Supplementary File of "Multiobjective Multitasking Optimization with Decomposition-based Transfer Selection"

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TABLE A.I
THE MEAN VALUES AND STANDARD DEVIATIONS of IGD and MSS RESULTS OBTAINED BY THE COMPARED VARIANTS IN CEC2017

CEC2017	NO-KT		NO-DTS		KT-1		KT-2		MMTEA-DTS	
	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS
CIHS1	3.23E-03 + (1.00E-03)	2.35 +	2.18E-04 + (2.57E-05)	0.37 +	1.80E-04 + (1.04E-05)	-0.02 +	**1.75E-04 ≈ (3.80E-06)**	**-0.09 -**	1.76E-04 (5.08E-06)	-0.05
CIHS2	3.04E-03 + (6.48E-04)		1.30E-03 + (2.31E-04)		5.12E-04 + (1.15E-04)		**3.69E-04 – (6.53E-05)**		4.42E-04 (7.70E-05)	
CIMS1	1.53E-02 + (1.41E-02)	1.42 +	1.41E-04 + (4.03E-07)	0.71 +	1.41E-04 ≈ (9.44E-08)	0.00 +	1.41E-04 + (1.21E-07)	-0.19 +	**1.41E-04 (8.60E-08)**	**-0.20**
CIMS2	1.74E-04 + (5.22E-07)		1.75E-04 + (6.35E-07)		1.74E-04 + (3.64E-07)		1.74E-04 ≈ (1.55E-07)		**1.74E-04 (1.53E-07)**	
CILS1	8.58E-01 + (6.09E-01)	2.21 +	5.10E-04 + (8.68E-05)	0.05 +	1.97E-04 + (4.74E-05)	-0.01 +	1.83E-04 ≈ (5.23E-06)	-0.01 +	**1.82E-04 (8.13E-06)**	**-0.02**
CILS2	3.21E-04 + (2.35E-05)		1.71E-04 + (1.69E-06)		1.62E-04 ≈ (1.58E-06)		1.62E-04 ≈ (1.72E-06)		**1.62E-04 (1.52E-06)**	
PIHS1	1.61E-03 + (3.85E-04)	2.04 +	9.91E-04 + (3.57E-04)	0.32 +	1.05E-03 + (3.46E-04)	0.25 +	**4.48E-04 – (1.09E-04)**	**-0.35 -**	5.50E-04 (1.63E-04)	-0.25
PIHS2	2.62E+00 + (5.07E-01)		2.80E-01 + (2.13E-01)		1.03E-02 + (1.24E-02)		**2.89E-03 ≈ (4.15E-03)**		3.69E-03 (5.41E-03)	
PIMS1	4.45E-03 ≈ (1.50E-03)	0.28 +	**3.10E-03 – (1.43E-03)**	**-0.28 -**	6.07E-02 ≈ (8.94E-02)	0.53 +	1.43E-02 ≈ (1.69E-02)	-0.22 -	1.45E-02 (1.70E-02)	-0.08
PIMS2	1.77E+01 + (5.73E+00)		1.26E+01 ≈ (4.09E+00)		1.43E+01 ≈ (3.90E+00)		**1.20E+01 ≈ (4.06E+00)**		1.33E+01 (3.76E+00)	
PILS1	**3.03E-04 – (1.16E-04)**	1.16 +	4.56E-04 ≈ (2.74E-04)	0.97 +	4.47E-04 ≈ (2.96E-04)	0.31 +	3.92E-04 ≈ (1.53E-04)	0.18 +	3.86E-04 (1.46E-04)	**0.17**
PILS2	6.31E-01 + (2.96E-03)		3.42E-01 + (1.55E-01)		**8.18E-04 ≈ (2.52E-04)**		8.76E-04 ≈ (2.78E-04)		9.37E-04 (3.50E-04)	
NIHS1	2.02E+01 + (4.00E+01)	1.62 +	1.52E+00 + (1.26E-02)	0.14 +	**1.45E+00 ≈ (2.32E-02)**	0.00 +	1.45E+00 ≈ (2.43E-02)	**-0.11 -**	1.46E+00 (2.00E-02)	-0.10
NIHS2	1.15E-03 + (2.81E-04)		3.94E-04 + (8.97E-05)		2.86E-04 + (5.52E-05)		**2.04E-04 ≈ (1.33E-05)**		2.12E-04 (1.72E-05)	
NIMS1	2.13E-01 + (2.10E-01)	0.97 +	1.58E-01 + (1.07E-01)	0.34 +	**9.89E-02 ≈ (1.01E-02)**	**-0.05 -**	9.99E-02 ≈ (1.34E-02)	-0.03 +	1.02E-01 (1.23E-02)	-0.04
NIMS2	3.01E-03 + (4.63E-03)		9.13E-04 + (3.09E-03)		1.96E-04 ≈ (3.07E-05)		2.49E-04 + (8.48E-05)		**1.89E-04 (3.81E-05)**	
NILS1	8.75E-04 + (7.07E-05)	0.13 +	8.85E-04 + (7.49E-05)	**-0.14 -**	8.42E-04 ≈ (4.52E-05)	-0.04 -	8.57E-04 ≈ (7.44E-05)	0.16 +	**8.36E-04 (2.12E-05)**	-0.01
NILS2	5.91E-01 – (1.58E-01)		**5.13E-01 – (2.37E-01)**		5.89E-01 ≈ (1.62E-01)		6.42E-01 ≈ (4.00E-04)		6.42E-01 (1.32E-04)	
≈/+/-	1/15/2	0/9/0	2/14/2	0/7/2	11/7/0	0/7/2	14/2/2	0/5/4	/	/
Rank	4.61		3.80		2.39		2.16		**2.04**	

TABLE A.II
THE MEAN VALUES AND STANDARD DEVIATIONS of IGD and MSS RESULTS OBTAINED BY THE COMPARED VARIANTS IN CEC2019

CEC2019	NO-KT		NO-DTS		KT-1		KT-2		MMTEA-DTS	
	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS
CPLX1_1	2.41E-04 ≈ (2.12E-05)	0.35 +	2.51E-04 ≈ (2.55E-05)	1.06 +	**2.38E-04 ≈ (1.68E-05)**	**-0.09 -**	2.51E-04 ≈ (2.37E-05)	0.30 -	2.50E-04 (2.54E-05)	0.32
CPLX1_2	3.68E-04 + (3.88E-05)		4.18E-04 + (7.12E-05)		**3.32E-04 - (2.00E-05)**		3.43E-04 ≈ (1.74E-05)		3.46E-04 (2.10E-05)	
CPLX2_1	2.42E-04 ≈ (1.96E-05)	1.24 +	2.51E-04 ≈ (2.37E-05)	0.38 +	**2.41E-04 ≈ (1.89E-05)**	**0.11 -**	2.48E-04 ≈ (2.51E-05)	0.28 +	2.44E-04 ≈ (1.96E-05)	0.19
CPLX2_2	5.86E-03 + (2.49E-03)		7.94E-04 + (1.57E-04)		7.48E-04 ≈ (3.07E-04)		**6.70E-04 ≈ (2.21E-04)**		7.17E-04 (2.21E-04)	
CPLX3_1	2.19E-03 + (5.37E-04)	0.29 +	2.02E-03 + (3.91E-04)	0.59 +	1.51E-03 ≈ (4.76E-04)	0.12 +	**1.39E-03 ≈ (2.61E-04)**	**-0.11 -**	1.47E-03 (4.21E-04)	-0.09
CPLX3_2	**1.23E-03 - (1.89E-04)**		1.42E-03 ≈ (2.24E-04)		1.42E-03 ≈ (1.73E-04)		1.37E-03 ≈ (1.89E-04)		1.35E-03 (1.95E-04)	
CPLX4_1	2.14E-03 + (7.18E-04)	1.74 +	2.06E-03 + (4.44E-04)	1.12 +	**1.11E-03 ≈ (9.62E-05)**	**-0.12 -**	1.15E-03 ≈ (1.00E-04)	-0.02 +	1.14E-03 (2.04E-04)	-0.07
CPLX4_2	3.10E-03 + (1.09E-03)		2.02E-03 + (4.81E-04)		**1.11E-03 ≈ (9.50E-05)**		1.25E-03 ≈ (9.19E-05)		1.15E-03 (2.35E-04)	
CPLX5_1	1.50E-03 + (2.13E-04)	0.16 +	1.59E-03 + (2.14E-04)	0.54 +	1.26E-03 ≈ (1.61E-04)	-0.08 +	1.25E-03 ≈ (1.81E-04)	-0.18 +	**1.25E-03 (1.65E-04)**	**-0.23**
CPLX5_2	5.06E-03 ≈ (7.79E-04)		5.35E-03 ≈ (7.62E-04)		**5.46E-03 ≈ (8.53E-04)**		5.36E-03 ≈ (5.42E-04)		5.30E-03 (8.13E-04)	
CPLX6_1	1.51E-03 ≈ (2.23E-04)	0.38 +	1.59E-03 ≈ (2.19E-04)	0.39 +	1.57E-03 ≈ (1.77E-04)	-0.03 +	1.52E-03 ≈ (1.50E-04)	-0.24 +	**1.49E-03 (1.92E-04)**	**-0.25**
CPLX6_2	2.86E-03 + (1.13E-03)		2.57E-03 + (5.58E-04)		2.02E-03 ≈ (4.00E-04)		**1.90E-03 ≈ (4.16E-04)**		1.99E-03 (2.90E-04)	
CPLX7_1	1.23E-03 + (1.46E-04)	0.57 +	1.19E-03 + (1.53E-04)	0.37 +	1.06E-03 ≈ (1.78E-04)	**-0.27 -**	**9.99E-04 ≈ (1.51E-04)**	-0.24 +	1.02E-03 (1.59E-04)	-0.26
CPLX7_2	1.48E-03 ≈ (3.03E-04)		1.44E-03 ≈ (2.99E-04)		**1.27E-03 ≈ (2.18E-04)**		1.38E-03 ≈ (2.92E-04)		1.34E-03 (2.61E-04)	
CPLX8_1	**1.48E-03 - (2.68E-04)**	0.41 +	1.54E-03 ≈ (3.02E-04)	0.20 +	1.63E-03 ≈ (3.07E-04)	**-0.09 -**	1.68E-03 ≈ (2.59E-04)	0.02 +	1.66E-03 (2.39E-04)	-0.05
CPLX8_2	3.45E-03 + (2.03E-03)		2.34E-03 + (1.74E-03)		8.66E-04 ≈ (5.37E-04)		9.23E-04 ≈ (7.11E-04)		**8.15E-04 (8.61E-04)**	
CPLX9_1	4.97E-03 ≈ (6.20E-04)	0.31 +	5.06E-03 ≈ (5.90E-04)	0.60 +	5.18E-03 ≈ (5.67E-04)	**-0.07 -**	5.35E-03 ≈ (1.37E-03)	-0.01 -	**5.29E-03 (5.13E-04)**	0.06
CPLX9_2	2.55E-03 + (7.47E-04)		2.89E-03 + (9.34E-04)		1.82E-03 ≈ (2.17E-04)		**1.75E-03 - (1.89E-04)**		1.91E-03 (2.82E-04)	
CPLX10_1	6.27E-03 + (2.80E-03)	1.73 +	5.58E-03 + (2.49E-03)	1.07 +	1.74E-03 ≈ (9.26E-04)	-0.10 +	1.50E-03 ≈ (9.37E-04)	-0.24 +	**1.39E-03 (7.85E-04)**	**-0.26**
CPLX10_2	1.07E-02 + (3.17E-03)		6.80E-03 + (1.61E-03)		3.29E-03 + (1.13E-03)		2.57E-03 ≈ (1.10E-03)		**2.52E-03 (8.74E-04)**	
≈/+/-	6/12/2	0/10/0	8/12/0	0/10/0	18/1/1	0/4/6	19/0/1	0/7/3	/	/
Rank	4.04		3.83		2.40		2.41		**2.32**	

TABLE A.III
THE MEAN VALUES AND STANDARD DEVIATIONS of IGD and MSS RESULTS OBTAINED BY THE COMPARED VARIANTS IN CEC2021

ETMO2021	NO-KT		NO-DTS		KT-1		KT-2		MMTEA-DTS	
	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS
ETMOF1_1	9.73E-04 + (1.17E-04)	1.66 +	7.28E-04 + (6.91E-05)	0.20 +	6.75E-04 ≈ (5.43E-05)	-0.07 +	**6.46E-04 ≈ (5.84E-05)**	**-0.20** -	6.52E-04 (5.95E-05)	-0.17
ETMOF1_2	3.25E-03 + (2.41E-03)		1.68E-03 + (1.75E-04)		1.45E-03 ≈ (1.24E-04)		**1.38E-03 ≈ (1.39E-04)**		1.41E-03 (1.21E-04)	
ETMOF2_1	7.89E-04 + (1.46E-04)	1.98 +	6.61E-04 + (9.54E-05)	0.94 +	3.77E-04 ≈ (4.36E-05)	-0.21 +	**3.64E-04 ≈ (3.70E-05)**	**-0.35** -	3.79E-04 (3.56E-05)	-0.23
ETMOF2_2	9.44E-03 + (4.42E-04)		8.15E-03 + (2.37E-04)		7.38E-03 ≈ (3.06E-04)		**7.18E-03 ≈ (3.23E-04)**		7.34E-03 (3.14E-04)	
ETMOF3_1	3.18E-03 + (1.72E-03)	0.88 +	2.55E-03 + (1.26E-03)	0.22 +	3.39E-03 + (3.07E-03)	0.50 +	2.02E-03 ≈ (1.22E-03)	-0.01 +	**1.95E-03 (4.05E-04)**	**-0.05**
ETMOF3_2	3.74E-03 + (9.02E-04)		2.95E-03 ≈ (5.62E-04)		3.03E-03 ≈ (1.06E-03)		**2.73E-03 ≈ (5.24E-04)**		2.84E-03 (5.18E-04)	
ETMOF4_1	5.45E+00 + (3.89E+00)	0.88 +	3.65E+00 + (1.53E+00)	0.18 +	4.52E+00 ≈ (4.17E+00)	0.31 +	2.94E+00 ≈ (2.52E+00)	-0.09 +	**2.78E+00 (2.65E+00)**	**-0.19**
ETMOF4_2	5.62E-01 + (3.75E-01)		3.98E-01 + (4.00E-02)		3.96E-01 + (6.95E-02)		3.52E-01 ≈ (3.80E-02)		**3.47E-01 (5.89E-02)**	
ETMOF5_1	2.68E-01 + (2.11E-03)	0.78 +	2.42E-01 ≈ (7.21E-02)	0.39 +	2.69E-01 + (2.05E-03)	-0.04 +	2.67E-01 ≈ (2.33E-03)	-0.08 +	**2.66E-01 (2.68E-03)**	**-0.12**
ETMOF5_2	4.25E-01 + (9.33E-02)		4.23E-01 + (1.12E-01)		2.42E-01 ≈ (1.57E-02)		2.37E-01 ≈ (2.33E-02)		**2.34E-01 (2.58E-02)**	
ETMOF6_1	1.12E+00 + (1.50E-01)	0.89 +	1.25E+00 + (1.93E-01)	1.38 +	**6.35E-01 ≈ (2.10E-01)**	**-0.31 -**	6.49E-01 ≈ (1.60E-01)	-0.29 -	6.65E-01 (2.01E-01)	-0.26
ETMOF6_2	1.58E-01 + (1.19E-01)		2.35E-01 + (2.00E-01)		**4.12E-02 ≈ (2.38E-02)**		4.10E-02 ≈ (2.13E-02)		4.27E-02 (3.41E-02)	
ETMOF7_1	5.20E-03 + (4.08E-03)	0.65 +	**1.05E-03 – (2.24E-04)**	**-0.04 -**	1.83E-03 ≈ (3.80E-03)	0.30 +	1.51E-03 ≈ (1.42E-03)	0.02 -	1.69E-03 (1.22E-03)	0.04
ETMOF7_2	1.63E-02 – (9.75E-04)		**1.59E-02 – (1.35E-03)**		7.35E-02 ≈ (3.13E-01)		1.70E-02 ≈ (5.36E-03)		1.87E-02 (6.44E-03)	
ETMOF7_3	2.26E-02 ≈ (3.39E-03)		**2.07E-02 ≈ (2.32E-03)**		2.10E-02 ≈ (4.08E-03)		2.22E-02 ≈ (3.79E-03)		2.18E-02 (3.33E-03)	
ETMOF8_1	1.12E-02 + (5.53E-03)	0.91 +	8.85E-03 + (8.93E-04)	0.24 +	**7.37E-03 ≈ (6.29E-04)**	0.03 +	7.47E-03 ≈ (7.22E-04)	0.17 +	7.58E-03 (8.01E-04)	**-0.34**
ETMOF8_2	4.63E-03 + (8.49E-04)		2.75E-03 + (5.51E-04)		2.32E-03 + (6.10E-04)		2.56E-03 ≈ (1.71E-04)		**1.99E-03 (2.00E-04)**	
ETMOF8_3	3.37E-03 + (1.10E-03)		1.55E-03 + (1.90E-04)		1.41E-03 + (1.55E-04)		1.45E-03 ≈ (5.33E-05)		**1.29E-03 (8.99E-05)**	
≈/+/-	1/16/1	0/8/0	3/13/2	0/7/1	13/5/0	0/7/1	18/0/0	0/4/4	/	/
Rank	4.43		3.62		2.50		2.23		**1.70**	

TABLE A.IV
THE MEAN VALUES AND STANDARD DEVIATIONS of IGD and MSS RESULTS OBTAINED BY THE COMPARED VARIANTS IN CEC2017

CEC2017	$a = 1$		$a = 3$		$a = 5$		$a = 7$		$a = 9$	
	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS
CIHS1	2.18E-04 + (2.57E-05)	2.18 +	1.77E-04 ≈ (3.70E-06)	-0.02 +	1.76E-04 (5.08E-06)	**-0.02**	1.76E-04 ≈ (3.36E-06)	0.02 +	**1.76E-04 ≈ (2.65E-06)**	0.02 +
CIHS2	1.30E-03 + (2.31E-04)		4.44E-04 ≈ (9.05E-05)		**4.42E-04 (7.70E-05)**		4.69E-04 ≈ (8.62E-05)		4.79E-04 + (6.99E-05)	
CIMS1	1.41E-04 + (4.03E-07)	1.50 +	**1.41E-04 - (4.67E-08)**	**-0.27 -**	1.41E-04 (8.60E-08)	-0.13	1.41E-04 ≈ (8.91E-08)	0.03 +	1.41E-04 ≈ (1.08E-07)	0.27 +
CIMS2	1.75E-04 + (6.35E-07)		**1.73E-04 ≈ (1.42E-07)**		1.74E-04 (1.53E-07)		1.74E-04 + (2.21E-07)		1.74E-04 + (2.27E-07)	
CILS1	5.10E-04 + (8.68E-05)	2.19 +	1.83E-04 ≈ (8.97E-06)	-0.15 +	**1.82E-04 (8.13E-06)**	**-0.17**	1.86E-04 + (9.54E-06)	-0.09 +	1.92E-04 + (1.08E-05)	-0.10 +
CILS2	1.71E-04 + (1.69E-06)		1.62E-04 ≈ (1.64E-06)		1.62E-04 (1.52E-06)		**1.62E-04 ≈ (1.34E-06)**		1.62E-04 ≈ (1.61E-06)	
PIHS1	9.91E-04 + (3.57E-04)	1.77 +	6.13E-04 ≈ (1.54E-04)	0.15 +	5.50E-04 (1.63E-04)	0.03	4.64E-04 - (1.22E-04)	-0.12 -	**4.48E-04 - (9.49E-05)**	**-0.14 -**
PIHS2	2.80E-01 + (2.13E-01)		4.94E-03 + (7.38E-03)		**3.69E-03 (5.41E-03)**		4.53E-03 ≈ (6.75E-03)		4.96E-03 ≈ (1.03E-02)	
PIMS1	3.10E-03 - (1.43E-03)	**-0.27 -**	1.55E-02 ≈ (2.30E-02)	0.01 -	1.45E-02 (1.70E-02)	0.20	7.79E-03 ≈ (1.33E-02)	-0.05 -	**2.58E-03 - (1.18E-03)**	-0.13 -
PIMS2	1.26E+01 ≈ (4.09E+00)		**1.15E+01 ≈ (4.05E+00)**		1.33E+01 (3.76E+00)		1.31E+01 ≈ (4.15E+00)		1.39E+01 ≈ (3.54E+00)	
PILS1	4.56E-04 ≈ (2.74E-04)	1.26 +	6.72E-04 ≈ (1.01E-03)	0.36 +	3.86E-04 (1.46E-04)	0.07	3.82E-04 - (2.18E-04)	0.07 +	**3.75E-04 ≈ (1.80E-04)**	**0.06 -**
PILS2	3.42E-01 + (1.55E-01)		1.07E-03 + (3.37E-04)		**9.37E-04 (3.50E-04)**		9.51E-04 ≈ (3.41E-04)		1.09E-03 ≈ (5.68E-04)	
NIHS1	1.52E+00 + (1.26E-02)	1.89 +	**1.46E+00 ≈ (1.70E-02)**	-0.21 +	1.46E+00 (2.00E-02)	**-0.23**	1.46E+00 ≈ (2.14E-02)	-0.20 +	1.47E+00 + (1.49E-02)	0.01 +
NIHS2	3.94E-04 + (8.97E-05)		2.15E-04 ≈ (1.53E-05)		**2.12E-04 (1.72E-05)**		2.16E-04 ≈ (1.62E-05)		2.15E-04 ≈ (1.84E-05)	
NIMS1	1.58E-01 + (1.07E-01)	0.58 +	1.18E-01 ≈ (1.23E-01)	0.08 +	**1.02E-01 (1.23E-02)**	**-0.05**	1.09E-01 ≈ (1.45E-02)	-0.01 +	1.13E-01 + (8.48E-03)	0.03 +
NIMS2	9.13E-04 + (3.09E-03)		2.56E-04 + (1.16E-04)		1.89E-04 (3.81E-05)		**1.80E-04 ≈ (2.72E-05)**		2.02E-04 ≈ (5.69E-05)	
NILS1	8.85E-04 + (7.49E-05)	**-0.17 -**	**8.35E-04 ≈ (3.60E-05)**	-0.15 -	8.36E-04 (2.12E-05)	0.00	8.66E-04 ≈ (1.04E-04)	0.23 +	8.41E-04 ≈ (2.61E-05)	-0.03 -
NILS2	**5.13E-01 - (2.37E-01)**		6.02E-01 ≈ (1.49E-01)		6.42E-01 (1.32E-04)		6.42E-01 ≈ (1.88E-06)		6.23E-01 ≈ (1.04E-01)	
≈/+/-	2/14/2	0/7/2	14/3/1	0/6/3	/	/	14/2/2	0/7/2	11/5/2	0/5/4
Rank	4.57		2.41		**2.29**		2.64		3.09	

TABLE A.V
THE MEAN VALUES AND STANDARD DEVIATIONS of IGD and MSS RESULTS OBTAINED BY THE COMPARED VARIANTS IN CEC2019

CEC2019	$a = 1$		$a = 3$		$a = 5$		$a = 7$		$a = 9$	
	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS
CPLX1_1	2.51E-04 ≈ (2.55E-05)	1.10 +	2.51E-04 ≈ (2.58E-05)	0.28 -	2.50E-04 (2.54E-05)	0.33	2.46E-04 ≈ (2.40E-05)	**0.16 +**	**2.45E-04 ≈ (2.11E-05)**	0.19 -
CPLX1_2	4.18E-04 + (7.12E-05)		3.41E-04 ≈ (2.05E-05)		3.46E-04 (2.10E-05)		**3.39E-04 ≈ (1.54E-05)**		3.43E-04 ≈ (2.20E-05)	
CPLX2_1	2.51E-04 ≈ (2.37E-05)	0.53 +	2.53E-04 ≈ (2.53E-05)	0.51 +	2.44E-04 (1.96E-05)	0.22	**2.42E-04 ≈ (2.42E-05)**	**0.10 -**	2.51E-04 ≈ (2.45E-05)	0.61 +
CPLX2_2	7.94E-04 + (1.57E-04)		7.69E-04 + (3.14E-04)		7.17E-04 (2.21E-04)		**6.84E-04 ≈ (2.25E-04)**		8.38E-04 ≈ (2.54E-04)	
CPLX3_1	2.02E-03 + (3.91E-04)	0.64 +	**1.30E-03 - (1.43E-04)**	**-0.36 -**	1.47E-03 (4.21E-04)	-0.17	1.56E-03 ≈ (4.15E-04)	0.08 +	1.62E-03 + (4.03E-04)	0.30 +
CPLX3_2	1.42E-03 ≈ (2.24E-04)		**1.35E-03 ≈ (1.38E-04)**		1.35E-03 (1.95E-04)		1.40E-03 ≈ (1.78E-04)		1.46E-03 + (1.79E-04)	
CPLX4_1	2.06E-03 + (4.44E-04)	1.95 +	1.15E-03 ≈ (1.25E-04)	-0.07 +	**1.14E-03 (2.04E-04)**	**-0.15**	1.22E-03 + (1.06E-04)	0.04 +	1.25E-03 + (1.30E-04)	0.12 +
CPLX4_2	2.02E-03 + (4.81E-04)		1.19E-03 ≈ (1.53E-04)		**1.15E-03 (2.35E-04)**		1.22E-03 + (1.15E-04)		1.26E-03 + (1.12E-04)	
CPLX5_1	1.59E-03 + (2.14E-04)	0.60 +	**1.25E-03 ≈ (1.56E-04)**	**-0.33 -**	1.25E-03 (1.65E-04)	-0.22	1.31E-03 ≈ (1.49E-04)	0.02 +	1.36E-03 + (1.11E-04)	0.08 +
CPLX5_2	5.35E-03 ≈ (7.62E-04)		5.47E-03 ≈ (8.34E-04)		**5.30E-03 (8.13E-04)**		5.44E-03 ≈ (8.52E-04)		5.36E-03 ≈ (8.11E-04)	
CPLX6_1	1.59E-03 ≈ (2.19E-04)	0.47 +	1.53E-03 ≈ (1.66E-04)	-0.08 +	**1.49E-03 (1.92E-04)**	**-0.26**	1.53E-03 ≈ (1.72E-04)	-0.05 +	1.53E-03 ≈ (2.18E-04)	0.13 +
CPLX6_2	2.57E-03 + (5.58E-04)		2.11E-03 ≈ (8.39E-04)		**1.99E-03 (2.90E-04)**		2.12E-03 + (3.63E-04)		2.36E-03 + (6.46E-04)	
CPLX7_1	1.19E-03 + (1.53E-04)	0.58 +	**1.01E-03 ≈ (1.43E-04)**	**-0.12 -**	1.02E-03 (1.59E-04)	-0.09	1.07E-03 ≈ (1.64E-04)	0.03 +	1.09E-03 ≈ (1.59E-04)	0.17 +
CPLX7_2	1.44E-03 ≈ (2.99E-04)		1.34E-03 ≈ (3.25E-04)		1.34E-03 (2.61E-04)		**1.32E-03 ≈ (2.64E-04)**		1.36E-03 ≈ (3.08E-04)	
CPLX8_1	**1.54E-03 ≈ (3.02E-04)**	0.36 +	1.62E-03 ≈ (3.07E-04)	**-0.32 -**	1.66E-03 (2.39E-04)	-0.06	1.73E-03 ≈ (2.56E-04)	0.10 +	1.71E-03 ≈ (2.98E-04)	0.11 +
CPLX8_2	2.34E-03 + (1.74E-03)		**7.66E-04 ≈ (7.77E-04)**		8.15E-04 (8.61E-04)		9.14E-04 ≈ (8.79E-04)		1.01E-03 ≈ (7.93E-04)	
CPLX9_1	**5.06E-03 ≈ (5.90E-04)**	0.52 +	5.26E-03 ≈ (6.18E-04)	**-0.18 -**	5.29E-03 (5.13E-04)	-0.07	5.32E-03 ≈ (6.31E-04)	-0.00 +	5.22E-03 ≈ (5.37E-04)	0.13 +
CPLX9_2	2.89E-03 + (9.34E-04)		**1.80E-03 ≈ (2.91E-04)**		1.91E-03 (2.82E-04)		1.95E-03 ≈ (2.56E-04)		2.23E-03 + (3.05E-04)	
CPLX10_1	5.58E-03 + (2.49E-03)	1.88 +	1.50E-03 ≈ (1.03E-03)	-0.10 +	**1.39E-03 (7.85E-04)**	**-0.19**	1.61E-03 ≈ (1.14E-03)	-0.07 +	1.99E-03 + (1.06E-03)	0.16 +
CPLX10_2	6.80E-03 + (1.61E-03)		2.77E-03 ≈ (1.03E-03)		**2.52E-03 (8.74E-04)**		2.77E-03 ≈ (1.05E-03)		3.33E-03 + (1.13E-03)	
≈/+/-	8/12/0	0/10/0	18/1/1	0/4/6	/	/	17/3/0	0/9/1	11/9/0	0/9/1
Rank	4.14		2.47		**2.37**		2.79		3.23	

TABLE A.VI
THE MEAN VALUES AND STANDARD DEVIATIONS of IGD and MSS RESULTS OBTAINED BY THE COMPARED VARIANTS IN CEC2021

ETMO2021	a = 1		a = 3		a = 5		a = 7		a = 9	
	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS	IGD	MSS
ETMOF1_1	7.28E-04 + (6.91E-05)	1.10 +	**6.52E-04 ≈ (4.20E-05)**	0.38 +	6.52E-04 (5.95E-05)	0.33	6.52E-04 ≈ (7.02E-05)	**0.16 -**	6.71E-04 ≈ (5.66E-05)	0.19 -
ETMOF1_2	1.68E-03 + (1.75E-04)		1.46E-03 ≈ (7.43E-05)		1.41E-03 (1.21E-04)		**1.40E-03 ≈ (1.47E-04)**		1.44E-03 ≈ (1.23E-04)	
ETMOF2_1	6.61E-04 + (9.54E-05)	0.53 +	6.60E-04 + (4.32E-05)	0.51 +	**3.79E-04 (3.56E-05)**	0.22	4.07E-04 + (3.35E-05)	**0.10 -**	4.11E-04 + (6.07E-05)	0.61 +
ETMOF2_2	8.15E-03 + (2.37E-04)		8.18E-03 ≈ (4.32E-04)		7.34E-03 (3.14E-04)		**7.32E-03 ≈ (3.85E-04)**		7.48E-03 ≈ (4.01E-04)	
ETMOF3_1	2.55E-03 + (1.26E-03)	0.64 +	2.12E-03 + (1.71E-03)	-0.06 +	**1.95E-03 (4.05E-04)**	**-0.17**	1.99E-03 ≈ (3.00E-04)	0.08 +	1.99E-03 ≈ (5.58E-04)	0.30 +
ETMOF3_2	2.95E-03 ≈ (5.62E-04)		2.84E-03 ≈ (5.99E-04)		**2.84E-03 (5.18E-04)**		2.88E-03 ≈ (5.86E-04)		2.69E-03 ≈ (4.09E-04)	
ETMOF4_1	3.65E+00 + (1.53E+00)	1.95 +	2.58E+00 ≈ (2.00E+00)	**-0.27 -**	2.78E+00 (2.65E+00)	-0.15	**2.14E+00 ≈ (1.20E+00)**	0.04 +	2.80E+00≈ (2.04E+00)	0.12 +
ETMOF4_2	3.98E-01 + (4.00E-02)		**3.39E-01 ≈ (4.41E-02)**		3.47E-01 (5.89E-02)		3.52E-01 ≈ (4.25E-02)		3.59E-01 ≈ (3.44E-02)	
ETMOF5_1	2.42E-01 ≈ (7.21E-02)	0.60 +	**2.58E-01 ≈ (4.58E-02)**	**-0.33 -**	2.66E-01 (2.68E-03)	-0.22	2.66E-01 ≈ (2.54E-03)	0.02 +	2.67E-01 ≈ (2.26E-03)	0.08 +
ETMOF5_2	4.23E-01 + (1.12E-01)		**2.29E-01 ≈ (2.46E-02)**		2.34E-01 (2.58E-02)		2.46E-01 ≈ (2.95E-02)		2.60E-01 + (4.37E-02)	
ETMOF6_1	1.25E+00 + (1.93E-01)	0.47 +	8.42E-01 + (2.90E-01)	-0.08 +	6.65E-01 (2.01E-01)	**-0.26**	**6.59E-01 ≈ (2.44E-01)**	-0.05 +	6.91E-01 ≈ (1.64E-01)	0.13 +
ETMOF6_2	2.35E-01 + (2.00E-01)		**3.90E-02 ≈ (1.97E-02)**		4.27E-02 (3.41E-02)		5.06E-02 ≈ (3.52E-02)		4.39E-02 ≈ (3.61E-02)	
ETMOF7_1	**1.05E-03 - (2.24E-04)**	**-0.58 -**	1.73E-03 ≈ (5.72E-04)	-0.12 -	1.69E-03 (1.22E-03)	-0.09	1.57E-03 ≈ (6.53E-04)	0.03 +	1.55E-03 ≈ (1.00E-03)	0.17 +
ETMOF7_2	**1.59E-02 - (1.35E-03)**		1.89E-02 ≈ (3.10E-03)		1.87E-02 (6.44E-03)		1.87E-02 ≈ (3.90E-03)		1.92E-02 ≈ (5.51E-03)	
ETMOF7_3	**2.07E-02 ≈ (2.32E-03)**		2.19E-02 ≈ (3.76E-03)		2.18E-02 (3.33E-03)		2.09E-02 ≈ (4.64E-03)		2.05E-02 ≈ (5.31E-03)	
ETMOF8_1	8.85E-03 + (8.93E-04)	0.36 +	**7.50E-03 ≈ (6.90E-04)**	**-0.32 -**	7.58E-03 (8.01E-04)	-0.06	7.48E-03 ≈ (6.64E-04)	0.10 +	7.73E-03 ≈ (6.97E-04)	0.11 +
ETMOF8_2	2.75E-03 + (5.51E-04)		1.96E-03 ≈ (2.08E-04)		1.99E-03 (2.00E-04)		**1.93E-03 ≈ (2.22E-04)**		2.04E-03 ≈ (3.19E-04)	
ETMOF8_3	1.55E-03 + (1.90E-04)		**1.29E-03 ≈ (6.22E-05)**		1.29E-03 (8.99E-05)		1.29E-03 ≈ (7.82E-05)		1.33E-03 ≈ (9.04E-05)	
≈/+/-	3/13/2	0/7/1	15/0/1	0/4/4	/	/	17/1/0	0/6/2	16/2/0	0/7/1
Rank	4.17		2.69		**2.44**		2.76		2.84	