01 (2.54e-02) -	4.1019e-01 (1.27e-01) -	7.7757e-02 (4.46e-02) =	1.3216e-01 (1.12e-01) -	**6.0479e-02 (5.99e-03) =**	6.0569e-02 (1.10e-02)
CPLX6-T1	1.5900e-01 (6.53e-02) -	1.4279e-01 (3.83e-02) -	1.4606e-01 (6.00e-02) -	2.1537e-01 (5.13e-02) -	1.4799e-01 (3.02e-02) -	**8.7223e-02 (5.15e-02)**
CPLX6-T2	3.8187e-01 (1.16e-01) -	3.4554e-01 (9.63e-02) -	2.8536e-01 (5.05e-02) -	3.1195e-01 (2.46e-02) -	2.9467e-01 (3.64e-02) -	**1.8780e-01 (6.89e-02)**
CPLX7-T1	2.6932e-01 (1.11e-01) -	2.2651e-01 (8.93e-02) -	1.3635e-01 (4.69e-02) -	2.3671e-01 (6.53e-02) -	1.5050e-01 (7.33e-02) -	**2.0041e-02 (4.02e-03)**
CPLX7-T2	2.7285e-01 (1.06e-01) -	2.0204e-01 (8.16e-02) -	1.4986e-01 (6.00e-02) -	2.1666e-01 (6.27e-02) -	1.5078e-01 (7.53e-02) -	**1.7943e-02 (2.32e-03)**
CPLX8-T1	7.6442e-02 (3.46e-02) -	8.4218e-02 (4.42e-02) -	9.8443e-02 (5.14e-02) -	1.8334e-01 (7.43e-02) -	1.2452e-01 (6.32e-02) -	**2.2879e-02 (3.53e-03)**
CPLX8-T2	1.9605e-01 (1.72e-01) -	2.0056e-01 (1.35e-01) -	2.5928e-01 (1.67e-01) -	3.9741e-01 (1.57e-01) -	5.0610e-01 (2.85e-01) -	**4.5801e-03 (5.39e-04)**
CPLX9-T1	5.4072e+02 (3.10e+02) -	3.6170e+03 (1.44e+03) -	3.6788e-01 (1.35e-01) -	3.5040e-01 (1.28e-01) -	**5.3897e-02 (4.49e-03) +**	1.1698e-01 (9.99e-02)
CPLX9-T2	2.8085e-01 (6.03e-02) -	2.6235e-01 (4.91e-02) -	2.5090e-01 (4.52e-02) -	3.1526e-01 (3.21e-02) -	2.8290e-01 (2.78e-02) -	**6.6682e-02 (7.98e-03)**
CPLX10-T1	9.8874e-02 (2.72e-02) -	1.0612e-01 (2.88e-02) -	1.5242e-01 (3.74e-02) -	3.1073e-01 (1.35e-01) -	5.7871e-02 (1.30e-01) -	**3.4783e-03 (2.18e-04)**
CPLX10-T2	2.1206e-01 (8.14e-02) -	2.3791e-01 (8.76e-02) -	2.1746e-01 (6.08e-02) -	2.5929e-01 (7.52e-02) -	2.5634e-01 (1.21e-01) -	**1.1865e-01 (3.66e-02)**
+/-/=	0/37/1	0/36/2	0/36/2	2/35/1	6/29/3	-

TABLE S-VII
AVERAGE HV VALUES FOR MTDE-CSO WITH NON-MULTITASKING MULTIOBJECTIVE EVOLUTIONARY ALGORITHMS ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	SPEA2	NSGA-II	NSGA-III	MOEA-D	MOEA-D-DE	MTDE-CSO
CI-HS-T1	0 (0) -	0 (0) -	0 (0) -	4.3367e-02 (2.80e-02) -	1.5787e-03 (8.65e-03) -	**3.4738e-01 (7.17e-05)**
CI-HS-T2	1.2406e-02 (1.73e-02) -	9.5835e-03 (1.51e-02) -	0 (0) -	2.5019e-03 (1.31e-02) -	3.7295e-03 (9.14e-03) -	**4.4244e-01 (8.94e-04)**
CI-MS-T1	4.2385e-01 (1.39e-02) -	4.2529e-01 (1.47e-02) -	4.1800e-01 (1.84e-02) -	3.7718e-01 (3.30e-02) -	2.3255e-01 (1.76e-01) =	**4.4487e-01 (9.19e-05)**
CI-MS-T2	5.3349e-02 (9.13e-02) -	5.3181e-02 (8.77e-02) -	8.1994e-02 (1.04e-01) -	5.7754e-02 (8.25e-02) -	**3.4716e-01 (3.51e-05)** +	3.4696e-01 (1.05e-04)
CI-LS-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.4702e-01 (1.99e-04)**
CI-LS-T2	6.8547e-01 (2.69e-02) -	6.9426e-01 (9.02e-03) -	6.6083e-01 (1.13e-01) -	5.6820e-01 (2.03e-01) -	7.0478e-01 (8.74e-03) -	**7.2476e-01 (1.96e-04)**
PI-HS-T1	1.5847e-01 (8.65e-02) -	1.3624e-01 (9.00e-02) =	0 (0) -	**3.8292e-01 (6.46e-02)** +	3.1133e-02 (8.79e-02) -	1.9578e-01 (2.38e-01)
PI-HS-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**7.7854e-02 (1.82e-01)**
PI-MS-T1	0 (0) -	0 (0) -	0 (0) -	1.2971e-02 (3.81e-02) -	6.4595e-03 (1.46e-02) -	**2.8663e-01 (4.67e-02)**
PI-MS-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.4782e-02 (3.32e-02)**
PI-LS-T1	2.6849e-01 (1.94e-02) -	2.8102e-01 (1.58e-02) -	1.9430e-01 (2.08e-02) -	3.0329e-02 (5.22e-02) -	2.9419e-01 (5.16e-02) -	**3.3898e-01 (1.77e-02)**
PI-LS-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.1740e-01 (1.51e-01)**
NI-HS-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.2304e-01 (1.45e-02)**
NI-HS-T2	2.8169e-01 (8.01e-02) -	3.1829e-01 (7.95e-02) -	0 (0) -	4.5248e-01 (4.44e-02) -	4.7985e-02 (1.05e-01) -	**7.1985e-01 (2.10e-04)**
NI-MS-T1	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**1.4787e-01 (2.59e-01)** +	0 (0)
NI-MS-T2	7.1147e-02 (1.00e-01) -	6.2043e-02 (7.74e-02) -	3.2408e-02 (8.28e-02) -	3.5505e-02 (6.63e-02) -	1.4836e-01 (1.51e-01) -	**4.2390e-01 (5.63e-02)**
NI-LS-T1	2.7150e-02 (6.59e-02) -	6.3012e-02 (8.95e-02) -	1.1006e-02 (3.50e-02) -	2.5660e-02 (6.59e-02) -	**5.3013e-01 (2.41e-02)** +	2.9429e-01 (2.12e-01)
NI-LS-T2	0 (0) =	0 (0) =	0 (0) =	0 (0) =	2.3613e-03 (1.29e-02) =	**4.7957e-03 (1.97e-02)**
CPLX1-T1	**9.9997e-01 (3.08e-07)** +	9.9997e-01 (2.41e-06) =	9.9987e-01 (9.72e-05) -	9.8995e-01 (3.68e-03) -	9.9997e-01 (2.28e-06) -	9.9997e-01 (2.44e-06)
CPLX1-T2	9.9893e-01 (4.18e-04) -	9.9884e-01 (3.51e-04) -	9.9893e-01 (4.74e-04) -	9.9817e-01 (3.25e-04) -	9.9886e-01 (2.15e-04) -	**9.9995e-01 (7.55e-05)**
CPLX2-T1	8.8144e-01 (2.23e-04) -	8.7971e-01 (3.86e-04) -	8.7651e-01 (5.30e-03) -	8.4391e-01 (1.67e-02) -	**8.8308e-01 (2.87e-04)** +	8.8285e-01 (9.83e-05)
CPLX2-T2	8.9858e-01 (3.36e-02) -	8.9970e-01 (4.12e-02) -	8.7004e-01 (4.60e-02) -	7.7837e-01 (5.51e-02) -	8.6757e-01 (8.94e-02) -	**9.7192e-01 (5.89e-04)**
CPLX3-T1	6.1415e-01 (6.39e-02) -	6.3624e-01 (5.57e-02) -	6.2250e-01 (6.00e-02) -	4.9933e-01 (6.68e-02) -	5.7141e-01 (5.19e-02) -	**7.4345e-01 (3.15e-02)**
CPLX3-T2	9.1217e-01 (1.12e-02) -	9.1558e-01 (7.55e-03) -	8.3840e-01 (3.11e-02) -	7.4378e-01 (2.38e-02) -	8.2290e-01 (5.63e-02) -	**9.2060e-01 (1.59e-02)**
CPLX4-T1	9.9751e-01 (1.16e-03) +	**9.9771e-01 (1.12e-03)** +	9.9749e-01 (1.06e-03) +	9.9657e-01 (8.56e-04) -	9.9655e-01 (5.35e-04) -	9.9702e-01 (2.40e-04)
CPLX4-T2	**9.9607e-01 (1.27e-03)** +	9.9583e-01 (1.44e-03) =	9.9552e-01 (1.44e-03) =	9.9425e-01 (6.03e-04) -	9.9459e-01 (5.42e-04) -	9.9487e-01 (1.71e-04)
CPLX5-T1	7.4023e-01 (2.11e-02) -	7.2471e-01 (2.95e-02) -	7.3720e-01 (2.36e-02) -	6.1181e-01 (3.37e-02) -	7.3142e-01 (4.68e-02) -	**7.8390e-01 (3.86e-03)**
CPLX5-T2	9.9836e-01 (1.88e-03) =	9.8524e-01 (1.17e-02) -	9.9640e-01 (6.24e-03) =	9.8294e-01 (3.05e-02) -	9.9710e-01 (1.87e-03) -	**9.9885e-01 (2.22e-04)**
CPLX6-T1	9.9396e-01 (2.51e-03) =	**9.9483e-01 (3.20e-03)** =	9.9264e-01 (2.78e-03) =	9.8761e-01 (2.05e-03) -	9.8930e-01 (1.22e-03) -	9.9372e-01 (2.80e-03)
CPLX6-T2	**9.9062e-01 (3.49e-03)** =	9.9015e-01 (2.85e-03) =	9.9023e-01 (3.36e-03) =	9.8704e-01 (1.26e-03) -	9.8767e-01 (1.56e-03) -	9.9046e-01 (3.11e-03)
CPLX7-T1	9.9751e-01 (3.54e-03) -	9.9861e-01 (2.26e-03) -	9.9781e-01 (2.48e-03) -	9.9269e-01 (1.87e-03) -	9.9527e-01 (2.76e-03) -	**9.9991e-01 (1.12e-04)**
CPLX7-T2	9.9830e-01 (1.66e-03) -	9.9790e-01 (1.97e-03) -	9.9765e-01 (1.58e-03) -	9.9441e-01 (1.28e-03) -	9.9599e-01 (2.23e-03) -	**9.9962e-01 (1.88e-04)**
CPLX8-T1	9.8195e-01 (1.23e-02) -	9.8040e-01 (1.33e-02) -	9.7379e-01 (1.52e-02) -	9.4704e-01 (1.65e-02) -	9.6140e-01 (2.18e-02) -	**9.9287e-01 (2.18e-03)**
CPLX8-T2	8.5060e-01 (6.84e-02) -	8.4723e-01 (5.96e-02) -	8.0097e-01 (7.70e-02) -	7.0646e-01 (4.23e-02) -	7.6815e-01 (1.00e-01) -	**9.5887e-01 (2.58e-03)**
CPLX9-T1	1.0841e-02 (3.30e-02) -	0 (0) -	9.7105e-01 (5.40e-02) -	9.2061e-01 (5.25e-02) -	**9.9984e-01 (4.84e-04)** +	9.9952e-01 (2.50e-03)
CPLX9-T2	9.9141e-01 (3.69e-03) -	9.9094e-01 (3.15e-03) -	9.9021e-01 (3.15e-03) -	9.8812e-01 (1.85e-03) -	9.8825e-01 (1.41e-03) -	**9.9620e-01 (1.02e-03)**
CPLX10-T1	7.6645e-01 (4.47e-02) -	7.5822e-01 (4.23e-02) -	7.0419e-01 (4.53e-02) -	5.2396e-01 (1.60e-01) -	7.7372e-01 (1.43e-01) -	**8.3399e-01 (4.42e-03)**
CPLX10-T2	8.1267e-01 (8.65e-02) =	7.5318e-01 (1.24e-01) -	7.6683e-01 (1.02e-01) -	7.5047e-01 (9.51e-02) -	8.3270e-01 (7.11e-02) =	**8.3327e-01 (5.20e-02)**
+/-/=	3/29/6	1/30/7	1/31/6	1/35/2	5/30/3	-



(a) OPF1-T1 (b) OPF1-T2 (c) OPF2-T1 (d) OPF2-T2



(e) OPF3-T2 (f) OPF4-T1 (g) OPF4-T2

Fig. S-2. The final no-dominated solutions plots of MTDE-CSO on optimal power flow problems.

TABLE S-VIII
AVERAGE IGD+ VALUES ON TEN-TASK CEC19-MATMO BENCHMARK SUITES.

	SPEA2	NSGA-II	NSGA-III	MOEA-D	MOEA-D-DE	MO-MFEA	EMT-ET	EMT-PD	MM-DE	MO-SBO	MTDE-CSO
MaTP1-T1	1.0466e+03 (3.07e+03) -	2.3848e+03 (4.33e+03) -	1.8547e+03 (3.84e+03) -	1.4651e+00 (9.33e-01) -	1.7722e+02 (1.17e+02) -	2.6804e+01 (1.17e+01) -	4.4295e+03 (5.71e+03) -	1.9149e+01 (4.34e+00) -	**1.5420e-02 (1.93e-02) +**	4.5452e+02 (1.85e+03) -	2.8081e-02 (1.38e-02)
MaTP1-T2	1.7129e+03 (3.82e+03) -	1.0375e+03 (3.07e+03) -	9.3433e+02 (2.54e+03) -	3.4028e+02 (1.86e+03) -	1.9305e+02 (1.19e+02) -	3.2581e+01 (1.50e+01) -	4.4339e+03 (5.70e+03) -	1.9317e+01 (3.84e+00) -	**1.0852e-02 (1.57e-02) +**	5.2864e+02 (1.84e+03) -	3.4645e-02 (2.98e-02)
MaTP1-T3	1.0491e+03 (4.04e+03) -	1.0364e+03 (3.07e+03) -	8.4418e+02 (2.55e+03) -	1.4513e+00 (5.28e-01) -	1.7934e+02 (1.22e+02) -	3.1084e+01 (1.50e+01) -	4.4180e+03 (5.70e+03) -	1.8478e+01 (4.47e+00) -	**1.3766e-02 (1.74e-02) +**	5.4376e+02 (1.84e+03) -	3.0213e-02 (1.53e-02)
MaTP1-T4	2.0533e+03 (4.10e+03) -	1.0387e+03 (3.07e+03) -	1.1601e+03 (4.05e+03) -	1.3806e+00 (3.83e-01) -	1.7780e+02 (1.24e+02) -	3.1542e+01 (1.01e+01) -	4.4156e+03 (5.70e+03) -	1.9610e+01 (4.82e+00) -	**8.7296e-03 (9.15e-03) +**	5.1927e+02 (1.83e+03) -	4.4923e-02 (4.48e-02)
MaTP1-T5	1.7816e+03 (4.63e+03) -	3.1753e+01 (9.39e+00) -	1.7191e+03 (3.48e+03) -	3.3966e+02 (1.85e+03) -	2.1634e+02 (1.41e+02) -	3.0511e+01 (1.09e+01) -	4.4234e+03 (5.71e+03) -	1.9780e+01 (5.15e+00) -	**2.7703e-02 (8.37e-02) +**	5.4959e+02 (1.89e+03) -	3.9947e-02 (2.63e-02)
MaTP1-T6	1.0441e+03 (3.08e+03) -	1.1168e+03 (3.07e+03) -	5.5160e+02 (1.85e+03) -	6.7750e+02 (2.57e+03) -	2.0093e+02 (1.54e+02) -	3.1643e+01 (1.60e+01) -	4.4291e+03 (5.70e+03) -	1.9215e+01 (5.24e+00) -	**1.1195e-02 (1.43e-02) +**	5.3210e+02 (1.85e+03) -	3.0806e-02 (1.71e-02)
MaTP1-T7	5.6236e+02 (2.02e+03) -	1.0443e+03 (3.08e+03) -	1.0080e+03 (2.67e+03) -	1.3343e+00 (4.05e-01) -	2.4835e+02 (2.11e+02) -	3.0921e+01 (1.11e+01) -	4.4341e+03 (5.70e+03) -	1.7999e+01 (5.40e+00) -	**1.5231e-02 (2.55e-02) +**	5.2809e+02 (1.85e+03) -	2.8900e-02 (4.04e-02)
MaTP1-T8	1.7158e+03 (3.83e+03) -	7.0349e+02 (2.56e+03) -	1.5360e+03 (4.40e+03) -	1.0221e+03 (3.11e+03) -	1.8672e+02 (1.24e+02) -	3.1448e+01 (1.05e+01) -	4.4283e+03 (5.70e+03) -	2.0512e+01 (4.41e+00) -	**2.2939e-02 (7.34e-02) +**	5.5544e+02 (1.84e+03) -	4.0626e-02 (2.89e-02)
MaTP1-T9	1.3776e+03 (3.48e+03) -	1.7099e+03 (4.64e+03) -	5.1468e+02 (1.85e+03) -	1.3307e+00 (3.91e-01) -	2.0782e+02 (1.38e+02) -	3.0489e+01 (1.47e+01) -	4.4233e+03 (5.71e+03) -	1.7678e+01 (3.59e+00) -	**1.9170e-02 (3.72e-02) +**	5.4575e+02 (1.84e+03) -	3.0827e-02 (1.32e-02)
MaTP1-T10	1.0386e+03 (3.08e+03) -	2.3806e+03 (4.33e+03) -	6.4755e+02 (1.94e+03) -	1.3742e+00 (3.28e-01) -	2.0115e+02 (9.36e+01) -	3.1075e+01 (1.49e+01) -	4.4182e+03 (5.71e+03) -	1.7901e+01 (3.77e+00) -	**1.2315e-02 (1.68e-02) +**	5.2887e+02 (1.84e+03) -	4.7484e-02 (5.68e-02)
MaTP2-T1	1.0291e+03 (7.82e+02) -	1.3283e+03 (1.21e+03) -	1.0759e+03 (8.62e+02) -	8.4364e+02 (4.81e+02) -	1.1859e+03 (3.24e+02) -	7.5362e+02 (8.36e+01) -	2.1622e+03 (1.44e+03) -	6.3320e+02 (5.90e+01) -	3.1238e+02 (3.92e+01) -	7.0561e+02 (9.41e+01) -	**2.4140e+02 (4.23e+01)**
MaTP2-T2	1.1235e+03 (1.08e+03) -	1.0288e+03 (7.73e+02) -	1.0366e+03 (7.95e+02) -	7.5347e+02 (1.21e+02) -	1.1475e+03 (2.82e+02) -	7.3535e+02 (7.34e+01) -	2.1491e+03 (1.41e+03) -	5.7381e+02 (6.80e+01) -	3.1631e+02 (3.92e+01) -	7.4002e+02 (1.13e+02) -	**2.0325e+02 (4.90e+01)**
MaTP2-T3	1.2053e+03 (9.36e+02) -	1.0234e+03 (7.25e+02) -	8.5773e+02 (4.58e+02) -	9.7709e+02 (7.71e+02) -	1.1309e+03 (2.58e+02) -	7.7303e+02 (9.86e+01) -	2.1706e+03 (1.43e+03) -	6.4260e+02 (8.77e+01) -	3.3372e+02 (3.41e+01) -	7.7548e+02 (9.64e+01) -	**2.3061e+02 (4.46e+01)**
MaTP2-T4	8.6670e+02 (4.65e+02) -	1.2754e+03 (1.19e+03) -	9.7643e+02 (6.24e+02) -	7.4513e+02 (1.53e+02) -	1.1559e+03 (2.86e+02) -	7.9118e+02 (1.11e+02) -	2.1717e+03 (1.42e+03) -	6.3930e+02 (7.83e+01) -	3.1765e+02 (3.58e+01) -	7.5235e+02 (8.97e+01) -	**2.3441e+02 (4.73e+01)**
MaTP2-T5	1.0105e+03 (7.68e+02) -	1.0425e+03 (7.66e+02) -	9.9427e+02 (7.43e+02) -	8.7835e+02 (6.45e+02) -	1.2375e+03 (2.91e+02) -	7.4388e+02 (7.80e+01) -	2.1523e+03 (1.41e+03) -	5.6756e+02 (6.98e+01) -	3.2267e+02 (3.13e+01) -	7.3820e+02 (7.05e+01) -	**2.1054e+02 (4.61e+01)**
MaTP2-T6	9.3544e+02 (6.28e+02) -	8.9942e+02 (6.48e+02) -	9.2661e+02 (6.39e+02) -	7.8066e+02 (9.47e+01) -	1.1834e+03 (3.13e+02) -	8.0141e+02 (1.11e+02) -	2.1700e+03 (1.42e+03) -	6.7403e+02 (6.35e+01) -	3.1628e+02 (3.67e+01) -	7.4877e+02 (9.83e+01) -	**2.6179e+02 (4.43e+01)**
MaTP2-T7	8.4851e+02 (4.63e+02) -	1.0915e+03 (8.26e+02) -	1.0709e+03 (8.58e+02) -	8.8114e+02 (6.87e+02) -	1.2075e+03 (2.16e+02) -	7.5360e+02 (6.20e+01) -	2.1864e+03 (1.39e+03) -	6.1494e+02 (5.51e+01) -	3.3231e+02 (3.85e+01) -	7.5281e+02 (8.27e+01) -	**2.3453e+02 (6.13e+01)**
MaTP2-T8	9.9975e+02 (7.25e+02) -	1.0313e+03 (7.77e+02) -	1.0825e+03 (8.71e+02) -	9.1825e+02 (6.57e+02) -	1.1777e+03 (2.82e+02) -	7.6766e+02 (7.60e+01) -	2.1537e+03 (1.42e+03) -	6.2149e+02 (7.87e+01) -	3.4107e+02 (2.97e+01) -	7.5171e+02 (1.23e+02) -	**2.2539e+02 (4.44e+01)**
MaTP2-T9	9.4056e+02 (6.16e+02) -	9.7607e+02 (6.16e+02) -	1.0888e+03 (1.09e+03) -	8.3752e+02 (4.74e+02) -	1.2282e+03 (3.09e+02) -	7.7052e+02 (9.32e+01) -	2.1618e+03 (1.37e+03) -	6.5523e+02 (1.09e+02) -	3.3501e+02 (3.74e+01) -	7.3673e+02 (1.04e+02) -	**2.2874e+02 (4.20e+01)**
MaTP2-T10	1.0693e+03 (7.40e+02) -	9.2651e+02 (6.26e+02) -	1.1065e+03 (7.92e+02) -	1.0697e+03 (8.71e+02) -	1.2585e+03 (2.98e+02) -	8.0983e+02 (1.30e+02) -	2.2126e+03 (1.41e+03) -	6.9767e+02 (8.70e+01) -	3.2837e+02 (4.47e+01) -	7.8938e+02 (9.85e+01) -	**2.5270e+02 (5.11e+01)**
MaTP3-T1	1.1161e+00 (4.60e-01) -	1.1607e+00 (6.41e-01) -	1.1860e+00 (4.57e-01) -	1.0006e+00 (1.49e-01) -	9.8814e-01 (1.44e-01) -	1.0561e+00 (1.44e-02) -	1.7862e+00 (1.16e+00) -	1.0042e+00 (3.29e-02) -	**9.8727e-03 (4.33e-03) +**	1.0769e+00 (1.84e-02) -	8.7509e-02 (5.00e-02)
MaTP3-T2	1.3903e+00 (8.72e-01) -	1.1058e+00 (4.59e-01) -	1.4398e+00 (8.68e-01) -	1.0982e+00 (5.02e-01) -	9.8200e-01 (1.01e-01) -	1.0550e+00 (1.24e-02) -	1.7924e+00 (1.17e+00) -	1.0215e+00 (2.07e-02) -	**8.8802e-03 (3.48e-03) +**	1.1195e+00 (3.47e-02) -	8.4553e-02 (3.07e-02)
MaTP3-T3	1.3936e+00 (8.66e-01) -	1.0257e+00 (2.48e-02) -	1.2741e+00 (6.34e-01) -	1.1074e+00 (4.97e-01) -	9.9008e-01 (1.23e-01) -	1.0557e+00 (1.38e-02) -	1.7907e+00 (1.17e+00) -	1.0085e+00 (3.50e-02) -	**1.3570e-02 (1.31e-02) +**	1.1119e+00 (2.95e-02) -	7.9836e-02 (3.79e-02)
MaTP3-T4	1.3626e+00 (8.66e-01) -	1.3529e+00 (8.75e-01) -	1.2421e+00 (5.17e-01) -	1.1808e+00 (6.50e-01) -	9.9164e-01 (1.43e-01) -	1.0569e+00 (1.23e-02) -	1.7916e+00 (1.17e+00) -	1.0068e+00 (3.24e-02) -	**9.6977e-03 (3.73e-03) +**	1.1068e+00 (2.75e-02) -	8.1784e-02 (3.64e-02)
MaTP3-T5	1.1230e+00 (4.71e-01) -	1.2608e+00 (7.65e-01) -	1.3834e+00 (7.68e-01) -	1.1154e+00 (4.99e-01) -	1.0111e+00 (1.14e-01) -	1.0561e+00 (1.21e-02) -	1.7915e+00 (1.17e+00) -	1.0073e+00 (2.64e-02) -	**1.1299e-02 (8.77e-03) +**	1.1094e+00 (2.33e-02) -	8.7033e-02 (3.99e-02)
MaTP3-T6	1.2907e+00 (7.65e-01) -	1.1818e+00 (6.47e-01) -	1.3445e+00 (6.58e-01) -	1.0954e+00 (5.05e-01) -	9.4782e-01 (1.80e-01) -	1.0531e+00 (1.68e-02) -	1.7869e+00 (1.17e+00) -	1.0004e+00 (3.08e-02) -	**8.1365e-03 (3.89e-03) +**	1.1073e+00 (2.41e-02) -	7.0822e-02 (2.96e-02)
MaTP3-T7	1.2212e+00 (6.36e-01) -	1.5087e+00 (1.03e+00) -	1.2739e+00 (6.32e-01) -	1.0679e+00 (5.17e-01) -	9.2634e-01 (1.62e-01) -	1.0503e+00 (1.78e-02) -	1.7892e+00 (1.16e+00) -	1.0008e+00 (3.18e-02) -	**1.1832e-02 (1.00e-02) +**	1.1069e+00 (2.49e-02) -	8.0089e-02 (3.30e-02)
MaTP3-T8	1.4603e+00 (9.54e-01) -	1.1890e+00 (6.43e-01) -	1.6917e+00 (1.27e+00) -	1.0151e+00 (1.54e-01) -	9.8608e-01 (1.58e-01) -	1.0588e+00 (1.19e-02) -	1.7941e+00 (1.16e+00) -	1.0142e+00 (3.33e-02) -	**1.1762e-02 (7.26e-03) +**	1.1080e+00 (2.54e-02) -	8.8379e-02 (4.00e-02)
MaTP3-T9	1.2904e+00 (7.72e-01) -	1.1136e+00 (4.65e-01) -	1.1905e+00 (4.56e-01) -	1.2775e+00 (8.09e-01) -	9.8431e-01 (1.13e-01) -	1.0577e+00 (1.18e-02) -	1.7820e+00 (1.17e+00) -	1.0072e+00 (3.11e-02) -	**1.3857e-02 (8.37e-03) +**	1.1122e+00 (3.05e-02) -	7.9782e-02 (3.62e-02)
MaTP3-T10	1.2099e+00 (6.39e-01) -	1.3699e+00 (1.10e+00) -	1.4109e+00 (1.03e+00) -	1.0706e+00 (4.66e-01) -	9.3435e-01 (1.70e-01) -	1.0611e+00 (9.03e-03) -	1.7911e+00 (1.16e+00) -	1.0250e+00 (2.37e-02) -	**9.7381e-03 (7.92e-03) +**	1.1128e+00 (2.04e-02) -	9.8930e-02 (4.98e-02)
MaTP4-T1	2.3806e+03 (5.67e+03) -	1.0486e+03 (4.02e+03) -	1.5970e+03 (3.43e+03) -	3.0013e+03 (5.35e+03) -	2.6153e+02 (2.30e+02) -	1.7091e+03 (3.78e+03) -	5.5330e+03 (8.20e+03) -	4.8381e+01 (2.09e+01) -	1.1360e+00 (1.19e+00) -	1.5422e+03 (3.43e+03) -	**3.9911e-01 (1.26e-01)**
MaTP4-T2	8.2832e+07 (2.15e+08) -	4.1414e+07 (1.58e+08) -	2.0796e+07 (1.13e+08) -	1.8633e+08 (2.89e+08) -	1.2405e+05 (1.57e+05) -	1.2266e+04 (1.97e+04) -	1.4495e+08 (2.67e+08) -	6.1721e+03 (5.46e+03) -	2.2094e+04 (6.31e+04) -	1.5949e+06 (7.07e+06) -	**4.2924e+02 (5.63e+02)**
MaTP4-T3	2.0287e+01 (4.77e-02) -	2.0307e+01 (4.08e-02) -	2.0369e+01 (5.07e-02) -	2.0289e+01 (5.40e-02) -	1.7048e+01 (2.53e+00) -	7.7407e+00 (4.54e+00) -	1.0228e+01 (5.98e+00) -	6.3750e+00 (3.84e+00) -	1.9906e+01 (3.36e+00) -	1.4821e+01 (3.47e+00) -	**4.3546e+00 (7.82e-01)**
MaTP4-T4	2.0316e+03 (4.06e+03) -	1.0407e+03 (3.05e+03) -	2.2376e+03 (4.02e+03) -	4.0014e+03 (6.21e+03) -	3.4064e+02 (2.37e+02) -	6.8236e+02 (2.37e+03) -	9.0617e+03 (6.04e+03) -	5.5732e+01 (2.39e+01) -	1.2478e+00 (9.32e-01) -	1.3443e+03 (2.50e+03) -	**3.7859e-01 (6.39e-02)**
MaTP4-T5	8.2829e+07 (2.15e+08) -	1.2428e+08 (2.53e+08) -	4.1539e+07 (1.58e+08) -	2.0633e+08 (3.37e+08) =	1.4231e+05 (1.78e+05) -	2.4622e+04 (3.31e+04) -	1.4508e+08 (2.67e+08) -	1.9910e+04 (2.30e+04) -	6.2986e+04 (1.07e+05) -	4.5185e+05 (1.03e+06) -	**2.7946e+02 (3.02e+02)**
MaTP4-T6	2.0294e+01 (4.20e-02) -	2.0298e+01 (5.85e-02) -	2.0362e+01 (4.72e-02) -	2.0308e+01 (4.30e-02) -	1.6482e+01 (2.29e+00) -	8.0811e+00 (4.72e+00) -	9.7869e+00 (5.98e+00) -	5.5475e+00 (2.35e+00) -	2.0591e+01 (1.55e-01) -	1.3860e+01 (3.78e+00) -	**4.3394e+00 (8.37e-01)**
MaTP4-T7	7.0773e+02 (2.53e+03) -	3.0391e+03 (5.96e+03) -	2.2761e+03 (4.01e+03) -	2.0013e+03 (4.07e+03) -	3.7635e+02 (3.83e+02) -	1.4206e+03 (3.44e+03) -	9.0306e+03 (4.03e+03) -	5.9838e+01 (3.45e+01) -	3.0128e+00 (5.78e+00) -	1.8729e+03 (3.39e+03) -	**4.6038e-01 (2.98e-01)**
MaTP4-T8	8.2831e+07 (2.15e+08) -	1.0293e+08 (2.34e+08) -	2.0819e+07 (1.13e+08) -	2.6913e+08 (4.52e+08) -	1.1354e+05 (9.37e+04) -	1.2087e+04 (9.26e+03) -	1.4513e+08 (2.67e+08) -	6.9852e+03 (4.70e+03) -	2.0519e+04 (6.29e+04) -	2.0173e+06 (8.52e+06) -	**5.3144e+02 (6.74e+02)**
MaTP4-T9	2.0285e+01 (2.60e-02) -	2.0305e+01 (5.22e-02) -	2.0368e+01 (4.28e-02) -	2.0312e+01 (6.79e-02) -	1.6994e+01 (2.59e+00) -	8.3285e+00 (4.75e+00) -	1.2639e+01 (6.33e+00) -	6.7140e+00 (3.23e+00) -	2.0654e+01 (1.93e-01) -	1.4931e+01 (3.27e+00) -	**4.5040e+00 (7.74e-01)**
MaTP4-T10	2.7174e+03 (4.50e+03) -	5.0287e+03 (5.72e+03) -	3.3173e+03 (5.29e+03) -	5.0014e+03 (5.72e+03) -	3.2870e+02 (2.64e+02) -	3.9748e+02 (1.82e+03) -	5.5831e+03 (8.06e+03) -	5.1566e+01 (1.97e+01) -	1.1765e+00 (1.03e+00) -	1.2332e+03 (2.54e+03) -	**4.4088e-01 (2.42e-01)**
MaTP5-T1	1.2852e+03 (1.06e+03) -	1.2569e+03 (1.08e+03) -	1.1699e+03 (9.15e+02) -	2.1889e+03 (1.89e+03) -	1.6627e+03 (3.19e+02) -	9.7888e+02 (8.62e+02) -	3.2527e+03 (4.46e+02) -	6.7686e+02 (1.11e+02) -	**4.2003e+02 (4.06e+01) =**	9.9854e+02 (8.61e+02) -	4.3252e+02 (1.10e+02)
MaTP5-T2	1.9704e+00 (1.45e+00) -	1.5672e+00 (1.28e+00) -	1.8441e+00 (1.04e+00) -	8.7554e-01 (9.47e-01) -	1.3281e+00 (1.60e-01) -	1.6173e+00 (1.02e+00) -	3.5068e+00 (1.87e-01) -	1.1290e+00 (8.07e-02) -	5.2079e-01 (1.30e-01) -	1.6150e+00 (6.39e-01) -	**3.5905e-01 (2.09e-02)**
MaTP5-T3	5.6352e+01 (4.86e+00) -	5.5306e+01 (5.99e+00) -	5.5991e+01 (4.01e+00) -	6.5291e+01 (5.42e+00) -	3.4434e+01 (2.84e+00) -	4.4388e+01 (6.24e+00) -	4.8924e+01 (4.40e+00) -	4.1191e+01 (5.05e+00) -	3.7875e+01 (9.38e+00) -	4.6736e+01 (6.35e+00) -	**2.7223e+01 (2.73e+00)**
MaTP5-T4	1.4454e+03 (1.45e+03) -	1.1301e+03 (1.21e+03) -	1.2448e+03 (1.17e+03) -	1.9642e+03 (1.86e+03) -	1.6410e+03 (2.74e+02) -	1.5730e+03 (1.19e+03) -	3.3192e+03 (5.08e+02) -	6.9910e+02 (1.15e+02) -	4.4089e+02 (1.09e+02) =	9.9871e+02 (7.57e+02) -	**4.3693e+02 (8.75e+01)**
MaTP5-T5	1.8172e+00 (1.41e+00) -	1.4425e+00 (1.19e+00) -	1.8846e+00 (1.13e+00) -	9.4372e-01 (1.02e+00) -	1.3919e+00 (2.26e-01) -	1.9504e+00 (1.38e+00) -	3.7037e+00 (6.77e-01) -	1.1423e+00 (7.81e-02) -	4.6658e-01 (9.08e-02) -	1.5623e+00 (6.60e-01) -	**3.7266e-01 (3.29e-02)**
MaTP5-T6	5.6344e+01 (4.94e+00) -	5.7070e+01 (6.05e+00) -	5.4335e+01 (4.98e+00) -	6.6213e+01 (5.59e+00) -	3.3441e+01 (2.34e+00) -	4.2382e+01 (4.52e+00) -	4.5558e+01 (4.32e+00) -	3.9889e+01 (6.18e+00) -	3.8991e+01 (1.01e+01) -	4.5552e+01 (4.19e+00) -	**2.6467e+01 (3.10e+00)**
MaTP5-T7	1.2329e+03 (1.03e+03) -	1.9130e+03 (1.44e+03) -	9.9790e+02 (7.36e+02) -	2.4371e+03 (1.93e+03) -	1.7877e+03 (4.07e+02) -	1.2772e+03 (1.39e+03) -	3.3305e+03 (5.52e+02) -	7.7902e+02 (4.39e+02) -	5.0082e+02 (4.58e+02) -	1.3966e+03 (1.09e+03) -	**3.7552e+02 (7.06e+01)**
MaTP5-T8	1.6569e+00 (1.36e+00) -	1.8905e+00 (1.29e+00) -	1.4451e+00 (6.47e-01) -	1.3468e+00 (1.47e+00) -	1.4014e+00 (1.55e-01) -	1.5215e+00 (9.27e-01) -	3.6959e+00 (7.02e-01) -	1.1404e+00 (6.87e-02) -	5.0719e-01 (1.23e-01) -	1.8705e+00 (1.39e+00) -	**3.6331e-01 (2.47e-02)**
MaTP5-T9	5.5833e+01 (5.09e+00) -	5.6330e+01 (5.11e+00) -	5.4735e+01 (4.10e+00) -	6.6130e+01 (4.50e+00) -	3.2145e+01 (3.22e+00) -	3.7582e+01 (4.21e+00) -	4.0627e+01 (5.95e+00) -	3.6655e+01 (3.89e+00) -	3.9704e+01 (1.07e+01) -	4.2269e+01 (6.28e+00) -	**2.4013e+01 (2.79e+00)**
MaTP5-T10	1.8268e+03 (1.67e+03) -	1.3220e+03 (1.12e+03) -	1.6895e+03 (1.23e+03) -	2.3155e+03 (2.05e+03) -	1.7570e+03 (4.43e+02) -	1.4213e+03 (1.50e+03) -	3.4654e+03 (7.62e+02) -	6.9216e+02 (1.14e+02) -	**4.1817e+02 (3.67e+01) =**	1.0025e+03 (7.47e+02) -	4.4500e+02 (1.10e+02)
MaTP6-T1	1.6568e+08 (2.79e+08) -	1.4489e+08 (2.67e+08) -	6.2195e+07 (1.89e+08) -	1.2992e+08 (3.00e+08) =	8.0706e+04 (1.07e+05) -	1.0815e+04 (1.90e+04) -	2.6907e+08 (3.13e+08) -	5.0832e+03 (3.31e+03) -	2.0747e+04 (6.37e+04) -	7.1202e+04 (7.34e+04) -	**6.6768e+02 (5.17e+02)**
MaTP6-T2	1.4630e+00 (1.04e+00) -	1.4606e+00 (1.00e+00) -	1.8738e+00 (1.29e+00) -	1.2647e+00 (1.50e+00) -	1.3591e+00 (2.05e-01) -	1.4937e+00 (9.38e-01) -	3.3108e+00 (8.72e-01) -	1.2008e+00 (4.82e-01) -	4.7897e-01 (1.31e-01) -	1.7280e+00 (1.09e+00) -	**3.5686e-01 (1.82e-02)**
MaTP6-T3	5.7110e+01 (4.67e+00) -	5.4900e+01 (5.90e+00) -	5.4015e+01 (4.97e+00) -	6.4921e+01 (5.05e+00) -	3.1591e+01 (2.60e+00) -	4.2438e+01 (5.43e+00) -	4.1147e+01 (5.82e+00) -	3.7611e+01 (4.67e+00) -	3.9855e+01 (1.02e+01) -	4.3164e+01 (5.78e+00) -	**2.3616e+01 (2.86e+00)**
MaTP6-T4	1.4493e+08 (2.67e+08) -	1.2354e+08 (2.98e+08) -	6.2234e+07 (1.89e+08) -	2.0701e+08 (4.10e+08) -	1.4685e+05 (2.26e+05) -	1.8270e+04 (4.58e+04) -	2.6907e+08 (3.13e+08) -	7.3417e+03 (5.31e+03) -	1.5000e+04 (3.04e+04) -	3.4017e+05 (4.21e+05) -	**3.9177e+02 (4.64e+02)**
MaTP6-T5	1.2174e+00 (7.62e-01) -	1.5795e+00 (1.33e+00) -	2.0674e+00 (1.64e+00) -	1.1415e+00 (1.37e+00) -	1.3765e+00 (1.84e-01) -	1.3306e+00 (7.76e-01) -	3.4448e+00 (4.94e-01) -	1.1177e+00 (8.23e-02) -	4.8409e-01 (1.35e-01) -	1.9158e+00 (1.00e+00) -	**3.6712e-01 (2.74e-02)**
MaTP6-T6	5.6778e+01 (4.49e+00) -	5.8385e+01 (5.52e+00) -	5.4244e+01 (5.75e+00) -	6.6890e+01 (3.41e+00) -	3.3370e+01 (3.26e+00) -	4.2965e+01 (5.40e+00) -	4.4519e+01 (4.95e+00) -	4.1903e+01 (4.42e+00) -	4.2457e+01 (1.05e+01) -	4.5838e+01 (6.32e+00) -	**2.6774e+01 (3.27e+00)**
MaTP6-T7	4.1634e+07 (1.58e+08) -	8.2849e+07 (2.15e+08) -	2.0374e+05 (2.27e+05) -	2.4844e+08 (3.50e+08) -	1.1772e+05 (2.20e+05) -	2.3060e+04 (4.67e+04) -	2.6913e+08 (3.13e+08) -	1.1624e+04 (1.22e+04) -	8.5851e+04 (1.19e+05) -	3.5176e+05 (2.85e+05) -	**2.6196e+02 (1.97e+02)**
MaTP6-T8	2.1856e+00 (1.65e+00) -	1.4784e+00 (1.07e+00) -	1.5508e+00 (7.76e-01) -	1.8009e+00 (1.79e+00) -	1.4169e+00 (1.44e-01) -	1.6087e+00 (1.26e+00) -	3.5716e+00 (1.41e-01) -	1.1566e+00 (8.72e-02) -	5.6379e-01 (1.76e-01) -	2.1011e+00 (1.10e+00) -	**3.6612e-01 (3.00e-02)**
MaTP6-T9	5.6880e+01 (4.93e+00) -	5.4706e+01 (4.80e+00) -	5.4673e+01 (5.40e+00) -	6.5867e+01 (4.13e+00) -	3.1905e+01 (2.01e+00) -	3.6646e+01 (4.07e+00) -	3.9441e+01 (5.86e+00) -	3.7850e+01 (3.75e+00) -	3.9719e+01 (8.34e+00) -	4.3631e+01 (6.23e+00) -	**2.2586e+01 (2.20e+00)**
MaTP6-T10	1.2422e+08 (3.01e+08) -	6.2147e+07 (1.90e+08) -	1.0362e+08 (2.35e+08) -	1.8633e+08 (3.32e+08) -	4.2285e+05 (7.93e+05) -	1.4349e+04 (1.82e+04) -	2.6909e+08 (3.13e+08) -	8.3163e+03 (9.94e+03) -	2.9590e+04 (7.57e+04) -	3.0711e+05 (2.83e+05) -	**4.6319e+02 (5.97e+02)**
MaTP7-T1	3.3788e+03 (4.80e+03) -	2.0367e+03 (4.06e+03) -	2.5497e+03 (4.29e+03) -	5.6680e+03 (6.79e+03) -	2.6303e+02 (2.50e+02) -	1.3869e+03 (3.45e+03) -	1.0721e+04 (3.66e+03) -	5.1285e+01 (2.74e+01) -	3.3564e+02 (1.83e+03) -	8.3296e+02 (2.36e+03) -	**3.8374e-01 (1.25e-01)**
MaTP7-T2	2.0296e+01 (4.08e-02) -	2.0304e+01 (4.05e-02) -	2.0372e+01 (5.20e-02) -	2.0310e+01 (4.76e-02) -	1.7877e+01 (2.49e+00) -	9.5371e+00 (5.88e+00) -	1.8156e+01 (3.61e+00) -	1.0481e+01 (6.23e+00) -	2.0621e+01 (1.47e-01) -	1.5914e+01 (3.26e+00) -	**4.9497e+00 (1.19e+00)**
MaTP7-T3	2.0177e+03 (3.44e+03) -	2.0030e+03 (3.44e+03) -	2.4730e+03 (3.77e+03) -	6.6716e+03 (7.70e+03) -	2.6124e+03 (7.45e+02) -	1.3080e+03 (2.51e+03) -	1.0946e+04 (4.13e+03) -	6.7619e+02 (9.02e+01) -	4.3579e+02 (4.13e+01) -	1.3718e+03 (1.81e+03) -	**3.8118e+02 (1.21e+02)**
MaTP7-T4	1.7022e+03 (3.78e+03) -	2.0340e+03 (4.06e+03) -	2.9259e+03 (5.19e+03) -	4.6680e+03 (8.19e+03) -	5.1231e+02 (6.07e+02) -	7.1736e+02 (2.53e+03) -	1.1432e+04 (5.15e+03) -	5.4288e+01 (2.41e+01) -	1.9438e+00 (3.20e+00) -	1.8054e+03 (3.40e+03) -	**3.7606e-01 (9.59e-02)**
MaTP7-T5	2.0300e+01 (5.03e-02) -	2.0299e+01 (3.95e-02) -	2.0365e+01 (5.15e-02) -	2.0302e+01 (3.68e-02) -	1.7401e+01 (1.90e+00) -	8.2629e+00 (4.86e+00) -	1.8247e+01 (3.30e+00) -	7.8100e+00 (5.20e+00) -	2.0374e+01 (1.58e+00) -	1.4998e+01 (4.33e+00) -	**4.9399e+00 (1.33e+00)**
MaTP7-T6	2.0347e+03 (3.42e+03) -	2.6527e+03 (4.06e+03) -	1.9326e+03 (3.01e+03) -	4.3722e+03 (6.16e+03) -	2.8740e+03 (7.22e+02) -	1.3313e+03 (2.53e+03) -	1.0939e+04 (4.14e+03) -	6.7402e+02 (1.23e+02) -	4.3039e+02 (4.41e+01) -	1.3093e+03 (1.83e+03) -	**3.9403e+02 (1.01e+02)**
MaTP7-T7	3.7013e+03 (7.64e+03) -	1.0367e+03 (3.05e+03) -	2.5998e+03 (5.01e+03) -	3.6681e+03 (5.56e+03) -	3.7473e+02 (4.53e+02) -	1.0790e+03 (3.04e+03) -	1.1370e+04 (5.07e+03) -	4.3114e+01 (1.71e+01) -	1.7679e+00 (2.79e+00) -	2.1095e+03 (4.53e+03) -	**3.8479e-01 (7.87e-02)**
MaTP7-T8	2.0314e+01 (3.97e-02) -	2.0289e+01 (4.60e-02) -	2.0369e+01 (4.53e-02) -	2.0295e+01 (3.36e-02) -	1.8524e+01 (2.04e+00) -	8.0094e+00 (5.17e+00) -	1.8096e+01 (3.46e+00) -	8.3530e+00 (5.20e+00) -	1.9370e+01 (4.33e+00) -	1.4166e+01 (4.10e+00) -	**4.7823e+00 (1.14e+00)**
MaTP7-T9	3.7089e+03 (5.32e+03) -	3.6679e+03 (5.32e+03) -	2.8194e+03 (4.06e+03) -	5.3506e+03 (6.28e+03) -	2.6563e+03 (8.60e+02) -	1.3330e+03 (2.52e+03) -	1.0924e+04 (4.10e+03) -	6.6758e+02 (8.75e+01) -	**4.3657e+02 (4.46e+01) =**	1.9984e+03 (3.05e+03) -	4.3744e+02 (1.34e+02)
MaTP7-T10	2.7085e+03 (4.49e+03) -	1.7046e+03 (4.61e+03) -	2.5784e+03 (5.01e+03) -	5.6680e+03 (6.79e+03) -	4.1821e+02 (2.37e+02) -	7.1984e+02 (2.53e+03) -	1.0704e+04 (4.50e+03) -	4.1440e+01 (1.22e+01) -	1.5916e+00 (1.37e+00) -	2.8884e+03 (4.15e+03) -	**4.8887e-01 (5.67e-01)**
MaTP8-T1	5.4607e+03 (7.66e+03) -	2.6068e+03 (5.02e+03) -	5.0514e+03 (6.61e+03) -	6.2849e+03 (9.59e+03) -	7.4032e+02 (7.61e+02) -	5.1307e+03 (6.22e+03) -	1.5150e+04 (1.08e+04) -	4.8179e+03 (7.14e+03) -	1.5215e+00 (8.35e-01) -	6.0723e+03 (7.73e+03) -	**3.6725e-01 (3.42e-01)**
MaTP8-T2	1.8637e+08 (2.89e+08) -	1.8686e+08 (4.36e+08) -	1.0711e+08 (2.34e+08) -	1.6654e+08 (3.27e+08) =	1.2508e+06 (1.01e+06) -	3.3121e+08 (3.90e+08) -	9.8093e+08 (3.40e+08) -	6.4723e+07 (1.80e+08) -	4.8732e+03 (6.65e+03) -	1.5109e+08 (2.66e+08) -	**1.2067e+03 (1.15e+03)**
MaTP8-T3	1.6887e+01 (1.36e-01) -	1.6916e+01 (1.66e-01) -	1.7014e+01 (1.07e-01) -	1.6732e+01 (8.57e-02) -	1.6396e+01 (5.29e-01) -	1.6637e+01 (1.12e-01) -	1.6775e+01 (7.69e-01) -	1.6596e+01 (4.45e-01) -	1.7015e+01 (8.46e-02) -	1.7023e+01 (8.50e-02) -	**3.2258e+00 (2.55e+00)**
MaTP8-T4	2.6802e+03 (2.13e+03) -	2.1930e+03 (1.96e+03) -	1.9026e+03 (1.45e+03) -	2.9911e+03 (2.10e+03) -	2.7549e+03 (9.39e+02) -	2.2916e+03 (1.75e+03) -	3.9052e+03 (1.64e+03) -	1.5047e+03 (1.31e+03) -	**4.0430e+02 (3.79e+01) =**	2.0087e+03 (1.51e+03) -	4.2596e+02 (1.03e+02)
MaTP8-T5	5.3991e+01 (4.25e+00) -	5.2308e+01 (4.59e+00) -	5.3107e+01 (4.34e+00) -	6.4756e+01 (3.90e+00) -	3.9433e+01 (3.97e+00) -	5.3844e+01 (4.89e+00) -	5.1346e+01 (5.45e+00) -	5.2161e+01 (4.30e+00) -	3.1081e+01 (8.51e+00) =	5.0919e+01 (4.33e+00) -	**3.0599e+01 (4.33e+00)**
MaTP8-T6	3.5659e+03 (5.43e+03) -	2.7596e+03 (5.79e+03) -	3.1031e+03 (4.85e+03) -	4.6279e+03 (6.76e+03) -	6.1998e+02 (6.68e+02) -	4.7770e+03 (5.65e+03) -	1.5251e+04 (6.18e+03) -	2.8550e+03 (6.33e+03) -	1.4970e+00 (1.06e+00) -	4.2125e+03 (4.71e+03) -	**4.6344e-01 (6.02e-01)**
MaTP8-T7	1.6578e+08 (3.62e+08) -	1.4608e+08 (2.69e+08) -	1.6704e+08 (3.23e+08) -	3.5191e+08 (4.52e+08) =	1.7722e+06 (1.86e+06) -	2.8982e+08 (3.90e+08) -	2.5528e+08 (3.83e+08) -	1.2579e+08 (2.52e+08) -	2.7729e+04 (6.32e+04) -	1.0742e+08 (2.35e+08) -	**1.2715e+03 (2.18e+03)**
MaTP8-T8	1.6785e+01 (2.13e-01) -	1.6923e+01 (1.16e-01) -	1.6974e+01 (1.10e-01) -	1.6737e+01 (1.15e-01) -	1.6384e+01 (3.82e-01) -	1.6642e+01 (8.23e-02) -	1.6916e+01 (1.36e-01) -	1.6649e+01 (1.47e-01) -	1.7002e+01 (7.95e-02) -	1.7020e+01 (1.03e-01) -	**2.8247e+00 (9.89e-01)**
MaTP8-T9	2.4536e+03 (1.44e+03) -	1.8416e+03 (1.66e+03) -	2.0424e+03 (1.34e+03) -	3.3742e+03 (2.45e+03) -	2.7749e+03 (6.65e+02) -	2.4364e+03 (1.93e+03) -	5.7157e+03 (5.14e+02) -	1.4806e+03 (1.66e+03) -	**4.1795e+02 (4.80e+01) =**	2.0266e+03 (1.15e+03) -	4.5459e+02 (1.12e+02)
MaTP8-T10	5.3968e+01 (4.60e+00) -	5.2922e+01 (4.82e+00) -	5.2875e+01 (4.20e+00) -	6.2739e+01 (3.98e+00) -	3.8374e+01 (3.25e+00) -	5.4166e+01 (4.82e+00) -	5.3275e+01 (3.66e+00) -	5.1947e+01 (3.72e+00) -	3.0872e+01 (6.10e+00) =	5.1269e+01 (4.68e+00) -	**3.0804e+01 (3.51e+00)**
MaTP9-T1	1.6565e+08 (3.23e+08) -	1.2401e+08 (2.98e+08) -	1.8743e+08 (2.89e+08) -	3.9336e+08 (4.46e+08) -	1.0708e+06 (1.35e+06) -	2.4877e+08 (3.09e+08) -	5.6527e+08 (2.37e+08) -	2.3345e+07 (1.14e+08) -	1.2702e+04 (4.54e+04) =	1.0374e+08 (2.34e+08) -	**1.5583e+03 (1.51e+03)**
MaTP9-T2	1.6815e+01 (1.60e-01) -	1.6899e+01 (1.32e-01) -	1.6933e+01 (1.72e-01) -	1.6757e+01 (1.26e-01) -	1.6533e+01 (1.65e-01) -	1.6632e+01 (9.99e-02) -	1.6921e+01 (1.00e-01) -	1.6678e+01 (9.87e-02) -	1.6986e+01 (5.43e-02) -	1.6939e+01 (1.68e-01) -	**5.2104e+00 (4.86e+00)**
MaTP9-T3	1.9021e+03 (1.41e+03) -	2.5389e+03 (1.82e+03) -	1.7272e+03 (1.29e+03) -	3.2279e+03 (2.29e+03) -	2.8149e+03 (6.71e+02) -	2.2954e+03 (2.27e+03) -	4.9451e+03 (1.88e+03) -	1.2346e+03 (1.16e+03) -	4.1782e+02 (4.12e+01) =	2.0707e+03 (1.18e+03) -	**4.0461e+02 (1.45e+02)**
MaTP9-T4	1.6943e+00 (1.36e+00) -	1.0578e+00 (8.75e-01) -	1.3350e+00 (8.90e-01) -	1.0948e+00 (1.03e+00) -	6.3455e-01 (7.52e-02) -	1.1739e+00 (9.34e-01) -	2.2255e+00 (4.68e-01) -	9.5243e-01 (5.85e-01) -	**1.1974e-02 (5.02e-03) +**	1.3261e+00 (8.64e-01) -	2.0002e-01 (7.87e-02)
MaTP9-T5	5.2733e+01 (4.01e+00) -	5.2372e+01 (4.80e+00) -	5.0525e+01 (3.85e+00) -	6.4132e+01 (4.20e+00) -	3.9358e+01 (3.65e+00) -	5.3407e+01 (4.20e+00) -	5.2131e+01 (4.08e+00) -	5.3189e+01 (3.41e+00) -	**3.0427e+01 (9.39e+00) =**	5.1338e+01 (5.00e+00) -	3.1580e+01 (4.23e+00)
MaTP9-T6	1.2431e+08 (3.01e+08) -	1.4492e+08 (3.13e+08) -	1.0476e+08 (2.35e+08) -	3.0978e+08 (4.52e+08) =	1.7476e+06 (2.38e+06) -	2.0702e+08 (3.39e+08) -	4.3467e+08 (2.89e+08) -	4.1564e+07 (1.58e+08) -	2.5618e+04 (6.35e+04) -	8.5252e+07 (2.09e+08) -	**1.0682e+03 (8.90e+02)**
MaTP9-T7	1.6817e+01 (1.58e-01) -	1.6938e+01 (1.41e-01) -	1.6980e+01 (1.02e-01) -	1.6792e+01 (1.10e-01) -	1.6254e+01 (1.13e+00) -	1.6668e+01 (1.03e-01) -	1.6932e+01 (1.18e-01) -	1.6661e+01 (1.34e-01) -	1.7006e+01 (7.03e-02) -	1.6993e+01 (8.57e-02) -	**3.1819e+00 (2.65e+00)**
MaTP9-T8	1.9625e+03 (1.53e+03) -	1.7876e+03 (1.55e+03) -	2.2132e+03 (1.75e+03) -	3.1933e+03 (2.43e+03) -	2.7901e+03 (7.80e+02) -	2.2280e+03 (1.85e+03) -	4.6558e+03 (2.19e+03) -	1.6908e+03 (1.37e+03) -	**4.0010e+02 (4.06e+01) =**	1.5956e+03 (1.12e+03) -	4.1909e+02 (1.45e+02)
MaTP9-T9	1.2433e+00 (8.08e-01) -	1.2233e+00 (8.97e-01) -	1.7467e+00 (1.01e+00) -	1.4077e+00 (1.10e+00) -	6.8949e-01 (1.32e-01) -	1.5928e+00 (1.14e+00) -	3.5019e+00 (1.88e+00) -	1.1680e+00 (8.54e-01) -	**5.6859e-01 (2.13e-04) +**	1.7926e+00 (1.11e+00) -	5.7542e-01 (3.08e-03)
MaTP9-T10	5.2273e+01 (5.27e+00) -	5.2531e+01 (4.41e+00) -	5.3171e+01 (4.12e+00) -	6.2589e+01 (5.48e+00) -	3.9364e+01 (2.72e+00) -	5.4044e+01 (4.53e+00) -	5.1724e+01 (4.95e+00) -	5.1509e+01 (3.93e+00) -	3.2041e+01 (7.20e+00) =	5.1450e+01 (4.37e+00) -	**2.9916e+01 (3.89e+00)**
MaTP10-T1	3.4935e+03 (5.41e+03) -	4.4087e+03 (6.22e+03) -	3.8489e+03 (5.39e+03) -	5.2843e+03 (5.66e+03) -	9.3863e+02 (1.13e+03) -	7.3819e+03 (9.03e+03) -	1.2533e+04 (7.26e+03) -	3.1983e+03 (6.05e+03) -	1.3430e+00 (7.91e-01) -	5.1076e+03 (6.22e+03) -	**3.9059e-01 (3.60e-01)**
MaTP10-T2	1.6566e+08 (3.23e+08) -	1.6578e+08 (3.23e+08) -	1.1473e+08 (2.35e+08) -	3.2981e+08 (4.80e+08) =	1.4903e+06 (2.48e+06) -	1.8631e+08 (2.89e+08) -	3.0849e+08 (4.20e+08) -	4.1489e+07 (1.58e+08) -	6.8657e+03 (1.43e+04) =	8.0321e+07 (1.91e+08) -	**1.8355e+03 (1.30e+03)**
MaTP10-T3	1.6804e+01 (1.29e-01) -	1.6883e+01 (1.74e-01) -	1.7029e+01 (1.08e-01) -	1.6733e+01 (1.08e-01) -	1.6444e+01 (1.33e-01) -	1.6619e+01 (1.00e-01) -	1.6870e+01 (1.11e-01) -	1.6668e+01 (1.19e-01) -	1.6991e+01 (6.68e-02) -	1.6975e+01 (9.74e-02) -	**6.9720e+00 (6.23e+00)**
MaTP10-T4	2.1374e+03 (1.86e+03) -	2.1475e+03 (1.41e+03) -	2.2011e+03 (1.69e+03) -	3.3996e+03 (2.39e+03) -	2.6568e+03 (6.58e+02) -	3.0770e+03 (2.11e+03) -	3.1703e+03 (1.43e+03) -	1.5744e+03 (1.35e+03) -	**4.0936e+02 (4.86e+01) =**	2.0122e+03 (1.43e+03) -	4.5253e+02 (1.21e+02)
MaTP10-T5	1.4676e+00 (1.33e+00) -	1.4838e+00 (9.57e-01) -	1.6754e+00 (1.09e+00) -	1.1621e+00 (1.13e+00) -	6.7632e-01 (9.87e-02) -	1.5537e+00 (9.80e-01) -	1.7789e+00 (1.16e+00) -	1.4778e+00 (1.02e+00) -	**1.4992e-02 (5.19e-03) +**	1.8322e+00 (1.33e+00) -	2.0280e-01 (1.01e-01)
MaTP10-T6	5.4166e+01 (4.76e+00) -	5.3751e+01 (5.37e+00) -	5.3739e+01 (4.91e+00) -	6.4652e+01 (3.87e+00) -	3.9774e+01 (3.42e+00) -	5.5824e+01 (3.68e+00) -	5.2629e+01 (4.24e+00) -	5.5035e+01 (3.86e+00) -	**2.5484e+01 (6.79e+00) +**	5.2969e+01 (3.64e+00) -	3.1568e+01 (4.42e+00)
MaTP10-T7	3.4444e+03 (6.02e+03) -	2.4318e+03 (4.29e+03) -	4.4950e+03 (5.52e+03) -	8.2634e+03 (7.41e+03) -	8.0159e+02 (1.02e+03) -	5.9675e+03 (6.17e+03) -	1.3019e+04 (5.20e+03) -	8.1445e+02 (2.59e+03) -	1.4507e+00 (1.10e+00) -	4.4875e+03 (6.12e+03) -	**4.5338e-01 (4.36e-01)**
MaTP10-T8	1.4498e+08 (2.67e+08) -	1.0437e+08 (2.37e+08) -	1.4699e+08 (2.66e+08) -	2.0699e+08 (3.77e+08) =	1.8187e+06 (3.77e+06) -	2.2777e+08 (3.45e+08) -	5.1748e+08 (2.35e+08) -	1.8192e+08 (2.83e+08) -	4.1955e+04 (8.65e+04) -	8.7765e+07 (2.14e+08) -	**1.2336e+04 (4.69e+04)**
MaTP10-T9	1.6856e+01 (1.28e-01) -	1.6946e+01 (1.27e-01) -	1.6965e+01 (1.59e-01) -	1.6726e+01 (1.16e-01) -	1.6448e+01 (2.56e-01) -	1.6602e+01 (8.44e-02) -	1.6921e+01 (9.00e-02) -	1.6688e+01 (1.59e-01) -	1.7019e+01 (5.23e-02) -	1.7027e+01 (8.46e-02) -	**2.8281e+00 (8.79e-01)**
MaTP10-T10	1.6958e+03 (1.39e+03) -	2.5397e+03 (1.93e+03) -	1.9649e+03 (1.74e+03) -	2.8861e+03 (1.86e+03) -	2.6679e+03 (7.42e+02) -	2.7565e+03 (2.42e+03) -	6.4205e+03 (2.95e+03) -	1.3418e+03 (1.02e+03) -	**4.0700e+02 (4.07e+01) =**	2.2922e+03 (1.60e+03) -	4.4279e+02 (1.10e+02)
+/-/=	0/100/0	0/100/0	0/100/0	0/93/7	0/100/0	0/100/0	0/100/0	0/100/0	24/60/16	0/100/0	-

TABLE S-IX
AVERAGE HV VALUES ON TEN-TASK CEC19-MATMO BENCHMARK SUITES.

	SPEA2	NSGA-II	NSGA-III	MOEA-D	MOEA-D-DE	MO-MFEA	EMT-ET	EMT-PD	MM-DE	MO-SBO	MTDE-CSO
MaTP1-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3307e-01 (2.83e-02) +**	0 (0) -	3.1638e-01 (1.88e-02)
MaTP1-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.4269e-01 (2.27e-02) +**	0 (0) -	3.1058e-01 (4.03e-02)
MaTP1-T3	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3417e-01 (2.57e-02) +**	0 (0) -	3.1211e-01 (2.12e-02)
MaTP1-T4	0 (0) -	0 (0) -	0 (0) -	1.7848e-04 (9.78e-04) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3805e-01 (1.32e-02) +**	0 (0) -	2.9057e-01 (5.24e-02)
MaTP1-T5	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.2862e-01 (6.49e-02) +**	0 (0) -	3.0277e-01 (3.53e-02)
MaTP1-T6	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3413e-01 (2.07e-02) +**	0 (0) -	3.0722e-01 (2.36e-02)
MaTP1-T7	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3448e-01 (3.78e-02) +**	0 (0) -	3.1838e-01 (4.59e-02)
MaTP1-T8	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3513e-01 (6.13e-02) +**	0 (0) -	3.0405e-01 (3.87e-02)
MaTP1-T9	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3441e-01 (4.66e-02) +**	0 (0) -	3.1810e-01 (1.79e-02)
MaTP1-T10	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.3264e-01 (2.45e-02) +**	0 (0) -	2.8897e-01 (5.60e-02)
MaTP2-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.3677e-02 (6.38e-02)**
MaTP2-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**7.1588e-02 (1.08e-01)**
MaTP2-T3	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.6577e-01 (1.68e-01)**
MaTP2-T4	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**3.0505e-02 (6.97e-02)**
MaTP2-T5	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**9.3803e-02 (1.16e-01)**
MaTP2-T6	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	4.4910e-03 (1.69e-02) -	0 (0) -	**1.2227e-01 (1.23e-01)**
MaTP2-T7	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**7.7556e-02 (1.34e-01)**
MaTP2-T8	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**8.9205e-02 (1.18e-01)**
MaTP2-T9	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**7.9794e-02 (1.45e-01)**
MaTP2-T10	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.0312e-02 (5.34e-02) -	0 (0) -	**1.5815e-01 (1.72e-01)**
MaTP3-T1	2.0059e-03 (7.83e-03) -	3.3257e-03 (5.71e-03) -	3.4635e-06 (1.11e-05) -	2.7538e-02 (6.27e-02) -	2.0115e-02 (4.54e-02) -	1.9556e-04 (2.18e-04) -	9.6878e-04 (3.47e-03) -	1.8167e-03 (1.80e-03) -	**5.9026e-01 (3.75e-03) +**	7.8244e-05 (1.71e-04) -	5.2484e-01 (3.99e-02)
MaTP3-T2	3.0393e-03 (5.97e-03) -	3.1951e-03 (3.15e-03) -	1.7205e-04 (3.18e-04) -	2.8132e-03 (8.68e-03) -	1.6656e-02 (3.02e-02) -	1.3537e-03 (7.07e-04) -	2.5779e-03 (9.08e-03) -	2.8664e-03 (1.73e-03) -	**5.9896e-01 (2.93e-03) +**	1.1798e-04 (2.93e-04) -	5.3546e-01 (2.56e-02)
MaTP3-T3	6.9336e-04 (8.13e-04) -	1.9043e-03 (4.27e-03) -	8.5420e-06 (2.98e-05) -	1.4815e-03 (6.04e-03) -	1.5399e-02 (3.36e-02) -	4.1241e-04 (3.44e-04) -	3.3263e-03 (1.64e-02) -	1.7492e-03 (2.68e-03) -	**5.8867e-01 (1.18e-02) +**	1.6051e-05 (5.59e-05) -	5.3267e-01 (3.14e-02)
MaTP3-T4	2.8774e-04 (1.58e-03) -	7.0462e-05 (3.08e-04) -	0 (0) -	6.5541e-03 (2.44e-02) -	9.5270e-03 (3.36e-02) -	0 (0) -	1.6371e-03 (8.97e-03) -	7.6210e-04 (4.17e-03) -	**5.6480e-01 (3.43e-03) +**	0 (0) -	4.9976e-01 (3.17e-02)
MaTP3-T5	8.1022e-03 (6.16e-03) -	1.1499e-02 (1.16e-02) -	1.8552e-03 (1.81e-03) -	1.3534e-02 (4.50e-02) -	2.3330e-02 (3.77e-02) -	5.8041e-03 (1.40e-03) -	7.1504e-03 (1.68e-02) -	1.1481e-02 (5.03e-03) -	**6.1099e-01 (7.23e-03) +**	2.0477e-03 (1.48e-03) -	5.4994e-01 (3.13e-02)
MaTP3-T6	0 (0) -	0 (0) -	0 (0) -	2.4522e-04 (1.34e-03) -	5.3221e-04 (2.92e-03) -	0 (0) -	0 (0) -	0 (0) -	**3.5307e-01 (5.37e-03) +**	0 (0) -	2.6812e-01 (4.05e-02)
MaTP3-T7	0 (0) -	0 (0) -	0 (0) -	2.5573e-03 (9.82e-03) -	5.6317e-04 (2.42e-03) -	0 (0) -	0 (0) -	0 (0) -	**4.0555e-01 (1.26e-02) +**	0 (0) -	3.2148e-01 (4.03e-02)
MaTP3-T8	5.0186e-05 (1.87e-04) -	6.2571e-04 (2.78e-03) -	0 (0) -	1.4751e-02 (4.64e-02) -	1.5484e-02 (3.58e-02) -	0 (0) -	1.7609e-03 (9.64e-03) -	3.7304e-04 (1.76e-03) -	**5.7693e-01 (6.43e-03) +**	0 (0) -	5.1016e-01 (3.29e-02)
MaTP3-T9	4.3568e-03 (2.09e-03) -	5.8187e-03 (2.93e-03) -	8.6127e-04 (7.15e-04) -	1.7256e-02 (3.53e-02) -	2.3258e-02 (3.18e-02) -	3.1190e-03 (1.23e-03) -	6.2091e-03 (1.80e-02) -	7.0991e-03 (3.83e-03) -	**6.0274e-01 (6.93e-03) +**	7.3610e-04 (7.54e-04) -	5.4893e-01 (2.91e-02)
MaTP3-T10	0 (0) -	0 (0) -	0 (0) -	1.1580e-02 (4.36e-02) -	1.2311e-02 (3.38e-02) -	0 (0) -	1.0874e-04 (5.96e-04) -	0 (0) -	**5.4108e-01 (7.84e-03) +**	0 (0) -	4.5679e-01 (4.49e-02)
MaTP4-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.1523e-02 (2.75e-02) -	0 (0) -	**6.0200e-02 (3.46e-02)**
MaTP4-T2	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	2.7657e-03 (1.51e-02) =	0 (0) =	**6.7761e-03 (2.35e-02)**
MaTP4-T3	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	6.4555e-03 (3.54e-02) -	0 (0) -	**8.7615e-03 (1.97e-02)**
MaTP4-T4	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	7.0696e-03 (2.22e-02) -	0 (0) -	**5.9941e-02 (3.13e-02)**
MaTP4-T5	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.1089e-03 (1.70e-02)**
MaTP4-T6	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.5983e-03 (2.14e-02)**
MaTP4-T7	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	3.8984e-03 (1.24e-02) -	0 (0) -	**6.5182e-02 (3.15e-02)**
MaTP4-T8	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**7.1766e-03 (2.24e-02)**
MaTP4-T9	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.9179e-03 (1.99e-02)**
MaTP4-T10	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	5.5437e-03 (2.11e-02) -	0 (0) -	**6.0914e-02 (3.25e-02)**
MaTP5-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.0185e-02 (2.81e-02)**
MaTP5-T2	0 (0) -	0 (0) -	0 (0) -	2.1379e-03 (9.36e-03) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.0881e-02 (2.06e-02) -	0 (0) -	**7.0214e-02 (1.83e-02)**
MaTP5-T3	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.6409e-03 (1.99e-02) =**	0 (0) =	3.5890e-03 (1.66e-02)
MaTP5-T4	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.0305e-03 (1.66e-02)**
MaTP5-T5	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.6275e-02 (2.14e-02) -	0 (0) -	**5.9510e-02 (2.83e-02)**
MaTP5-T6	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	4.1104e-03 (1.57e-02) -	0 (0) -	**1.8460e-02 (4.04e-02)**
MaTP5-T7	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.1870e-02 (2.49e-02)**
MaTP5-T8	0 (0) -	0 (0) -	0 (0) -	2.2381e-03 (8.85e-03) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.2448e-02 (2.25e-02) -	0 (0) -	**6.5168e-02 (2.18e-02)**
MaTP5-T9	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	1.3540e-03 (7.42e-03) =	0 (0) =	**8.2727e-03 (2.53e-02)**
MaTP5-T10	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**4.4522e-03 (1.74e-02)**
MaTP6-T1	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**1.3688e-02 (7.50e-02) =**	0 (0) =	4.1083e-03 (2.25e-02)
MaTP6-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	2.0191e-02 (3.14e-02) -	0 (0) -	**7.3433e-02 (1.65e-02)**
MaTP6-T3	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.6970e-03 (1.69e-02)**
MaTP6-T4	0 (0) =	0 (0) =	0 (0) =	2.7744e-03 (1.12e-02) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**7.9257e-03 (2.63e-02)**
MaTP6-T5	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.5639e-02 (2.56e-02) -	0 (0) -	**6.3619e-02 (2.39e-02)**
MaTP6-T6	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	5.9907e-03 (2.35e-02) =	0 (0) =	**7.0755e-03 (2.32e-02)**
MaTP6-T7	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.2367e-03 (1.77e-02)**
MaTP6-T8	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.0835e-02 (2.43e-02) -	0 (0) -	**6.8378e-02 (2.31e-02)**
MaTP6-T9	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**7.6587e-03 (2.01e-02)**
MaTP6-T10	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	1.5638e-03 (8.57e-03) =	0 (0) =	**3.1124e-03 (1.70e-02)**
MaTP7-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	6.2020e-03 (2.13e-02) -	0 (0) -	**6.5230e-02 (3.02e-02)**
MaTP7-T2	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.0304e-03 (1.66e-02)**
MaTP7-T3	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.0303e-03 (1.66e-02)**
MaTP7-T4	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	4.4914e-03 (1.81e-02) -	0 (0) -	**6.7056e-02 (2.61e-02)**
MaTP7-T5	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.3881e-03 (1.97e-02)**
MaTP7-T6	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.0303e-03 (1.66e-02)**
MaTP7-T7	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	5.4001e-03 (2.06e-02) -	0 (0) -	**6.2548e-02 (3.01e-02)**
MaTP7-T8	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.9077e-03 (1.68e-02)**
MaTP7-T9	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**4.4557e-03 (1.80e-02)**
MaTP7-T10	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	4.9856e-03 (1.81e-02) -	0 (0) -	**6.7821e-02 (2.92e-02)**
MaTP8-T1	0 (0) -	0 (0) -	0 (0) -	2.7146e-03 (1.49e-02) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.7352e-02 (4.79e-02) -	0 (0) -	**3.7904e-01 (2.84e-01)**
MaTP8-T2	0 (0) =	0 (0) =	0 (0) =	**3.1223e-02 (6.88e-02) +**	0 (0) =	0 (0) =	0 (0) =	0 (0) =	1.0997e-02 (6.02e-02) =	0 (0) =	4.3113e-03 (2.36e-02)
MaTP8-T3	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**2.2580e-01 (1.42e-01)**
MaTP8-T4	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	1.9328e-03 (1.06e-02) =	0 (0) -	**8.2682e-03 (2.47e-02)**
MaTP8-T5	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**4.0117e-03 (2.20e-02) =**	0 (0) =	0 (0)
MaTP8-T6	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	9.8001e-03 (3.50e-02) -	0 (0) -	**3.7652e-01 (2.91e-01)**
MaTP8-T7	0 (0) -	0 (0) -	0 (0) -	7.8001e-03 (2.49e-02) =	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.3308e-02 (3.23e-02)**
MaTP8-T8	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.9557e-01 (1.38e-01)**
MaTP8-T9	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.0526e-03 (2.17e-02)**
MaTP8-T10	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**2.6814e-02 (6.45e-02) +**	0 (0) =	0 (0)
MaTP9-T1	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**6.0034e-03 (3.29e-02)**
MaTP9-T2	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.4469e-01 (1.40e-01)**
MaTP9-T3	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.5218e-02 (4.37e-02)**
MaTP9-T4	9.6424e-02 (1.05e-01) -	1.5322e-01 (9.48e-02) -	8.2457e-02 (7.83e-02) -	2.1448e-01 (1.54e-01) -	1.8334e-01 (4.47e-02) -	1.2613e-01 (8.28e-02) -	7.3675e-03 (4.04e-02) -	1.0307e-01 (5.07e-02) -	**7.5180e-01 (5.74e-03) +**	4.7910e-02 (5.55e-02) -	5.5515e-01 (7.93e-02)
MaTP9-T5	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.3849e-03 (2.35e-02) =**	0 (0) =	0 (0)
MaTP9-T6	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.0381e-03 (2.76e-02) =**	0 (0) =	0 (0)
MaTP9-T7	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**2.0317e-01 (1.29e-01)**
MaTP9-T8	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**1.0801e-02 (3.48e-02)**
MaTP9-T9	3.0230e-01 (2.10e-01) -	3.1887e-01 (2.13e-01) -	1.9577e-01 (1.87e-01) -	3.1101e-01 (1.99e-01) -	4.5595e-01 (7.20e-02) -	2.6308e-01 (2.21e-01) -	1.0773e-01 (2.00e-01) -	3.4041e-01 (1.44e-01) -	**5.2746e-01 (1.85e-04) +**	1.8585e-01 (1.70e-01) -	5.2349e-01 (1.89e-03)
MaTP9-T10	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**5.1851e-03 (2.84e-02) =**	0 (0) =	0 (0)
MaTP10-T1	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	5.1342e-02 (1.35e-01) -	0 (0) -	**3.7136e-01 (2.83e-01)**
MaTP10-T2	0 (0) =	0 (0) =	0 (0) =	**1.7600e-02 (4.66e-02) =**	0 (0) =	0 (0) =	0 (0) =	0 (0) =	1.0261e-02 (5.62e-02) =	0 (0) =	7.1402e-03 (2.73e-02)
MaTP10-T3	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.0931e-01 (1.17e-01)**
MaTP10-T4	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**7.2486e-03 (2.88e-02)**
MaTP10-T5	8.8308e-02 (6.51e-02) -	6.3304e-02 (7.01e-02) -	2.5498e-02 (3.34e-02) -	1.2580e-01 (1.05e-01) -	1.0789e-01 (4.10e-02) -	5.1672e-02 (5.79e-02) -	5.4862e-02 (6.94e-02) -	1.7828e-02 (2.90e-02) -	**7.1595e-01 (6.69e-03) +**	1.0588e-02 (2.47e-02) -	5.0090e-01 (1.09e-01)
MaTP10-T6	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**1.3401e-02 (5.13e-02) =**	0 (0) =	0 (0)
MaTP10-T7	0 (0) -	0 (0) -	0 (0) -	1.5626e-03 (8.56e-03) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	6.8465e-02 (1.73e-01) -	0 (0) -	**3.4381e-01 (3.09e-01)**
MaTP10-T8	0 (0) =	0 (0) =	0 (0) =	**2.7187e-02 (5.95e-02) +**	0 (0) =	0 (0) =	0 (0) =	0 (0) =	1.3880e-02 (5.49e-02) =	0 (0) =	7.1802e-03 (2.74e-02)
MaTP10-T9	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.3292e-01 (1.24e-01)**
MaTP10-T10	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	0 (0) -	**1.1123e-02 (3.39e-02)**
+/-/=	0/66/34	0/66/34	0/66/34	2/65/33	0/66/34	0/66/34	0/66/34	0/66/34	24/42/34	0/66/34	-

TABLE S-X
AVERAGE IGD+ VALUES FOR MTDE WITH ITS COMPONENT VARIANTS ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	w-NSCD	wo-MTDE	wo-CSO	wo-VD	wo-PD	wo-PM	wo-PL	wo-KT	MTDE-CSO
CI-HS-T1	2.3213e-03 (1.21e-04) -	3.2976e+03 (1.02e+03) -	**1.8517e-03 (3.44e-05) =**	1.8790e-03 (5.24e-05) =	1.8782e-03 (6.47e-05) =	1.9070e-03 (5.68e-05) -	1.8953e-03 (6.24e-05) -	2.2344e-03 (1.83e-04) -	1.8647e-03 (3.79e-05)
CI-HS-T2	4.9501e-03 (7.03e-04) -	6.2253e+01 (6.75e+00) -	**4.0631e-03 (3.39e-04) =**	5.0326e-03 (6.96e-04) -	5.4937e-03 (1.30e-03) -	4.8034e-03 (6.68e-04) -	5.1731e-03 (8.31e-04) -	3.3663e-01 (6.81e-03) -	4.1421e-03 (5.26e-04)
CI-MS-T1	3.0070e-03 (1.70e-04) -	1.5574e+01 (1.99e+01) -	2.3881e-03 (4.88e-05) =	2.3828e-03 (7.06e-05) +	**2.3456e-03 (6.33e-05) +**	2.4796e-03 (8.73e-05) -	2.3764e-03 (3.98e-05) +	3.1129e-01 (8.39e-02) -	2.4120e-03 (6.07e-05)
CI-MS-T2	2.6016e-03 (1.03e-04) -	5.8269e-01 (4.39e-01) -	2.1824e-03 (6.99e-05) -	2.0599e-03 (3.17e-05) +	**2.0228e-03 (6.49e-05) +**	2.1599e-03 (9.88e-05) -	2.1137e-03 (5.80e-05) =	2.0467e-03 (1.29e-04) +	2.1168e-03 (5.98e-05)
CI-LS-T1	2.5929e-03 (1.59e-04) -	2.0687e+02 (3.22e+01) -	**2.1141e-03 (6.96e-05) =**	2.3449e-03 (3.44e-04) -	2.3327e-03 (4.29e-04) -	2.3082e-03 (2.51e-04) -	2.2947e-03 (2.38e-04) -	2.1317e+01 (7.53e+00) -	2.1266e-03 (1.20e-04)
CI-LS-T2	3.7976e-03 (2.72e-04) -	3.4750e-01 (7.13e-02) -	2.8842e-03 (7.81e-05) +	2.9470e-03 (9.68e-05) =	**2.8496e-03 (1.09e-04) +**	3.2287e-03 (1.63e-04) -	2.9973e-03 (1.04e-04) =	5.1262e-03 (8.65e-04) -	2.9925e-03 (1.32e-04)
PI-HS-T1	6.4455e-01 (1.21e-01) -	3.5817e+03 (8.23e+02) -	6.6678e-01 (2.24e-04) -	6.6665e-01 (4.19e-07) -	5.5536e-01 (2.51e-01) =	5.5602e-01 (2.52e-01) -	**5.5490e-01 (2.51e-01) +**	6.6665e-01 (4.13e-09) -	5.5601e-01 (2.52e-01)
PI-HS-T2	1.6557e+00 (7.85e-01) =	3.9788e+03 (7.31e+02) -	1.8487e+00 (9.54e-01) =	1.9377e+00 (9.39e-01) -	2.1532e+00 (1.36e+00) =	**1.4743e+00 (9.38e-01) =**	1.7625e+00 (1.03e+00) =	3.2967e+02 (1.38e+02) -	1.7553e+00 (1.13e+00)
PI-MS-T1	**3.7974e-02 (1.32e-02) +**	3.4376e+01 (7.75e+00) -	1.0098e-01 (3.14e-02) -	7.1129e-02 (3.97e-02) =	5.9375e-02 (2.77e-02) =	4.7293e-02 (1.66e-02) +	7.1125e-02 (2.77e-02) =	1.0115e-01 (6.33e-02) -	6.8201e-02 (3.83e-02)
PI-MS-T2	2.1127e+02 (1.03e+02) =	8.8699e+02 (2.38e+02) -	3.1034e+02 (1.26e+02) -	2.4342e+02 (1.13e+02) =	2.0557e+02 (1.03e+02) =	**1.8279e+02 (9.62e+01) =**	2.1475e+02 (1.19e+02) =	2.5334e+02 (1.26e+02) =	2.0661e+02 (1.03e+02)
PI-LS-T1	7.8842e-03 (8.78e-03) =	1.1919e+00 (4.15e-02) -	7.0743e-03 (8.17e-03) =	1.0828e-02 (1.04e-02) =	1.0019e-02 (9.94e-03) =	**6.8171e-03 (5.83e-03) =**	9.4895e-03 (7.36e-03) -	1.2841e-02 (1.48e-02) =	9.4680e-03 (1.29e-02)
PI-LS-T2	**8.4647e+00 (8.68e+00) =**	2.0184e+01 (4.26e-01) -	1.9944e+01 (2.33e-01) =	8.6980e+00 (8.23e+00) =	8.8718e+00 (8.18e+00) =	9.7849e+00 (9.13e+00) =	1.0509e+01 (8.21e+00) =	1.4760e+01 (7.65e+00) =	1.2194e+01 (9.13e+00)
NI-HS-T1	**4.5375e+01 (6.96e-01) =**	1.4245e+07 (9.42e+06) -	4.6206e+01 (5.31e-01) -	4.6077e+01 (5.16e-01) -	4.5746e+01 (6.78e-01) =	4.5576e+01 (5.34e-01) =	4.5921e+01 (6.26e-01) -	1.9041e+02 (2.17e+02) -	4.5530e+01 (4.98e-01)
NI-HS-T2	2.5750e-02 (1.21e-01) -	2.3108e+03 (5.31e+02) -	3.2137e-03 (1.55e-04) -	3.1002e-03 (1.42e-04) -	3.1517e-03 (1.98e-04) -	3.1207e-03 (1.28e-04) -	3.0613e-03 (1.41e-04) -	6.6665e-01 (1.67e-09) -	**2.9727e-03 (1.31e-04)**
NI-MS-T1	1.5246e+01 (1.07e+00) =	1.4939e+04 (6.98e+04) -	1.4626e+01 (1.25e+00) =	1.4999e+01 (1.20e+00) =	1.4970e+01 (1.45e+00) =	1.4954e+01 (1.56e+00) =	**1.4342e+01 (1.89e+00) =**	2.0004e+01 (1.94e+01) =	1.4994e+01 (1.25e+00)
NI-MS-T2	**3.8718e-03 (9.86e-04) =**	3.5031e+01 (1.30e+01) -	9.1805e-03 (2.99e-02) =	3.0989e-02 (6.18e-02) =	2.0475e-02 (4.98e-02) =	1.5932e-02 (4.14e-02) =	5.3210e-02 (7.59e-02) =	3.3450e-01 (1.72e-03) -	1.9324e-02 (4.71e-02)
NI-LS-T1	6.8461e-01 (4.05e-01) -	2.2380e+00 (3.00e-01) -	**4.4502e-02 (1.15e-02) +**	5.6710e-01 (3.71e-01) -	6.6666e-01 (4.30e-01) -	3.4955e-01 (4.03e-01) =	3.4830e-01 (3.79e-01) =	4.6048e-02 (8.01e-03) +	3.6253e-01 (3.95e-01)
NI-LS-T2	1.8224e+01 (5.42e+00) =	1.9125e+01 (8.59e-01) -	1.8979e+01 (1.28e+00) -	2.0038e+01 (4.02e-01) =	**1.7389e+01 (5.97e+00) =**	1.9246e+01 (2.42e+00) -	1.8114e+01 (5.45e+00) =	1.9863e+01 (2.95e+00) -	1.8978e+01 (4.53e+00)
CPLX1-T1	4.2965e-03 (2.63e-04) -	1.0302e+01 (1.21e+01) -	3.6829e-03 (1.57e-04) -	3.5603e-03 (1.63e-04) =	3.6579e-03 (1.70e-04) -	3.6105e-03 (1.68e-04) -	3.5553e-03 (1.26e-04) =	3.5946e-03 (1.51e-04) -	**3.5219e-03 (1.46e-04)**
CPLX1-T2	8.2271e-03 (2.67e-03) -	3.7156e+00 (4.99e+00) -	1.5404e-02 (6.76e-03) -	7.9209e-03 (4.28e-03) =	1.2906e-02 (5.77e-03) -	1.1036e-02 (5.66e-03) -	1.1642e-02 (5.44e-03) -	9.2331e-02 (5.75e-02) -	**7.6296e-03 (3.67e-03)**
CPLX2-T1	4.3257e-03 (1.77e-04) -	2.4690e-01 (1.30e-01) -	3.4815e-03 (1.21e-04) =	**3.4694e-03 (1.32e-04) =**	3.5085e-03 (1.39e-04) =	3.5372e-03 (1.76e-04) =	3.5149e-03 (1.68e-04) =	3.5783e-03 (1.56e-04) =	3.5064e-03 (1.59e-04)
CPLX2-T2	4.6440e-03 (3.47e-04) -	1.1740e+00 (5.76e-01) -	4.8832e-03 (5.02e-04) -	3.7057e-03 (2.52e-04) =	3.6831e-03 (2.57e-04) =	4.5386e-03 (7.71e-04) -	**3.6296e-03 (2.36e-04) =**	4.3464e-03 (6.92e-04) -	3.7129e-03 (2.09e-04)
CPLX3-T1	**4.1837e-02 (1.23e-02) =**	3.5914e-01 (8.23e-02) -	6.5073e-02 (3.78e-02) -	4.7460e-02 (1.93e-02) =	5.5932e-02 (2.78e-02) =	4.9064e-02 (1.89e-02) =	4.4860e-02 (1.94e-02) =	1.4178e-01 (6.05e-02) -	4.7798e-02 (1.87e-02)
CPLX3-T2	**1.8399e-02 (6.17e-03) =**	4.9572e-01 (1.07e-01) -	6.1004e-02 (2.91e-02) -	2.2475e-02 (2.02e-02) =	2.6779e-02 (1.08e-02) -	2.0177e-02 (8.12e-03) =	2.1848e-02 (7.68e-03) =	2.1583e-02 (7.57e-03) =	2.0030e-02 (6.39e-03)
CPLX4-T1	**1.5803e-01 (2.16e-02) +**	2.7115e+02 (7.83e+01) -	1.8700e-01 (1.05e-02) -	1.6610e-01 (1.03e-02) =	1.6795e-01 (1.22e-02) =	1.7519e-01 (9.47e-03) -	1.7395e-01 (1.17e-02) -	1.8469e-01 (1.40e-02) -	1.6248e-01 (1.29e-02)
CPLX4-T2	**2.3502e-01 (1.31e-02) =**	2.8577e+02 (1.04e+02) -	2.6900e-01 (4.48e-03) -	2.4638e-01 (1.21e-02) -	2.4904e-01 (1.54e-02) -	2.5772e-01 (8.62e-03) -	2.5096e-01 (1.22e-02) -	2.6138e-01 (1.45e-02) -	2.3996e-01 (1.13e-02)
CPLX5-T1	9.7252e-03 (1.18e-03) =	1.0647e-01 (1.33e-02) -	2.0758e-02 (4.64e-03) -	9.6812e-03 (1.78e-03) =	1.2454e-02 (2.62e-03) -	1.0205e-02 (1.65e-03) -	1.0231e-02 (1.90e-03) -	1.2121e-02 (2.06e-03) -	**9.2737e-03 (9.93e-04)**
CPLX5-T2	1.0043e-01 (1.54e-02) -	4.8594e-01 (1.79e-01) -	**5.6163e-02 (4.05e-03) =**	6.1810e-02 (1.02e-02) =	6.2759e-02 (8.51e-03) =	6.2910e-02 (1.68e-02) =	5.8296e-02 (8.12e-03) =	5.8803e-02 (8.35e-03) =	6.0569e-02 (1.10e-02)
CPLX6-T1	**6.0339e-02 (4.65e-02) +**	6.3552e+01 (2.15e+01) -	1.5599e-01 (3.77e-02) -	8.6253e-02 (5.29e-02) =	1.1880e-01 (4.24e-02) -	8.7616e-02 (5.75e-02) =	1.1802e-01 (5.05e-02) -	8.9953e-02 (5.00e-02) =	8.7223e-02 (5.15e-02)
CPLX6-T2	**1.4604e-01 (7.60e-02) +**	2.5241e+02 (1.11e+02) -	2.5119e-01 (5.60e-02) -	1.8505e-01 (6.99e-02) =	2.1215e-01 (4.61e-02) =	2.0777e-01 (6.59e-02) -	2.1368e-01 (5.52e-02) =	2.6093e-01 (1.14e-02) -	1.8780e-01 (6.89e-02)
CPLX7-T1	2.0473e-02 (5.15e-03) =	1.7214e+02 (6.02e+01) -	3.7490e-02 (7.14e-03) -	2.1192e-02 (4.86e-03) =	2.4304e-02 (5.69e-03) -	2.4403e-02 (7.66e-03) -	2.1970e-02 (5.06e-03) =	4.9906e-02 (2.72e-02) -	**2.0041e-02 (4.02e-03)**
CPLX7-T2	**1.7130e-02 (1.92e-03) =**	1.6110e+02 (6.58e+01) -	3.0059e-02 (5.36e-03) -	1.9322e-02 (2.56e-03) -	2.1676e-02 (5.10e-03) -	2.1479e-02 (4.81e-03) -	1.8849e-02 (2.87e-03) =	5.8967e-02 (6.25e-02) -	1.7943e-02 (2.32e-03)
CPLX8-T1	**2.0820e-02 (4.72e-03) +**	1.0258e+01 (4.32e+00) -	3.2872e-02 (1.35e-02) -	2.1292e-02 (2.85e-03) =	2.9500e-02 (2.17e-02) -	2.3787e-02 (8.39e-03) =	2.3432e-02 (5.20e-03) =	2.7626e-02 (8.83e-03) -	2.2879e-02 (3.53e-03)
CPLX8-T2	5.8511e-03 (7.55e-04) -	3.6785e+00 (3.58e+00) -	2.0335e-02 (1.15e-02) -	4.4783e-03 (5.11e-04) =	**4.1036e-03 (5.43e-04) +**	5.7697e-03 (1.58e-03) -	4.5812e-03 (6.52e-04) =	5.1594e-03 (1.64e-03) =	4.5801e-03 (5.39e-04)
CPLX9-T1	3.1313e-01 (1.72e-01) -	9.2168e+02 (9.02e+02) -	1.6468e-01 (4.49e-01) =	3.6036e-01 (6.83e-01) -	1.2043e+00 (2.86e+00) -	8.8287e-01 (2.51e+00) =	**9.0413e-02 (1.18e-01) +**	7.1391e-01 (2.05e+00) -	1.1698e-01 (9.99e-02)
CPLX9-T2	**6.0336e-02 (7.59e-03) +**	1.7714e+02 (5.36e+01) -	7.2268e-02 (1.27e-02) -	6.5782e-02 (7.85e-03) =	1.0923e-01 (7.10e-02) -	8.8885e-02 (6.17e-02) -	6.9013e-02 (1.73e-02) =	2.5847e-01 (2.03e-02) -	6.6682e-02 (7.98e-03)
CPLX10-T1	4.2875e-03 (2.17e-04) -	2.7512e-01 (1.24e-01) -	3.0060e-02 (1.62e-02) -	3.5546e-03 (3.16e-04) =	3.4544e-03 (1.37e-04) =	3.7523e-03 (5.33e-04) -	**3.4382e-03 (1.83e-04) =**	3.5739e-03 (2.01e-04) -	3.4783e-03 (2.18e-04)
CPLX10-T2	1.0917e-01 (4.10e-02) =	5.3840e-01 (3.18e-01) -	1.3906e-01 (2.06e-02) -	1.2446e-01 (3.36e-02) =	1.1697e-01 (3.11e-02) =	**1.0834e-01 (2.83e-02) =**	1.1130e-01 (2.34e-02) =	1.1596e-01 (3.07e-02) =	1.1865e-01 (3.66e-02)
+/-/=	6/17/15	0/38/0	2/24/12	2/10/26	4/15/19	1/21/16	3/11/24	2/26/10	-

TABLE S-XI
AVERAGE HV VALUES FOR MTDE WITH ITS COMPONENT VARIANTS ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	w-NSCD	wo-MTDE	wo-CSO	wo-VD	wo-PD	wo-PM	wo-PL	wo-KT	MTDE-CSO
CI-HS-T1	3.4656e-01 (2.67e-04) -	0 (0) -	**3.4740e-01 (6.82e-05) =**	3.4736e-01 (9.83e-05) =	3.4737e-01 (1.10e-04) =	3.4732e-01 (1.00e-04) -	3.4733e-01 (1.05e-04) -	3.4680e-01 (2.85e-04) -	3.4738e-01 (7.17e-05)
CI-HS-T2	4.4048e-01 (1.19e-03) -	0 (0) -	**4.4201e-01 (5.72e-04) =**	4.4034e-01 (1.13e-03) -	4.3963e-01 (2.09e-03) -	4.4074e-01 (1.09e-03) -	4.4012e-01 (1.37e-03) -	8.7933e-02 (6.20e-03) -	4.4183e-01 (8.95e-04)
CI-MS-T1	4.4387e-01 (2.73e-04) -	3.8966e-03 (1.69e-02) -	4.4489e-01 (7.96e-05) =	4.4491e-01 (1.00e-04) =	**4.4497e-01 (1.02e-04) +**	4.4473e-01 (1.45e-04) -	4.4492e-01 (6.37e-05) +	1.1450e-01 (8.98e-02) -	4.4487e-01 (9.19e-05)
CI-MS-T2	3.4615e-01 (1.99e-04) -	4.8842e-02 (7.83e-02) -	3.4687e-01 (1.31e-04) -	3.4709e-01 (5.69e-05) +	**3.4715e-01 (1.12e-04) +**	3.4693e-01 (1.55e-04) -	3.4700e-01 (9.92e-05) =	3.4712e-01 (2.07e-04) +	3.4699e-01 (1.05e-04)
CI-LS-T1	3.4617e-01 (3.14e-04) -	0 (0) -	**3.4704e-01 (1.19e-04) =**	3.4668e-01 (5.28e-04) -	3.4671e-01 (6.53e-04) -	3.4673e-01 (3.92e-04) -	3.4676e-01 (3.66e-04) -	0 (0) -	3.4702e-01 (1.99e-04)
CI-LS-T2	7.1916e-01 (4.21e-04) -	3.3050e-01 (6.25e-02) -	7.2064e-01 (1.19e-04) +	7.2053e-01 (1.47e-04) =	**7.2068e-01 (1.77e-04) +**	7.2010e-01 (2.46e-04) -	7.2044e-01 (1.57e-04) =	7.1715e-01 (1.27e-03) -	7.2047e-01 (1.99e-04)
PI-HS-T1	1.1184e-01 (1.15e-01) -	0 (0) -	9.0792e-02 (2.04e-04) -	9.0909e-02 (3.81e-07) -	1.9636e-01 (2.38e-01) =	1.9575e-01 (2.38e-01) -	**1.9677e-01 (2.38e-01) +**	9.0909e-02 (3.75e-09) -	1.9578e-01 (2.38e-01)
PI-HS-T2	2.4237e-02 (4.09e-02) =	0 (0) -	2.4428e-02 (3.87e-02) =	1.5146e-02 (3.44e-02) =	9.2717e-02 (2.17e-01) =	**9.7825e-02 (2.15e-01) =**	3.5433e-02 (5.91e-02) =	0 (0) -	7.7854e-02 (1.82e-01)
PI-MS-T1	**3.1927e-01 (1.76e-02) +**	0 (0) -	2.3581e-01 (3.97e-02) -	2.7687e-01 (4.83e-02) =	2.9110e-01 (3.70e-02) =	3.0734e-01 (2.22e-02) +	2.7511e-01 (3.76e-02) =	2.4152e-01 (7.02e-02) -	2.8038e-01 (4.66e-02)
PI-MS-T2	1.4377e-02 (3.28e-02) =	0 (0) -	0 (0) -	1.1609e-02 (3.01e-02) =	1.6535e-02 (3.37e-02) =	**2.6230e-02 (4.08e-02) =**	1.6806e-02 (3.43e-02) =	1.3199e-02 (3.05e-02) =	1.4683e-02 (3.30e-02)
PI-LS-T1	3.3912e-01 (1.23e-02) =	0 (0) -	3.4045e-01 (1.14e-02) =	3.3518e-01 (1.43e-02) =	3.3631e-01 (1.38e-02) =	**3.4072e-01 (8.22e-03) =**	3.3696e-01 (1.03e-02) -	3.3245e-01 (2.04e-02) =	3.3712e-01 (1.78e-02)
PI-LS-T2	**4.1302e-02 (9.43e-02) =**	0 (0) -	0 (0) -	7.9464e-03 (2.39e-02) =	1.0332e-02 (3.93e-02) =	3.4004e-02 (8.34e-02) =	2.3697e-03 (1.03e-02) -	0 (0) -	1.0924e-02 (2.23e-02)
NI-HS-T1	5.1073e-02 (1.21e-02) =	0 (0) -	4.3776e-02 (6.13e-03) -	4.5469e-02 (5.98e-03) -	4.9790e-02 (8.33e-03) =	5.1712e-02 (6.72e-03) =	4.7527e-02 (7.46e-03) -	1.4310e-02 (6.38e-02) -	**5.2244e-02 (6.28e-03)**
NI-HS-T2	6.9778e-01 (1.15e-01) -	0 (0) -	7.1942e-01 (2.33e-04) -	7.1960e-01 (2.19e-04) -	7.1949e-01 (3.13e-04) -	7.1956e-01 (2.13e-04) -	7.1965e-01 (2.23e-04) -	9.0909e-02 (1.52e-09) -	**7.1979e-01 (2.10e-04)**
NI-MS-T1	8.9610e-01 (1.73e-02) =	0 (0) -	**9.0641e-01 (1.88e-02) +**	8.9195e-01 (1.98e-02) =	8.9733e-01 (1.84e-02) =	8.9767e-01 (2.17e-02) =	8.9565e-01 (2.42e-02) =	8.2453e-01 (2.52e-01) =	8.9686e-01 (1.35e-02)
NI-MS-T2	**4.4229e-01 (1.72e-03) =**	0 (0) -	4.3615e-01 (3.56e-02) =	4.1014e-01 (7.33e-02) =	4.2251e-01 (5.91e-02) =	4.2757e-01 (4.90e-02) =	3.8366e-01 (8.99e-02) =	8.9865e-02 (1.57e-03) -	4.2376e-01 (5.63e-02)
NI-LS-T1	3.7004e-01 (2.40e-01) -	7.5155e-06 (4.12e-05) -	**7.8562e-01 (8.50e-03) +**	4.1990e-01 (2.28e-01) -	3.7790e-01 (2.59e-01) -	5.8261e-01 (2.49e-01) =	5.7659e-01 (2.36e-01) =	7.8387e-01 (6.53e-03) +	5.6939e-01 (2.47e-01)
NI-LS-T2	0 (0) =	0 (0) =	0 (0) =	0 (0) =	**3.5961e-03 (1.97e-02) =**	0 (0) =	0 (0) =	0 (0) =	0 (0)
CPLX1-T1	7.1988e-01 (3.60e-04) -	5.2669e-02 (1.12e-01) -	7.2086e-01 (2.20e-04) -	7.2104e-01 (2.38e-04) =	7.2088e-01 (2.58e-04) -	7.2095e-01 (2.43e-04) -	7.2103e-01 (1.85e-04) =	7.2099e-01 (2.19e-04) =	**7.2110e-01 (1.98e-04)**
CPLX1-T2	7.1258e-01 (4.73e-03) =	7.2675e-02 (1.34e-01) -	7.0077e-01 (1.09e-02) -	7.1269e-01 (7.15e-03) =	7.0445e-01 (9.35e-03) -	7.0775e-01 (9.10e-03) -	7.0481e-01 (1.21e-02) -	5.6080e-01 (9.87e-02) -	**7.1279e-01 (7.57e-03)**
CPLX2-T1	7.2158e-01 (2.75e-04) -	3.7785e-01 (1.40e-01) -	7.2286e-01 (1.88e-04) =	**7.2290e-01 (2.01e-04) =**	7.2283e-01 (1.80e-04) =	7.2278e-01 (2.44e-04) =	7.2282e-01 (2.50e-04) =	7.2272e-01 (2.16e-04) -	7.2285e-01 (2.30e-04)
CPLX2-T2	7.1266e-01 (8.07e-04) -	4.9527e-02 (9.51e-02) -	7.0909e-01 (2.20e-03) -	7.1383e-01 (9.96e-04) =	**7.1400e-01 (9.73e-04) +**	7.1232e-01 (1.76e-03) -	7.1368e-01 (9.27e-04) =	7.0867e-01 (3.43e-03) -	7.1357e-01 (9.12e-04)
CPLX3-T1	**6.4373e-01 (2.14e-02) =**	2.7602e-01 (6.00e-02) -	6.0327e-01 (5.95e-02) -	6.3428e-01 (3.46e-02) =	6.2202e-01 (4.55e-02) =	6.3264e-01 (3.26e-02) =	6.4106e-01 (3.40e-02) =	4.9563e-01 (8.23e-02) -	6.3303e-01 (3.26e-02)
CPLX3-T2	**7.4058e-01 (1.09e-02) =**	2.3050e-01 (7.08e-02) -	6.7318e-01 (5.54e-02) -	7.3151e-01 (3.92e-02) =	7.2695e-01 (1.96e-02) -	7.3600e-01 (1.24e-02) =	7.3569e-01 (1.24e-02) =	7.3653e-01 (1.31e-02) =	7.3692e-01 (1.13e-02)
CPLX4-T1	**4.8764e-01 (5.95e-02) =**	0 (0) -	4.4240e-01 (4.85e-02) -	4.7841e-01 (3.73e-02) =	4.8427e-01 (4.48e-02) =	4.6660e-01 (3.96e-02) =	4.5617e-01 (4.38e-02) -	4.5269e-01 (6.03e-02) =	4.8170e-01 (4.61e-02)
CPLX4-T2	**6.5693e-01 (7.35e-03) =**	0 (0) -	6.3381e-01 (3.20e-03) -	6.5012e-01 (5.81e-03) -	6.5175e-01 (7.72e-03) =	6.4715e-01 (5.25e-03) -	6.4889e-01 (7.21e-03) -	6.4132e-01 (8.50e-03) -	6.5428e-01 (6.84e-03)
CPLX5-T1	7.2160e-01 (2.87e-03) =	6.0626e-01 (1.34e-02) -	7.0554e-01 (6.72e-03) -	7.2194e-01 (3.71e-03) =	7.1832e-01 (4.73e-03) -	7.2107e-01 (2.10e-03) -	7.2113e-01 (3.40e-03) -	7.1911e-01 (3.18e-03) -	**7.2275e-01 (1.77e-03)**
CPLX5-T2	9.9015e-01 (1.85e-03) -	9.2010e-01 (3.81e-02) -	**9.9209e-01 (4.72e-04) =**	9.9190e-01 (6.38e-04) =	9.9198e-01 (3.82e-04) =	9.9193e-01 (8.37e-04) =	9.9196e-01 (5.16e-04) =	9.9204e-01 (4.58e-04) =	9.9204e-01 (5.97e-04)
CPLX6-T1	**6.3500e-01 (8.62e-02) +**	0 (0) -	4.7960e-01 (6.42e-02) -	5.8800e-01 (9.73e-02) =	5.3161e-01 (7.73e-02) -	5.9373e-01 (1.03e-01) =	5.3539e-01 (9.00e-02) -	5.8666e-01 (9.04e-02) =	5.8897e-01 (9.43e-02)
CPLX6-T2	**2.8636e-01 (5.67e-02) +**	0 (0) -	2.0813e-01 (4.61e-02) -	2.5509e-01 (4.62e-02) =	2.4086e-01 (3.31e-02) =	2.3496e-01 (4.83e-02) -	2.4502e-01 (4.00e-02) =	2.0449e-01 (1.67e-02) -	2.5721e-01 (4.62e-02)
CPLX7-T1	**7.3192e-01 (9.79e-03) =**	0 (0) -	7.0031e-01 (1.15e-02) -	7.3031e-01 (9.38e-03) =	7.2463e-01 (1.06e-02) -	7.2429e-01 (1.33e-02) =	7.2785e-01 (9.16e-03) =	6.8024e-01 (5.26e-02) -	7.3051e-01 (9.16e-03)
CPLX7-T2	**7.3545e-01 (5.28e-03) +**	0 (0) -	7.1485e-01 (8.55e-03) -	7.3017e-01 (5.71e-03) =	7.2714e-01 (8.30e-03) -	7.2712e-01 (7.92e-03) -	7.3100e-01 (6.18e-03) =	6.6680e-01 (1.00e-01) -	7.3228e-01 (6.24e-03)
CPLX8-T1	**7.0365e-01 (6.76e-03) +**	0 (0) -	6.8436e-01 (2.69e-02) -	7.0265e-01 (4.82e-03) +	6.8971e-01 (3.91e-02) =	6.9848e-01 (1.16e-02) =	6.9990e-01 (7.34e-03) =	6.9378e-01 (1.23e-02) =	6.9978e-01 (5.27e-03)
CPLX8-T2	7.9637e-01 (1.96e-03) =	1.4919e-02 (4.17e-02) -	7.5363e-01 (1.94e-02) -	7.9632e-01 (1.81e-03) =	**7.9648e-01 (2.27e-03) =**	7.9259e-01 (3.84e-03) -	7.9486e-01 (3.12e-03) =	7.9256e-01 (5.07e-03) -	7.9569e-01 (2.18e-03)
CPLX9-T1	**9.9999e-01 (2.54e-05) =**	2.7119e-01 (3.84e-01) -	9.9906e-01 (4.77e-03) =	9.9757e-01 (7.42e-03) -	9.9275e-01 (1.43e-02) -	9.9626e-01 (1.29e-02) -	9.9995e-01 (2.27e-04) =	9.9402e-01 (1.93e-02) -	9.9997e-01 (8.52e-05)
CPLX9-T2	**3.4874e-01 (1.14e-02) +**	0 (0) -	3.3061e-01 (1.60e-02) -	3.3940e-01 (1.04e-02) =	3.0415e-01 (5.58e-02) -	3.2191e-01 (4.66e-02) -	3.3876e-01 (1.63e-02) =	2.0230e-01 (2.34e-02) -	3.4082e-01 (1.09e-02)
CPLX10-T1	7.5781e-01 (2.14e-03) =	4.3734e-01 (1.35e-01) -	7.2221e-01 (1.27e-02) -	7.5698e-01 (3.22e-03) =	**7.5862e-01 (1.86e-03) =**	7.5683e-01 (2.80e-03) =	7.5834e-01 (1.84e-03) =	7.5616e-01 (2.72e-03) -	7.5780e-01 (2.56e-03)
CPLX10-T2	**5.3308e-01 (4.27e-02) =**	1.7695e-01 (1.20e-01) -	4.8850e-01 (2.65e-02) -	5.0727e-01 (4.40e-02) =	5.2157e-01 (3.86e-02) =	5.2813e-01 (3.67e-02) =	5.2142e-01 (3.32e-02) =	5.1810e-01 (3.95e-02) =	5.1775e-01 (4.45e-02)
+/-/=	6/13/19	0/37/1	3/24/11	2/8/28	4/13/21	1/18/19	2/12/24	2/25/11	-

TABLE S-XII
AVERAGE IGD+ FOR EACH PARAMETER α SETTINGS IN MTDE-CSO ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	$\alpha = 0$	$\alpha = 0.1$	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$
CI-HS-T1	2.3401e-03 (3.51e-04)	1.8900e-03 (5.00e-05)	1.8803e-03 (6.56e-05)	1.8647e-03 (3.79e-05)	1.8634e-03 (3.77e-05)	**1.8591e-03 (3.72e-05)**
CI-HS-T2	3.3520e-01 (4.98e-03)	**3.9160e-03 (4.43e-04)**	4.0956e-03 (4.86e-04)	4.1421e-03 (5.26e-04)	4.4325e-03 (5.64e-04)	4.6167e-03 (4.93e-04)
CI-MS-T1	3.1129e-01 (8.40e-02)	2.4116e-03 (5.73e-05)	2.4168e-03 (5.79e-05)	2.4120e-03 (6.07e-05)	2.3975e-03 (6.23e-05)	**2.3743e-03 (4.16e-05)**
CI-MS-T2	**2.0411e-03 (1.18e-04)**	2.0681e-03 (7.16e-05)	2.1059e-03 (6.88e-05)	2.1168e-03 (5.98e-05)	2.1522e-03 (8.29e-05)	2.1525e-03 (6.38e-05)
CI-LS-T1	2.1647e+01 (7.19e+00)	**2.0981e-03 (1.07e-04)**	2.1322e-03 (1.19e-04)	2.1266e-03 (1.20e-04)	2.1242e-03 (1.15e-04)	2.2091e-03 (1.96e-04)
CI-LS-T2	5.0227e-03 (9.00e-04)	3.1635e-03 (1.45e-04)	3.0670e-03 (1.37e-04)	2.9925e-03 (1.32e-04)	2.9445e-03 (1.24e-04)	**2.9408e-03 (9.73e-05)**
PI-HS-T1	6.6665e-01 (4.37e-10)	**3.7900e-01 (3.35e-01)**	5.1175e-01 (2.86e-01)	5.5601e-01 (2.52e-01)	5.1176e-01 (2.86e-01)	6.0029e-01 (2.03e-01)
PI-HS-T2	3.5710e+02 (1.83e+02)	1.3059e+00 (1.11e+00)	**1.0827e+00 (8.24e-01)**	1.7553e+00 (1.13e+00)	1.6643e+00 (1.01e+00)	1.2931e+00 (8.33e-01)
PI-MS-T1	1.0765e-01 (6.49e-02)	4.5889e-02 (2.57e-02)	**4.5801e-02 (2.41e-02)**	6.8201e-02 (3.83e-02)	6.4563e-02 (2.90e-02)	5.9622e-02 (3.15e-02)
PI-MS-T2	2.1886e+02 (1.21e+02)	2.0866e+02 (1.18e+02)	2.3957e+02 (9.81e+01)	2.0661e+02 (1.03e+02)	**1.8672e+02 (1.20e+02)**	2.0161e+02 (9.58e+01)
PI-LS-T1	8.4847e-03 (1.17e-02)	1.1356e-02 (1.35e-02)	8.0788e-03 (7.38e-03)	9.4680e-03 (1.29e-02)	9.7512e-03 (9.96e-03)	**7.3642e-03 (7.10e-03)**
PI-LS-T2	1.3525e+01 (8.17e+00)	1.1378e+01 (8.81e+00)	1.2776e+01 (8.48e+00)	1.2194e+01 (9.13e+00)	9.7186e+00 (9.02e+00)	**8.4401e+00 (8.94e+00)**
NI-HS-T1	1.5366e+02 (8.61e+01)	**4.5147e+01 (5.28e-01)**	4.5370e+01 (7.92e-01)	4.5530e+01 (4.98e-01)	4.5409e+01 (9.40e-01)	4.5748e+01 (6.08e-01)
NI-HS-T2	6.6665e-01 (2.69e-10)	**2.9590e-03 (1.42e-04)**	2.9791e-03 (1.35e-04)	2.9727e-03 (1.31e-04)	3.0574e-03 (1.62e-04)	3.1400e-03 (1.67e-04)
NI-MS-T1	1.9870e+01 (1.94e+01)	**1.4076e+01 (1.98e+00)**	1.4718e+01 (1.89e+00)	1.4994e+01 (1.25e+00)	1.4523e+01 (2.09e+00)	1.6846e+01 (1.23e+01)
NI-MS-T2	3.3415e-01 (8.53e-04)	3.6551e-02 (6.64e-02)	**1.4720e-02 (4.16e-02)**	1.9324e-02 (4.71e-02)	4.2099e-02 (7.05e-02)	5.8898e-02 (7.80e-02)
NI-LS-T1	**4.4326e-02 (5.68e-03)**	5.4109e-02 (1.31e-02)	1.1489e-01 (1.83e-01)	3.6253e-01 (3.95e-01)	6.1163e-01 (4.17e-01)	8.1966e-01 (3.36e-01)
NI-LS-T2	2.0336e+01 (2.68e-01)	1.9182e+01 (4.27e+00)	1.8907e+01 (4.43e+00)	1.8978e+01 (4.53e+00)	1.8790e+01 (4.51e+00)	**1.8105e+01 (5.81e+00)**
CPLX1-T1	3.5826e-03 (1.36e-04)	3.5762e-03 (1.40e-04)	3.5889e-03 (1.42e-04)	**3.5219e-03 (1.46e-04)**	3.5308e-03 (1.24e-04)	3.5304e-03 (1.81e-04)
CPLX1-T2	7.4025e-02 (5.49e-02)	1.1073e-02 (5.73e-03)	8.3314e-03 (3.41e-03)	**7.6296e-03 (3.67e-03)**	8.6702e-03 (5.12e-03)	8.3798e-03 (3.16e-03)
CPLX2-T1	3.5864e-03 (1.41e-04)	3.5798e-03 (1.42e-04)	3.5233e-03 (1.25e-04)	3.5064e-03 (1.59e-04)	3.5297e-03 (1.07e-04)	**3.4856e-03 (1.17e-04)**
CPLX2-T2	4.2552e-03 (7.81e-04)	3.7158e-03 (2.38e-04)	3.6912e-03 (2.07e-04)	3.7129e-03 (2.09e-04)	**3.6045e-03 (2.45e-04)**	3.6333e-03 (2.21e-04)
CPLX3-T1	1.2193e-01 (6.04e-02)	5.5789e-02 (2.75e-02)	4.5173e-02 (2.06e-02)	4.7798e-02 (1.87e-02)	**4.4301e-02 (8.40e-03)**	5.3900e-02 (2.33e-02)
CPLX3-T2	2.4005e-02 (1.16e-02)	**1.8754e-02 (5.88e-03)**	1.8863e-02 (7.25e-03)	2.0030e-02 (6.39e-03)	1.8980e-02 (4.93e-03)	2.1243e-02 (7.36e-03)
CPLX4-T1	1.8292e-01 (1.82e-02)	1.6388e-01 (1.53e-02)	1.6545e-01 (1.32e-02)	**1.6248e-01 (1.29e-02)**	1.6343e-01 (1.49e-02)	1.6380e-01 (1.14e-02)
CPLX4-T2	2.5910e-01 (1.45e-02)	**2.3867e-01 (1.01e-02)**	2.4161e-01 (8.60e-03)	2.3996e-01 (1.13e-02)	2.4135e-01 (1.64e-02)	2.4274e-01 (1.32e-02)
CPLX5-T1	1.2340e-02 (2.53e-03)	1.0386e-02 (1.95e-03)	1.0301e-02 (2.01e-03)	9.2737e-03 (9.93e-04)	9.8034e-03 (1.25e-03)	**9.1917e-03 (1.33e-03)**
CPLX5-T2	6.1077e-02 (8.16e-03)	5.9883e-02 (8.32e-03)	**5.9362e-02 (8.39e-03)**	6.0569e-02 (1.10e-02)	5.9633e-02 (9.64e-03)	6.1822e-02 (8.75e-03)
CPLX6-T1	8.8169e-02 (5.80e-02)	**6.5939e-02 (5.52e-02)**	8.2277e-02 (5.81e-02)	8.7223e-02 (5.15e-02)	9.7513e-02 (4.60e-02)	1.0574e-01 (4.97e-02)
CPLX6-T2	2.6445e-01 (1.13e-02)	1.9276e-01 (7.29e-02)	**1.6244e-01 (8.03e-02)**	1.8780e-01 (6.89e-02)	2.0104e-01 (6.49e-02)	2.0916e-01 (5.56e-02)
CPLX7-T1	4.7694e-02 (2.81e-02)	2.0596e-02 (4.77e-03)	2.1871e-02 (5.78e-03)	**2.0041e-02 (4.02e-03)**	2.2566e-02 (6.64e-03)	2.0796e-02 (3.99e-03)
CPLX7-T2	9.4944e-02 (7.28e-02)	1.8953e-02 (3.32e-03)	1.8877e-02 (4.26e-03)	**1.7943e-02 (2.32e-03)**	1.9309e-02 (4.20e-03)	1.8663e-02 (3.90e-03)
CPLX8-T1	5.4056e-02 (7.66e-02)	2.3158e-02 (6.58e-03)	2.2654e-02 (5.54e-03)	2.2879e-02 (3.53e-03)	**2.1485e-02 (4.17e-03)**	2.1821e-02 (3.19e-03)
CPLX8-T2	4.8554e-03 (8.13e-04)	4.5857e-03 (6.56e-04)	4.6143e-03 (8.63e-04)	4.5801e-03 (5.39e-04)	**4.4153e-03 (4.99e-04)**	4.6675e-03 (5.89e-04)
CPLX9-T1	2.1396e-01 (2.65e-01)	2.7867e-01 (6.03e-01)	2.5662e-01 (7.63e-01)	**1.1698e-01 (9.99e-02)**	4.8439e-01 (1.20e+00)	1.1330e+00 (4.81e+00)
CPLX9-T2	2.6455e-01 (1.97e-02)	1.0866e-01 (8.00e-02)	7.6336e-02 (4.80e-02)	6.6682e-02 (7.98e-03)	**6.5554e-02 (8.62e-03)**	6.8182e-02 (6.80e-03)
CPLX10-T1	3.5966e-03 (2.18e-04)	3.5008e-03 (2.62e-04)	3.5540e-03 (2.49e-04)	3.4783e-03 (2.18e-04)	3.4669e-03 (2.25e-04)	**3.4118e-03 (1.97e-04)**
CPLX10-T2	**1.0765e-01 (3.22e-02)**	1.1613e-01 (3.32e-02)	1.1396e-01 (3.37e-02)	1.1865e-01 (3.66e-02)	1.2749e-01 (1.90e-02)	1.3928e-01 (1.89e-02)

TABLE S-XIII
AVERAGE HV FOR EACH PARAMETER α SETTINGS IN MTDE-CSO ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

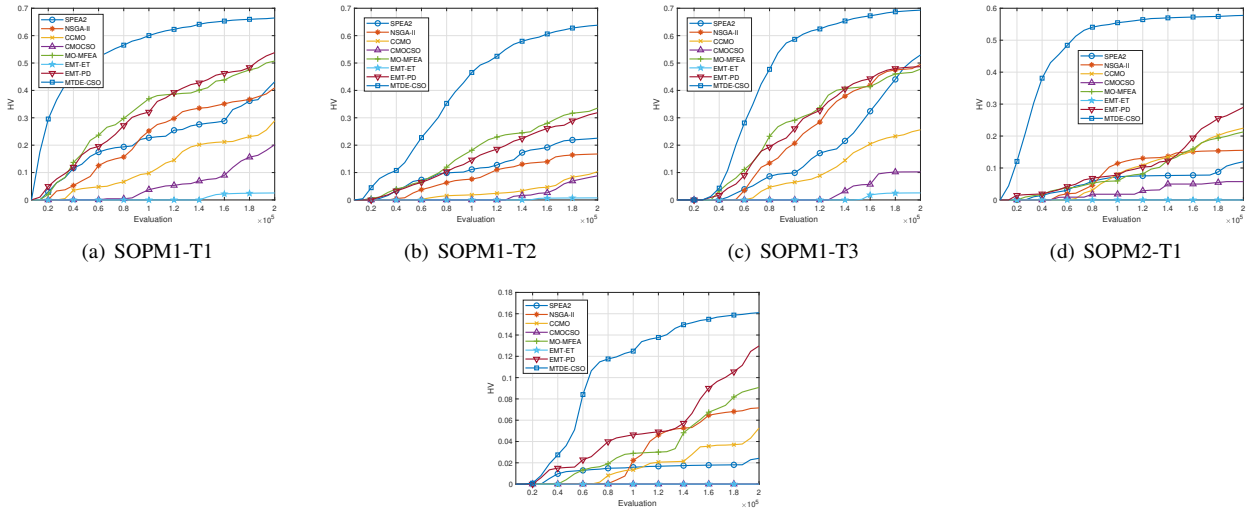
	$\alpha = 0$	$\alpha = 0.1$	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$
CI-HS-T1	3.4664e-01 (5.45e-04)	3.4734e-01 (9.70e-05)	3.4737e-01 (1.14e-04)	3.4738e-01 (7.17e-05)	3.4739e-01 (6.65e-05)	**3.4739e-01 (6.83e-05)**
CI-HS-T2	8.9227e-02 (4.53e-03)	**4.4221e-01 (7.59e-04)**	4.4192e-01 (8.10e-04)	4.4183e-01 (8.95e-04)	4.4136e-01 (9.46e-04)	4.4105e-01 (8.14e-04)
CI-MS-T1	1.1451e-01 (8.98e-02)	4.4486e-01 (1.02e-04)	4.4485e-01 (9.98e-05)	4.4487e-01 (9.19e-05)	4.4488e-01 (9.59e-05)	**4.4492e-01 (6.29e-05)**
CI-MS-T2	**3.4715e-01 (1.97e-04)**	3.4710e-01 (1.24e-04)	3.4703e-01 (1.27e-04)	3.4701e-01 (1.05e-04)	3.4696e-01 (1.38e-04)	3.4695e-01 (1.16e-04)
CI-LS-T1	0 (0)	**3.4707e-01 (1.75e-04)**	3.4701e-01 (1.89e-04)	3.4702e-01 (1.99e-04)	3.4703e-01 (1.89e-04)	3.4689e-01 (3.11e-04)
CI-LS-T2	7.1708e-01 (1.35e-03)	7.1998e-01 (2.16e-04)	7.2012e-01 (2.09e-04)	7.2024e-01 (1.99e-04)	7.2032e-01 (1.86e-04)	**7.2033e-01 (1.47e-04)**
PI-HS-T1	9.0909e-02 (3.98e-10)	**3.6352e-01 (3.17e-01)**	2.3772e-01 (2.71e-01)	1.9578e-01 (2.38e-01)	2.3772e-01 (2.71e-01)	1.5380e-01 (1.92e-01)
PI-HS-T2	0 (0)	**1.8848e-01 (3.01e-01)**	1.1057e-01 (1.75e-01)	7.7854e-02 (1.82e-01)	5.6271e-02 (1.38e-01)	6.9171e-02 (1.33e-01)
PI-MS-T1	2.3132e-01 (6.83e-02)	3.0637e-01 (3.46e-02)	**3.0646e-01 (3.27e-02)**	2.7761e-01 (4.66e-02)	2.8183e-01 (3.76e-02)	2.8799e-01 (4.22e-02)
PI-MS-T2	2.1519e-02 (3.66e-02)	2.3101e-02 (3.90e-02)	8.7516e-03 (2.67e-02)	1.4697e-02 (3.30e-02)	**2.5819e-02 (3.99e-02)**	1.8064e-02 (3.42e-02)
PI-LS-T1	3.4549e-01 (1.60e-02)	3.4145e-01 (1.84e-02)	3.4596e-01 (1.02e-02)	3.4413e-01 (1.76e-02)	3.4369e-01 (1.37e-02)	**3.4694e-01 (9.82e-03)**
PI-LS-T2	0 (0)	0 (0)	6.4052e-03 (1.60e-02)	4.9552e-03 (1.51e-02)	3.2490e-02 (6.13e-02)	**8.2488e-02 (1.60e-01)**
NI-HS-T1	1.5830e-02 (5.05e-02)	**2.0635e-01 (1.65e-02)**	2.0041e-01 (2.27e-02)	1.9502e-01 (1.40e-02)	1.9880e-01 (2.99e-02)	1.8927e-01 (1.56e-02)
NI-HS-T2	9.0909e-02 (2.45e-10)	**7.1983e-01 (2.14e-04)**	7.1980e-01 (2.09e-04)	7.1979e-01 (2.10e-04)	7.1967e-01 (2.62e-04)	7.1953e-01 (2.68e-04)
NI-MS-T1	8.2056e-01 (2.81e-01)	**9.1485e-01 (2.16e-02)**	9.1027e-01 (3.04e-02)	9.0890e-01 (1.52e-02)	9.0354e-01 (3.12e-02)	8.6397e-01 (1.65e-01)
NI-MS-T2	9.0179e-02 (7.75e-04)	4.0356e-01 (7.88e-02)	**4.2920e-01 (4.94e-02)**	4.2376e-01 (5.63e-02)	3.9699e-01 (8.36e-02)	3.7686e-01 (9.23e-02)
NI-LS-T1	**9.3079e-01 (2.59e-03)**	9.2925e-01 (3.09e-03)	9.1110e-01 (5.77e-02)	8.3500e-01 (1.24e-01)	7.5736e-01 (1.32e-01)	6.9208e-01 (1.06e-01)
NI-LS-T2	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	**1.3282e-02 (7.27e-02)**
CPLX1-T1	7.1980e-01 (1.78e-04)	7.1981e-01 (1.90e-04)	7.1977e-01 (2.07e-04)	**7.1989e-01 (1.99e-04)**	7.1987e-01 (1.81e-04)	7.1987e-01 (2.57e-04)
CPLX1-T2	5.8883e-01 (9.68e-02)	7.0452e-01 (1.15e-02)	7.1092e-01 (6.18e-03)	**7.1106e-01 (7.54e-03)**	7.0956e-01 (9.40e-03)	7.1021e-01 (6.18e-03)
CPLX2-T1	7.1918e-01 (2.13e-04)	7.1917e-01 (2.04e-04)	7.1926e-01 (1.86e-04)	7.1930e-01 (2.32e-04)	7.1926e-01 (1.61e-04)	**7.1932e-01 (1.75e-04)**
CPLX2-T2	7.6470e-01 (2.97e-03)	7.6826e-01 (8.25e-04)	7.6852e-01 (8.33e-04)	7.6849e-01 (7.44e-04)	7.6895e-01 (5.32e-04)	**7.6905e-01 (5.87e-04)**
CPLX3-T1	5.1904e-01 (9.31e-02)	6.2372e-01 (4.36e-02)	6.4087e-01 (3.65e-02)	6.3554e-01 (3.27e-02)	**6.4147e-01 (1.74e-02)**	6.2775e-01 (3.91e-02)
CPLX3-T2	7.2611e-01 (2.16e-02)	7.3462e-01 (1.32e-02)	7.3470e-01 (1.45e-02)	7.3230e-01 (1.29e-02)	**7.3514e-01 (9.70e-03)**	7.2919e-01 (1.35e-02)
CPLX4-T1	6.6572e-01 (1.87e-02)	6.8074e-01 (1.55e-02)	6.8005e-01 (1.56e-02)	**6.8241e-01 (1.41e-02)**	6.8207e-01 (1.59e-02)	6.8096e-01 (1.18e-02)
CPLX4-T2	1.6143e-01 (1.70e-02)	**1.7843e-01 (1.30e-02)**	1.7547e-01 (1.31e-02)	1.7550e-01 (1.58e-02)	1.7366e-01 (2.04e-02)	1.7357e-01 (1.37e-02)
CPLX5-T1	7.1145e-01 (3.27e-03)	7.1362e-01 (3.33e-03)	7.1357e-01 (3.45e-03)	**7.1553e-01 (1.61e-03)**	7.1437e-01 (1.96e-03)	7.1527e-01 (1.89e-03)
CPLX5-T2	9.9455e-01 (4.59e-04)	9.9451e-01 (6.27e-04)	9.9439e-01 (8.31e-04)	9.9447e-01 (6.41e-04)	9.9437e-01 (8.36e-04)	**9.9456e-01 (4.39e-04)**
CPLX6-T1	5.9696e-01 (1.04e-01)	**6.3105e-01 (9.89e-02)**	6.0197e-01 (1.05e-01)	5.9385e-01 (9.45e-02)	5.7313e-01 (8.39e-02)	5.6207e-01 (9.21e-02)
CPLX6-T2	2.0992e-01 (1.87e-02)	2.6453e-01 (5.25e-02)	**2.9068e-01 (6.09e-02)**	2.7062e-01 (4.86e-02)	2.6350e-01 (4.77e-02)	2.5377e-01 (3.83e-02)
CPLX7-T1	7.0239e-01 (5.02e-02)	7.4714e-01 (1.15e-02)	7.4704e-01 (1.37e-02)	7.4847e-01 (1.05e-02)	7.4323e-01 (1.43e-02)	**7.4856e-01 (9.51e-03)**
CPLX7-T2	5.7892e-01 (1.24e-01)	7.0441e-01 (5.26e-03)	7.0464e-01 (6.45e-03)	**7.0637e-01 (4.31e-03)**	7.0404e-01 (6.33e-03)	7.0518e-01 (6.15e-03)
CPLX8-T1	6.5911e-01 (1.12e-01)	7.0534e-01 (9.81e-03)	7.0624e-01 (7.82e-03)	7.0604e-01 (5.54e-03)	**7.0902e-01 (6.73e-03)**	7.0863e-01 (5.74e-03)
CPLX8-T2	8.2650e-01 (2.05e-03)	8.2732e-01 (1.92e-03)	8.2775e-01 (2.35e-03)	8.2824e-01 (1.62e-03)	**8.2863e-01 (1.71e-03)**	8.2823e-01 (1.70e-03)
CPLX9-T1	9.6008e-01 (1.68e-01)	9.5097e-01 (1.75e-01)	9.7469e-01 (8.98e-02)	**9.9878e-01 (2.67e-03)**	9.2538e-01 (2.44e-01)	9.9184e-01 (2.81e-02)
CPLX9-T2	1.9862e-01 (2.34e-02)	3.1004e-01 (6.21e-02)	3.3669e-01 (3.44e-02)	3.4265e-01 (1.09e-02)	**3.4299e-01 (1.32e-02)**	3.3953e-01 (8.97e-03)
CPLX10-T1	7.2367e-01 (2.25e-03)	7.2387e-01 (2.10e-03)	7.2392e-01 (1.97e-03)	7.2454e-01 (1.77e-03)	7.2477e-01 (1.25e-03)	**7.2525e-01 (1.18e-03)**
CPLX10-T2	**6.5598e-01 (3.61e-02)**	6.3740e-01 (4.79e-02)	6.3951e-01 (4.72e-02)	6.2813e-01 (5.47e-02)	6.0737e-01 (3.84e-02)	6.0150e-01 (4.25e-02)

TABLE S-XIV
AVERAGE IGD+ FOR EACH PARAMETER τ SETTINGS IN MTDE-CSO ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

	$\tau = 0$	$\tau = 0.1$	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
CI-HS-T1	1.9195e-03 (5.66e-05)	1.8647e-03 (3.79e-05)	1.8350e-03 (2.61e-05)	1.8224e-03 (3.80e-05)	**1.8055e-03 (2.64e-05)**	1.8154e-03 (2.81e-05)
CI-HS-T2	4.7254e-03 (9.63e-04)	4.1421e-03 (5.26e-04)	4.0464e-03 (4.33e-04)	3.9550e-03 (4.50e-04)	**3.8341e-03 (4.22e-04)**	3.9896e-03 (4.08e-04)
CI-MS-T1	2.4603e-03 (8.23e-05)	2.4120e-03 (6.07e-05)	2.3515e-03 (3.98e-05)	2.3318e-03 (3.81e-05)	2.3112e-03 (2.21e-05)	**2.3005e-03 (2.42e-05)**
CI-MS-T2	2.1317e-03 (7.91e-05)	2.1168e-03 (5.98e-05)	2.0948e-03 (6.21e-05)	2.0565e-03 (5.35e-05)	2.0323e-03 (4.78e-05)	**2.0307e-03 (4.41e-05)**
CI-LS-T1	2.3249e-03 (4.66e-04)	2.1266e-03 (1.20e-04)	2.0870e-03 (1.25e-04)	2.0382e-03 (8.48e-05)	**1.9937e-03 (7.20e-05)**	1.9969e-03 (4.93e-05)
CI-LS-T2	3.1595e-03 (1.46e-04)	2.9925e-03 (1.32e-04)	2.8681e-03 (8.87e-05)	2.8140e-03 (6.01e-05)	2.7726e-03 (4.91e-05)	**2.7679e-03 (4.13e-05)**
PI-HS-T1	5.1179e-01 (2.85e-01)	5.5601e-01 (2.52e-01)	**4.8941e-01 (2.98e-01)**	5.7813e-01 (2.30e-01)	6.6665e-01 (1.54e-05)	6.2237e-01 (1.68e-01)
PI-HS-T2	1.4043e+00 (8.83e-01)	1.7553e+00 (1.13e+00)	**1.0812e+00 (8.91e-01)**	1.3427e+00 (9.61e-01)	1.4958e+00 (1.08e+00)	1.4184e+00 (1.25e+00)
PI-MS-T1	**4.8830e-02 (1.50e-02)**	6.8201e-02 (3.83e-02)	5.2413e-02 (2.11e-02)	5.0482e-02 (2.25e-02)	5.9179e-02 (2.05e-02)	7.0600e-02 (3.18e-02)
PI-MS-T2	1.8909e+02 (9.47e+01)	2.0661e+02 (1.03e+02)	2.1190e+02 (9.12e+01)	**1.8085e+02 (1.24e+02)**	2.4033e+02 (9.96e+01)	2.4304e+02 (1.42e+02)
PI-LS-T1	1.1229e-02 (1.26e-02)	9.4680e-03 (1.29e-02)	7.7688e-03 (6.85e-03)	8.2552e-03 (7.04e-03)	**4.6601e-03 (4.91e-03)**	1.0094e-02 (9.02e-03)
PI-LS-T2	1.1642e+01 (9.14e+00)	1.2194e+01 (9.13e+00)	**8.4534e+00 (8.38e+00)**	1.0653e+01 (8.69e+00)	1.0275e+01 (8.67e+00)	9.2029e+00 (8.98e+00)
NI-HS-T1	4.5517e+01 (6.65e-01)	4.5530e+01 (4.98e-01)	**4.5400e+01 (5.72e-01)**	4.5709e+01 (5.72e-01)	4.5501e+01 (4.94e-01)	4.5555e+01 (7.26e-01)
NI-HS-T2	3.1136e-03 (1.40e-04)	2.9727e-03 (1.31e-04)	2.9826e-03 (1.00e-04)	2.9641e-03 (1.34e-04)	**2.9236e-03 (1.13e-04)**	2.5049e-02 (1.21e-01)
NI-MS-T1	**1.4675e+01 (1.87e+00)**	1.4994e+01 (1.25e+00)	1.7032e+01 (1.14e+01)	1.4687e+01 (2.27e+00)	1.4990e+01 (1.42e+00)	1.5355e+01 (1.18e+00)
NI-MS-T2	5.2810e-02 (7.63e-02)	**1.9324e-02 (4.71e-02)**	2.0486e-02 (4.99e-02)	3.1095e-02 (6.14e-02)	3.1369e-02 (6.13e-02)	2.0137e-02 (5.01e-02)
NI-LS-T1	**2.9181e-01 (3.32e-01)**	3.6253e-01 (3.95e-01)	3.7865e-01 (3.69e-01)	5.9522e-01 (4.37e-01)	5.0136e-01 (4.09e-01)	6.1453e-01 (3.85e-01)
NI-LS-T2	1.8172e+01 (4.62e+00)	1.8978e+01 (4.53e+00)	1.8793e+01 (4.30e+00)	1.8720e+01 (4.66e+00)	**1.7887e+01 (5.95e+00)**	1.9146e+01 (4.36e+00)
CPLX1-T1	3.6109e-03 (1.84e-04)	3.5219e-03 (1.46e-04)	3.5340e-03 (1.39e-04)	3.5415e-03 (1.55e-04)	3.5163e-03 (1.18e-04)	**3.4985e-03 (1.10e-04)**
CPLX1-T2	1.1148e-02 (4.42e-03)	**7.6296e-03 (3.67e-03)**	8.1633e-03 (3.71e-03)	1.0524e-02 (5.29e-03)	1.2432e-02 (5.50e-03)	1.2534e-02 (5.92e-03)
CPLX2-T1	3.5741e-03 (1.58e-04)	3.5064e-03 (1.59e-04)	3.5124e-03 (1.67e-04)	3.5141e-03 (1.17e-04)	3.5118e-03 (1.34e-04)	**3.4776e-03 (1.30e-04)**
CPLX2-T2	4.1420e-03 (5.92e-04)	3.7129e-03 (2.09e-04)	3.5858e-03 (1.79e-04)	**3.5569e-03 (1.73e-04)**	3.6332e-03 (1.48e-04)	3.5986e-03 (1.49e-04)
CPLX3-T1	6.1334e-02 (3.50e-02)	4.7798e-02 (1.87e-02)	4.5871e-02 (2.29e-02)	**4.3594e-02 (7.54e-03)**	4.5317e-02 (9.03e-03)	4.5913e-02 (8.52e-03)
CPLX3-T2	2.2067e-02 (9.01e-03)	**2.0030e-02 (6.39e-03)**	2.1570e-02 (1.08e-02)	2.0239e-02 (5.76e-03)	2.2543e-02 (9.14e-03)	2.1730e-02 (6.28e-03)
CPLX4-T1	1.7686e-01 (1.64e-02)	1.6248e-01 (1.29e-02)	**1.5785e-01 (1.13e-02)**	1.6258e-01 (1.09e-02)	1.6330e-01 (1.15e-02)	1.6440e-01 (1.38e-02)
CPLX4-T2	2.5444e-01 (1.10e-02)	2.3996e-01 (1.13e-02)	**2.3779e-01 (1.22e-02)**	2.3871e-01 (1.26e-02)	2.3927e-01 (9.74e-03)	2.3905e-01 (8.61e-03)
CPLX5-T1	9.7489e-03 (1.44e-03)	**9.2737e-03 (9.93e-04)**	1.0234e-02 (2.13e-03)	1.1053e-02 (2.62e-03)	1.0844e-02 (1.53e-03)	1.1476e-02 (1.85e-03)
CPLX5-T2	6.9628e-02 (2.67e-02)	**6.0569e-02 (1.10e-02)**	6.1622e-02 (7.50e-03)	6.1594e-02 (8.45e-03)	6.2359e-02 (8.20e-03)	6.7049e-02 (9.22e-03)
CPLX6-T1	1.1498e-01 (5.11e-02)	**8.7223e-02 (5.15e-02)**	9.6896e-02 (5.30e-02)	9.3320e-02 (5.20e-02)	8.8462e-02 (5.75e-02)	1.0722e-01 (4.61e-02)
CPLX6-T2	2.1982e-01 (6.04e-02)	1.8780e-01 (6.89e-02)	**1.7704e-01 (7.83e-02)**	1.9916e-01 (5.75e-02)	1.8923e-01 (7.03e-02)	2.1281e-01 (5.69e-02)
CPLX7-T1	2.6388e-02 (6.32e-03)	**2.0041e-02 (4.02e-03)**	2.1123e-02 (3.86e-03)	2.1456e-02 (4.42e-03)	2.2307e-02 (4.44e-03)	2.2714e-02 (5.49e-03)
CPLX7-T2	2.0987e-02 (5.00e-03)	**1.7943e-02 (2.32e-03)**	1.8570e-02 (3.28e-03)	1.9541e-02 (3.69e-03)	1.8803e-02 (3.22e-03)	1.8714e-02 (3.28e-03)
CPLX8-T1	2.4466e-02 (7.31e-03)	2.2879e-02 (3.53e-03)	**2.0447e-02 (4.00e-03)**	2.1863e-02 (3.11e-03)	2.2399e-02 (3.14e-03)	2.3987e-02 (3.88e-03)
CPLX8-T2	5.5511e-03 (1.47e-03)	4.5801e-03 (5.39e-04)	4.4450e-03 (6.24e-04)	4.3645e-03 (5.03e-04)	**4.3436e-03 (5.03e-04)**	4.5423e-03 (6.20e-04)
CPLX9-T1	9.5282e-01 (2.22e+00)	**1.1698e-01 (9.99e-02)**	1.5924e-01 (3.69e-01)	1.2792e-01 (1.45e-01)	1.1745e-01 (1.19e-01)	1.3176e-01 (1.20e-01)
CPLX9-T2	1.0817e-01 (8.31e-02)	6.6682e-02 (7.98e-03)	6.8093e-02 (9.61e-03)	6.8231e-02 (6.26e-03)	**6.5070e-02 (6.39e-03)**	6.9535e-02 (5.34e-03)
CPLX10-T1	3.5800e-03 (4.10e-04)	3.4783e-03 (2.18e-04)	3.4332e-03 (1.55e-04)	**3.4134e-03 (1.30e-04)**	3.4227e-03 (1.38e-04)	3.4901e-03 (1.16e-04)
CPLX10-T2	1.2096e-01 (3.59e-02)	**1.1865e-01 (3.66e-02)**	1.2724e-01 (3.34e-02)	1.1895e-01 (2.20e-02)	1.2853e-01 (2.55e-02)	1.3008e-01 (2.71e-02)

TABLE S-XV
AVERAGE HV FOR EACH PARAMETER τ SETTINGS IN MTDE-CSO ON CEC17-MTMO AND CEC19-MTMO BENCHMARK SUITES.

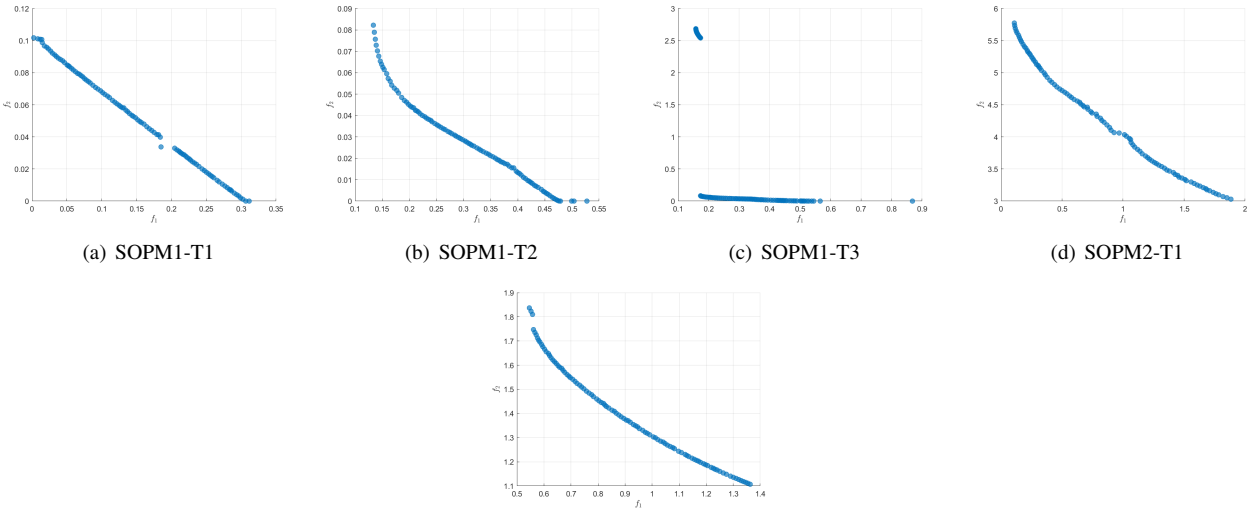
	$\tau = 0$	$\tau = 0.1$	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
CI-HS-T1	3.4729e-01 (9.06e-05)	3.4738e-01 (7.17e-05)	3.4743e-01 (5.50e-05)	3.4746e-01 (7.33e-05)	**3.4749e-01 (5.85e-05)**	3.4746e-01 (5.71e-05)
CI-HS-T2	4.4147e-01 (1.55e-03)	4.4244e-01 (8.94e-04)	4.4260e-01 (7.15e-04)	4.4277e-01 (7.62e-04)	**4.4297e-01 (7.16e-04)**	4.4270e-01 (6.95e-04)
CI-MS-T1	4.4478e-01 (1.30e-04)	4.4487e-01 (9.19e-05)	4.4496e-01 (5.92e-05)	4.4499e-01 (5.94e-05)	4.4502e-01 (4.20e-05)	**4.4504e-01 (3.57e-05)**
CI-MS-T2	3.4698e-01 (1.31e-04)	3.4699e-01 (1.05e-04)	3.4704e-01 (1.11e-04)	3.4710e-01 (9.74e-05)	**3.4715e-01 (7.92e-05)**	3.4714e-01 (7.84e-05)
CI-LS-T1	3.4671e-01 (7.04e-04)	3.4702e-01 (1.99e-04)	3.4708e-01 (1.98e-04)	3.4717e-01 (1.44e-04)	**3.4724e-01 (1.25e-04)**	3.4723e-01 (8.40e-05)
CI-LS-T2	7.2019e-01 (2.19e-04)	7.2046e-01 (1.99e-04)	7.2066e-01 (1.38e-04)	7.2074e-01 (8.58e-05)	7.2080e-01 (7.22e-05)	**7.2080e-01 (6.25e-05)**
PI-HS-T1	2.3766e-01 (2.71e-01)	1.9578e-01 (2.38e-01)	**2.5889e-01 (2.83e-01)**	1.7481e-01 (2.18e-01)	9.0912e-02 (1.40e-05)	1.3287e-01 (1.60e-01)
PI-HS-T2	9.5653e-02 (1.93e-01)	7.7854e-02 (1.82e-01)	**1.6448e-01 (2.57e-01)**	9.6017e-02 (1.78e-01)	4.2423e-02 (4.61e-02)	9.3421e-02 (1.76e-01)
PI-MS-T1	**3.0709e-01 (2.01e-02)**	2.8217e-01 (4.66e-02)	3.0221e-01 (2.82e-02)	3.0478e-01 (3.03e-02)	2.9317e-01 (2.77e-02)	2.7824e-01 (4.12e-02)
PI-MS-T2	2.0092e-02 (3.72e-02)	1.4782e-02 (3.32e-02)	1.4105e-02 (3.22e-02)	**2.7988e-02 (4.04e-02)**	1.1760e-02 (3.05e-02)	1.6806e-02 (3.42e-02)
PI-LS-T1	3.4164e-01 (1.72e-02)	3.4407e-01 (1.76e-02)	3.4635e-01 (9.58e-03)	3.4565e-01 (9.80e-03)	**3.5070e-01 (6.86e-03)**	3.4316e-01 (1.24e-02)
PI-LS-T2	**9.9056e-02 (1.47e-01)**	5.4879e-02 (8.08e-02)	5.4725e-02 (9.53e-02)	7.2200e-02 (1.37e-01)	5.7284e-02 (9.21e-02)	9.8248e-02 (1.25e-01)
NI-HS-T1	2.7004e-01 (2.08e-02)	2.6970e-01 (1.56e-02)	**2.7364e-01 (1.77e-02)**	2.6417e-01 (1.80e-02)	2.7062e-01 (1.53e-02)	2.6026e-01 (3.53e-02)
NI-HS-T2	7.1958e-01 (2.21e-04)	7.1979e-01 (2.10e-04)	7.1978e-01 (1.63e-04)	7.1981e-01 (2.17e-04)	**7.1988e-01 (1.86e-04)**	6.9892e-01 (1.15e-01)
NI-MS-T1	9.4093e-01 (1.61e-02)	**9.4443e-01 (8.91e-03)**	9.2425e-01 (1.07e-01)	9.4385e-01 (1.67e-02)	9.4262e-01 (1.05e-02)	9.4022e-01 (1.09e-02)
NI-MS-T2	3.8436e-01 (9.05e-02)	**4.2380e-01 (5.63e-02)**	4.2254e-01 (5.92e-02)	4.0992e-01 (7.29e-02)	4.0951e-01 (7.27e-02)	4.2312e-01 (5.94e-02)
NI-LS-T1	**6.8230e-01 (2.11e-01)**	6.4054e-01 (2.42e-01)	6.2278e-01 (2.31e-01)	4.9697e-01 (2.66e-01)	5.4905e-01 (2.50e-01)	4.7469e-01 (2.31e-01)
NI-LS-T2	**5.2623e-03 (2.88e-02)**	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
CPLX1-T1	7.1967e-01 (2.76e-04)	7.1983e-01 (1.99e-04)	7.1980e-01 (2.10e-04)	7.1981e-01 (2.04e-04)	7.1982e-01 (1.74e-04)	**7.1986e-01 (1.67e-04)**
CPLX1-T2	7.0682e-01 (8.63e-03)	**7.1246e-01 (7.56e-03)**	7.1219e-01 (6.59e-03)	7.0766e-01 (1.09e-02)	7.0428e-01 (1.17e-02)	6.9846e-01 (1.73e-02)
CPLX2-T1	7.2137e-01 (2.42e-04)	7.2153e-01 (2.31e-04)	7.2151e-01 (2.54e-04)	7.2151e-01 (1.66e-04)	7.2151e-01 (2.04e-04)	**7.2157e-01 (1.71e-04)**
CPLX2-T2	8.1326e-01 (8.04e-04)	8.1379e-01 (8.98e-04)	**8.1427e-01 (8.01e-04)**	8.1422e-01 (7.59e-04)	8.1389e-01 (7.07e-04)	8.1420e-01 (9.75e-04)
CPLX3-T1	6.1519e-01 (5.56e-02)	6.3503e-01 (3.26e-02)	6.4119e-01 (4.19e-02)	**6.4300e-01 (1.60e-02)**	6.3937e-01 (1.84e-02)	6.4098e-01 (1.78e-02)
CPLX3-T2	7.2472e-01 (1.55e-02)	7.2744e-01 (1.24e-02)	7.2540e-01 (1.95e-02)	**7.2867e-01 (1.16e-02)**	7.2448e-01 (1.74e-02)	7.2733e-01 (1.12e-02)
CPLX4-T1	5.7165e-01 (2.76e-02)	5.9004e-01 (2.55e-02)	**5.9942e-01 (2.36e-02)**	5.8605e-01 (2.16e-02)	5.8405e-01 (2.26e-02)	5.8291e-01 (2.60e-02)
CPLX4-T2	4.3469e-01 (7.42e-03)	4.4361e-01 (1.15e-02)	4.4344e-01 (9.55e-03)	4.4405e-01 (1.12e-02)	4.4342e-01 (8.49e-03)	**4.4543e-01 (8.75e-03)**
CPLX5-T1	7.1723e-01 (2.53e-03)	**7.1844e-01 (1.66e-03)**	7.1703e-01 (2.49e-03)	7.1609e-01 (3.69e-03)	7.1613e-01 (2.68e-03)	7.1564e-01 (2.73e-03)
CPLX5-T2	9.9268e-01 (1.36e-03)	9.9304e-01 (5.38e-04)	9.9307e-01 (3.30e-04)	9.9292e-01 (4.45e-04)	**9.9308e-01 (4.59e-04)**	9.9285e-01 (5.25e-04)
CPLX6-T1	5.4086e-01 (9.10e-02)	**5.8992e-01 (9.67e-02)**	5.6832e-01 (9.82e-02)	5.7620e-01 (9.68e-02)	5.8711e-01 (1.07e-01)	5.4846e-01 (8.72e-02)
CPLX6-T2	2.9642e-01 (5.69e-02)	3.2121e-01 (6.20e-02)	**3.3931e-01 (7.51e-02)**	3.1174e-01 (5.84e-02)	3.2037e-01 (6.83e-02)	3.0159e-01 (5.39e-02)
CPLX7-T1	7.6102e-01 (1.54e-02)	**7.6897e-01 (1.36e-02)**	7.6850e-01 (1.25e-02)	7.6657e-01 (1.62e-02)	7.6795e-01 (1.47e-02)	7.6724e-01 (1.62e-02)
CPLX7-T2	7.0696e-01 (6.69e-03)	**7.1107e-01 (4.41e-03)**	7.0963e-01 (5.68e-03)	7.0838e-01 (5.69e-03)	7.0989e-01 (4.94e-03)	7.0986e-01 (5.07e-03)
CPLX8-T1	7.0421e-01 (9.95e-03)	7.0558e-01 (5.38e-03)	**7.0984e-01 (5.88e-03)**	7.0750e-01 (5.27e-03)	7.0612e-01 (5.25e-03)	7.0503e-01 (5.99e-03)
CPLX8-T2	7.6946e-01 (6.17e-03)	7.7240e-01 (3.33e-03)	7.7216e-01 (3.90e-03)	7.7233e-01 (3.67e-03)	**7.7344e-01 (3.19e-03)**	7.7248e-01 (4.03e-03)
CPLX9-T1	9.9481e-01 (9.55e-03)	**9.9991e-01 (4.32e-04)**	9.9955e-01 (2.02e-03)	9.9859e-01 (5.37e-03)	9.9829e-01 (6.48e-03)	9.9910e-01 (4.75e-03)
CPLX9-T2	3.1368e-01 (6.38e-02)	3.4665e-01 (1.12e-02)	3.4405e-01 (1.37e-02)	3.4411e-01 (1.11e-02)	**3.4789e-01 (1.03e-02)**	3.4022e-01 (7.94e-03)
CPLX10-T1	7.1208e-01 (1.60e-03)	7.1270e-01 (1.50e-03)	7.1269e-01 (1.00e-03)	**7.1279e-01 (9.68e-04)**	7.1277e-01 (1.12e-03)	7.1224e-01 (1.40e-03)
CPLX10-T2	8.5876e-01 (4.56e-02)	8.5947e-01 (4.47e-02)	8.4973e-01 (4.88e-02)	**8.6196e-01 (3.51e-02)**	8.4631e-01 (3.92e-02)	8.3820e-01 (4.03e-02)



(a) SOPM1-T1 (b) SOPM1-T2 (c) SOPM1-T3 (d) SOPM2-T1

(e) SOPM2-T2

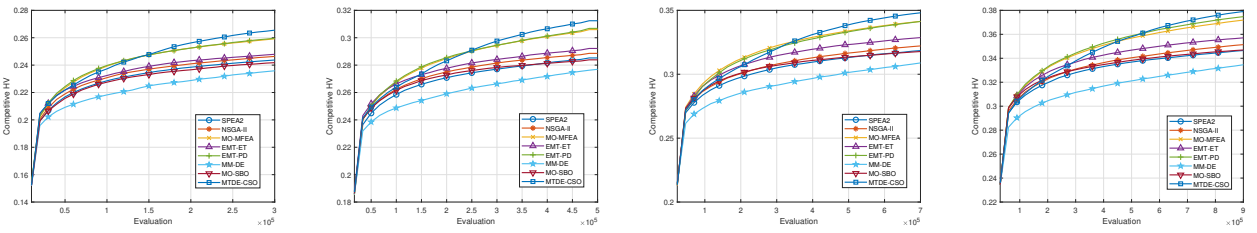
Fig. S-3. The HV convergence plots of MTDE-CSO comparing with other algorithms on synchronous optimal pulse-width modulation problems.



(a) SOPM1-T1 (b) SOPM1-T2 (c) SOPM1-T3 (d) SOPM2-T1

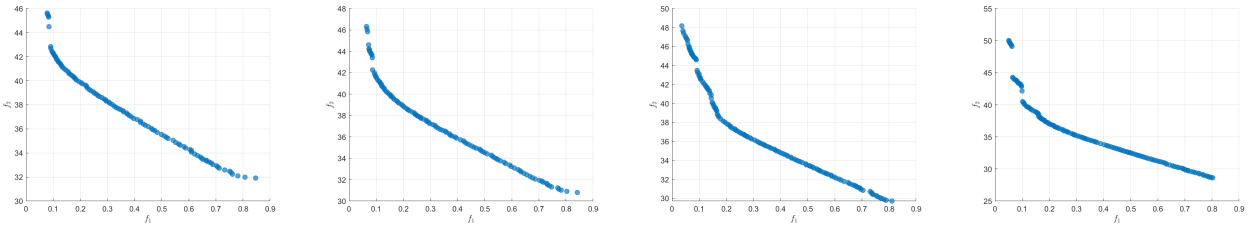
(e) SOPM2-T2

Fig. S-4. The final no-dominated solutions plots of MTDE-CSO on synchronous optimal pulse-width modulation problems.



(a) SCP(29-31) (b) SCP(28-32) (c) SCP(27-33) (d) SCP(26-34)

Fig. S-5. The competitive HV convergence plots of MTDE-CSO comparing with other algorithms on sensor coverage problems.



(a) SCP(29-31) (b) SCP(28-32) (c) SCP(27-33) (d) SCP(26-34)

Fig. S-6. The final no-dominated solutions plots of MTDE-CSO on sensor coverage problems.