| | reduction cans (speed apself, speed apmodel) | | |
|------------------------|----------------------------------------------|----------------------------------|----------------|
| Test functions | (1 + 1)-ES | (3/3, 10)-ES (5/5, 20)-ES | (10/10, 40)-ES |
| linear sphere | 502 | 367(9.0, 1.4) 316(15.1, 1.6) | 321(26.3, 1.6) |
| quadratic sphere | 212 | 211(8.0, 1.0) 164(14.9, 1.3) | 146(29.0, 1.5) |
| cubic sphere | 202 | $213(5.5, 0.96) \ 176(9.4, 1.3)$ | 178(15.8, 1.4) |
| Calarra Calla Comatian | 1500 | 0070(0 0 0 70) 1055((0 1 1) | 1051(10 5 1 1) |

Median number of objective function calls (speed-up 10 speed-up 11)

796(18.4, 1.6)

2070(3.0, 0.73) 1355(6.0, 1.1) 1051(12.7, 1.4)

1511(4.4, 0.83) 1016(8.3, 1.3)

Note: the values shown for the (1+1)-ES are results for the (1+1)-ES with surrogate model assistance.

1503 Schwefel's function

1250

quartic function