

TABLE I

THE IGD⁺ RESULTS OF NTSPEA, RMNSGAI, RTEA, Two_ARCH2 AND TSEA ON THE DTLZ PROBLEMS. THE BEST RESULT IN EACH PROBLEM IS MARKED. THE SYMBOLS “+”, “-” AND “≈” INDICATE THAT THE COMPARED ALGORITHM IS STATISTICALLY SIGNIFICANTLY SUPERIOR TO, INFERIOR TO, AND ALMOST EQUIVALENT TO TSEA, RESPECTIVELY (THE SIGNIFICANCE LEVEL IS 0.05).

Problems	σ	NTSPEA	RMNSGAI	RTEA	Two_Arch2	TSEA
WFG1	0.1	1.29e+00 (5.02e-03) -	1.30e+00 (1.32e-02) -	1.29e+00 (1.12e-02) -	1.31e+00 (1.45e-02) -	1.29e+00 (1.69e-02)
	0.2	7.92e-01 (5.30e-01) +	8.11e-01 (5.63e-01) +	8.44e-01 (5.64e-01) +	8.87e-01 (5.98e-01) +	1.30e+00 (9.14e-03)
	0.5	1.35e+00 (1.74e-01) ≈	1.69e+00 (2.57e-01) -	1.36e+00 (3.34e-01) ≈	1.81e+00 (1.87e-01) -	1.34e+00 (3.08e-01)
WFG2	0.1	1.90e-01 (2.64e-02) -	2.56e-01 (3.61e-02) -	2.12e-01 (4.03e-02) -	2.49e-01 (4.13e-02) -	1.40e-01 (2.08e-02)
	0.2	3.04e-01 (6.30e-02) -	3.34e-01 (5.09e-02) -	2.97e-01 (3.89e-02) -	3.64e-01 (4.20e-02) -	2.23e-01 (2.86e-02)
	0.5	4.58e-01 (4.28e-02) ≈	4.63e-01 (5.27e-02) ≈	4.22e-01 (4.25e-02) ≈	5.78e-01 (5.62e-02) -	4.10e-01 (1.13e-01)
WFG3	0.1	1.97e-01 (2.46e-02) -	2.60e-01 (3.34e-02) -	2.02e-01 (3.42e-02) -	2.78e-01 (3.78e-02) -	1.58e-01 (2.18e-02)
	0.2	3.50e-01 (5.65e-02) -	3.34e-01 (3.49e-02) -	3.01e-01 (3.18e-02) -	4.46e-01 (6.14e-02) -	2.38e-01 (3.19e-02)
	0.5	5.43e-01 (2.95e-02) ≈	4.99e-01 (5.02e-02) ≈	4.72e-01 (4.66e-02) ≈	6.74e-01 (4.51e-02) -	5.11e-01 (1.32e-01)
WFG4	0.1	1.28e-01 (1.10e-02) -	1.60e-01 (1.16e-02) -	1.16e-01 (1.38e-02) -	1.79e-01 (1.66e-02) -	1.04e-01 (6.26e-03)
	0.2	2.21e-01 (3.43e-02) -	2.19e-01 (1.78e-02) -	1.73e-01 (1.66e-02) -	2.79e-01 (2.45e-02) -	1.58e-01 (1.10e-02)
	0.5	3.45e-01 (3.64e-02) -	3.23e-01 (4.07e-02) -	2.96e-01 (2.84e-02) ≈	4.80e-01 (3.50e-02) -	2.87e-01 (8.31e-02)
WFG5	0.1	1.61e-01 (1.36e-02) -	2.63e-01 (2.75e-02) -	1.72e-01 (2.06e-02) -	2.41e-01 (2.53e-02) -	1.27e-01 (7.29e-03)
	0.2	2.86e-01 (6.13e-02) -	4.17e-01 (3.96e-02) -	2.67e-01 (3.58e-02) -	3.88e-01 (2.59e-02) -	1.89e-01 (1.59e-02)
	0.5	4.59e-01 (4.31e-02) -	6.00e-01 (3.59e-02) -	4.45e-01 (4.26e-02) ≈	6.28e-01 (3.60e-02) -	3.98e-01 (9.82e-02)
WFG6	0.1	1.75e-01 (1.96e-02) -	2.35e-01 (3.34e-02) -	1.61e-01 (1.75e-02) -	2.55e-01 (4.17e-02) -	1.49e-01 (9.62e-03)
	0.2	3.20e-01 (6.39e-02) -	3.65e-01 (4.04e-02) -	2.74e-01 (2.92e-02) -	4.12e-01 (4.89e-02) -	2.15e-01 (1.75e-02)
	0.5	5.53e-01 (4.98e-02) ≈	5.82e-01 (6.58e-02) -	4.80e-01 (5.48e-02) ≈	6.85e-01 (4.69e-02) -	5.05e-01 (1.15e-01)
WFG7	0.1	1.23e-01 (1.51e-02) -	1.83e-01 (3.53e-02) -	1.39e-01 (1.69e-02) -	1.88e-01 (3.15e-02) -	8.90e-02 (8.34e-03)
	0.2	2.96e-01 (6.00e-02) -	2.98e-01 (3.35e-02) -	2.07e-01 (4.15e-02) -	3.52e-01 (3.74e-02) -	1.48e-01 (2.20e-02)
	0.5	4.33e-01 (4.00e-02) -	4.47e-01 (4.80e-02) -	4.05e-01 (4.36e-02) -	5.71e-01 (4.43e-02) -	3.48e-01 (9.76e-02)
WFG8	0.1	2.16e-01 (1.61e-02) -	2.87e-01 (1.99e-02) -	2.33e-01 (3.01e-02) -	2.80e-01 (2.30e-02) -	1.94e-01 (1.52e-02)
	0.2	3.58e-01 (5.04e-02) -	3.59e-01 (3.14e-02) -	3.08e-01 (2.81e-02) -	4.10e-01 (2.59e-02) -	2.49e-01 (1.61e-02)
	0.5	4.87e-01 (3.90e-02) +	5.01e-01 (4.69e-02) +	4.70e-01 (4.68e-02) +	6.39e-01 (3.46e-02) ≈	4.81e-01 (1.58e-01)
WFG9	0.1	1.17e-01 (1.86e-02) -	1.82e-01 (3.41e-02) -	1.37e-01 (3.00e-02) -	1.80e-01 (3.81e-02) -	1.07e-01 (1.22e-02)
	0.2	2.19e-01 (6.48e-02) -	2.60e-01 (5.17e-02) -	2.20e-01 (6.36e-02) -	2.33e-01 (6.66e-02) -	1.52e-01 (3.16e-02)
	0.5	3.69e-01 (1.01e-01) -	4.00e-01 (8.18e-02) -	3.73e-01 (8.56e-02) -	5.76e-01 (7.34e-02) -	2.32e-01 (8.56e-02)
Average Rank		2.74	3.96	2.26	4.74	1.3
+ / ≈ / -		2/4/21	2/2/23	2/6/19	1/1/25	