Benchmarking the (1+1)-CMA-ES on the BBOB-2009 Noisy Testbed

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ABSTRACT

We benchmark an independent-restart-(1+1)-CMA-ES on the BBOB-2009 noisy testbed. The (1+1)-CMA-ES is an adaptive stochastic algorithm for the optimization of objective functions defined on a continuous search space in a black-box scenario. The maximum number of function evaluations used here equals 10^4 times the dimension of the search space. The algorithm could only solve 4 functions with moderate noise in 5-D and 2 functions in 20-D.

Categories and Subject Descriptors

G.1.6 [Numerical Analysis]: Optimization—global optimization, unconstrained optimization; F.2.1 [Analysis of Algorithms and Problem Complexity]: Numerical Algorithms and Problems

General Terms

Algorithms

Keywords

Benchmarking, Black-box optimization, Evolutionary computation, CMA-ES

1. INTRODUCTION

The (1+1)-CMA-ES is an adaptive stochastic search algorithm combining the simple (1+1) selection scheme and the famous covariance matrix adaptation (CMA) mechanism [6]. This paper complements [1] where an independent-restart implementation of the (1+1)-CMA-ES is benchmarked on the BBOB-2009 noise-free testbed. Indeed we test exactly the same algorithm, using the same settings on the BBOB-2009 noisy testbed. For the description of the algorithm and the settings we refer to [1].

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2. RESULTS AND DISCUSSION

Results from experiments according to [4] on the benchmark functions given in [2, 5] are presented in Figures 1 and 2 and in Tables 1 and 2.

We observe that globally the algorithm performs poorly. In 5-D, only f_{101} , f_{102} , f_{103} , f_{104} are solved and in 20-D only f_{101} and f_{102} are solved. The functions solved belong to the class of functions with moderate noise. In comparison with the BI-population CMA-ES in [3], a restart algorithm using the $(\mu/\mu_W, \lambda)$ -CMA, the overall performance is poor. The (1+1) selection is an inferior choice for noisy optimization, because of the elitist selection and the lack of population. However, reevaluation of the parental solution and more allowed function evaluations might still leave some room for improvement.

Acknowledgments

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3. REFERENCES

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Figure 1: Expected Running Time (ERT, •) to reach $f_{opt} + \Delta f$ and median number of function evaluations of successful trials (+), shown for $\Delta f = 10, 1, 10^{-1}, 10^{-2}, 10^{-3}, 10^{-5}, 10^{-8}$ (the exponent is given in the legend of f_{101} and f_{130}) versus dimension in log-log presentation. The ERT(Δf) equals to $\#FEs(\Delta f)$ divided by the number of successful trials, where a trial is successful if $f_{opt} + \Delta f$ was surpassed during the trial. The $\#FEs(\Delta f)$ are the total number of function evaluations while $f_{opt} + \Delta f$ was not surpassed during the trial from all respective trials (successful and unsuccessful), and f_{opt} denotes the optimal function value. Crosses (×) indicate the total number of successful trials. Annotated numbers on the ordinate are decimal logarithms. Additional grid lines show linear and quadratic scaling.

| | f101 in 5-D, N=15, mFE=499 | 9 f101 in 20-D, N=15, mFE | =2020 | f102 in 5-
 | D , N=15, m | FE=492 | f102 in 2

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| Λf | f_{111} in 5-D, N=15, mFE=50001 | f111 in 20-D, N=15, mFE=2 | 200001
A f | f112 in 5-
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 | D, N=15, m | FE=50001 | f112 in

 | n 20-D, | N=15,
 | mFE=200001 | | | | | | | | | | | | | | |
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| Δf
10 | f_{111} in 5-D, N=15, mFE=50001
ERT 10% 90% RT _{succ}
1 7.2e5 3.5e5 >7e5 2.0e4 | f_{111} in 20-D, N=15, mFE=2
ERT 10% 90% RT _s
0 44e+3 26e+3 73e+3 1.3 | $\begin{array}{c} 200001\\ \underline{ucc} & \Delta f\\ \overline{uc5} & 10 \end{array}$ | f112 in 5-
ERT
15 3.5e2 2
 | D, N=15, m
10% 90%
2.0e2 5.1e2 | FE=50001
RT_{succ}
3.5 e2 | f112 in
ERT
0 20e+

 | n 20-D,
$\Gamma = 10\%$
0 = 14e + 10 | N=15,
90%
0 23e+0
 | mFE=200001
RT_{succ}
1.1e5 | | | | | | | | | | | | | | |
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| $\frac{\Delta f}{10}$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | $\frac{200001}{10}$ | f112 in 5-
ERT
15 3.5e2 2
15 1.1e4 8
 | D, N=15, m
10% 90%
2.0e2 5.1e2
3.2e3 1.5e4 | FE=50001
RT_{succ}
3.5e2
1.1e4 | f112 in
ERT
0 20e+

 | n 20-D,
10%
0 14e+ | $N=15, \\ 90\% \\ 0 23e+0 \\ .$
 | $\frac{\text{mFE}=200001}{\text{RT}_{\text{succ}}}$ 1.1 e5 | | | | | | | | | | | | | | |
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| $\frac{\Delta f}{10}$
1
1e-1 | $\begin{array}{c} f{111 \ in \ 5-D, \ N=15, \ mFE=50001} \\ \# \ ERT \ 10\% \ 90\% \ RT_{Succ} \\ 1 \ 7.2e5 \ 3.5e5 \ >7e5 \ 2.0e4 \\ 0 \ 44e+0 \ 12e+0 \ 96e+0 \ 2.0e4 \end{array}$ | | $\frac{\Delta f}{10}$ $\frac{\Delta f}{1}$ $\frac{1}{1e-1}$ $\frac{1}{1e-2}$ | f112 in 5-
ERT
15 3.5e2 2
15 1.1e4 8
2 3.5e5 1
 | D, N=15, m
10% 90%
2.0e2 5.1e2
3.2e3 1.5e4
1.8e5 > 7e5 | $\begin{array}{r} \text{FE} = 50001 \\ \text{RT}_{\text{succ}} \\ \hline 3.5 \text{ e2} \\ 1.1 \text{ e4} \\ 4.3 \text{ e4} \\ 1.8 \text{ e4} \end{array}$ | f112 in
ERT
0 20e+

 | n 20-D,
F 10%
0 14e+ | N=15, 90%
0 23e+0
 | mFE=200001
RT _{succ}
1.1e5 | | | | | | | | | | | | | | |
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| Δf
10
1
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1e-5 | $\begin{array}{cccccc} f111 \text{ in } 5\text{-D}, \mathrm{N}{=}15, \mathrm{mFE}{=}50001 \\ \# \ \mathrm{ERT} & 10\% & 90\% & \mathrm{RT}_{\mathrm{Succ}} \\ 1 & 7.2 \mathrm{e5} & 3.5 \mathrm{e5} & >7 \mathrm{e5} & 2.0 \mathrm{e4} \\ 0 & 44 \mathrm{e}{+}0 & 12 \mathrm{e}{+}0 & 96 \mathrm{e}{+}0 & 2.0 \mathrm{e4} \\ & & & & & & \\ & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ \end{array}$ | $ \begin{array}{c} f{111 in 20-D, N=15, mFE=2} \\ \# \ ERT \ 10\% \ 90\% \ RT_{g} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$ | $\begin{array}{c} 200001 \\ \underline{ucc} \\ \underline{bc} \\ \underline{bc} \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \end{array}$ | f112 in 5-
ERT
15 3.5e2 2
15 1.1e4 8
2 3.5e5 1
0 29e-2 9
 | D, N=15, m
10% 90%
2.0e2 5.1e2
3.2e3 1.5e4
1.8e5 >7e5
94e-3 52e-2 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ \end{array}$ | f112 in
ERT
0 20e+

 | n 20-D,
<u>F 10%</u>
0 14e+ | N=15, 90%
0 23e+0
 | mFE=200001
RT _{succ}
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| $\frac{\Delta f}{10}$
1 1
1 e-1
1 e-3
1 e-5
1 e-8 | $\begin{array}{cccccc} f111 \text{ in } 5\text{-}\mathrm{D}, \mathrm{N}{=}15, \mathrm{mFE}{=}50001 \\ \# \ \mathrm{ERT} & 10\% & 90\% & \mathrm{RT}_{\mathrm{succ}} \\ 1 & 7.2\mathrm{e5} & 3.5\mathrm{e5} & 5.7\mathrm{e5} & 2.0\mathrm{e4} \\ 0 & 44\mathrm{e}{+}0 & 12\mathrm{e}{+}0 & 96\mathrm{e}{+}0 & 2.0\mathrm{e4} \\ & & & & & \\ & & & & & & \\ & & & & & $ | $ \begin{array}{c} f111 \text{ in } 20\text{-}D, \ \mathrm{N=15}, \ \mathrm{mFE=2}\\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{S}}\\ 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ & & & & \\ & & & \\ & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & &$ | $\begin{array}{c} 200001 \\ \underline{ucc} \\ e5 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \end{array}$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \text{ ERT} \\ 15 3.5 \text{ e2 } 2\\ 15 1.1 \text{ e4 } 8\\ 2 3.5 \text{ e5 } 1\\ 0 29e-2 9\\ \vdots \\ \vdots \\ \end{array}$
 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \hline 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ \vdots\\ \end{array}$ | f112 in
ERT
0 20e+

 | n 20-D,
<u>5 10%</u>
0 14e+ | N=15,
90%
0 23e+0
 | mFE=200001
RT _{succ}
1.1e5 | | | | | | | | | | | | | | |
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| $\frac{\Delta f}{10}$
1
1e-1
1e-3
1e-5
1e-8 | $ \begin{array}{c} f_{111} \text{ in } 5\text{-D}, \mathrm{N}{=}15, \mathrm{mFE}{=}50001 \\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{Succ}} \\ 1 \ 7.2e5 \ 5.5e5 \ 7.7e5 \ 2.0e4 \\ 0 \ 44e{+}0 \ 12e{+}0 \ 96e{+}0 \ 2.0e4 \\ . \ . \ . \ . \ . \ . \ . \ . \ . \ .$ | $\begin{array}{c} f111 \text{ in } 20\text{-}\text{D}, \text{ N}=15, \text{ mFE}=2\\ \# \text{ ERT } 10\% 90\% \text{ RT}_{\text{S}}\\ 0 44e+3 26e+3 73e+3 1.3\\ \vdots\\ \vdots\\ f113 \text{ in } 20\text{-}\text{D}, \text{ N}=15, \text{ mFE}=2 \end{array}$ | $\begin{array}{c} 200001 \\ \underline{\text{ucc}} & \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ -1 \\ 1 \\ 1 \\ -3 \\ 1 \\ -5 \\ 1 \\ -8 \end{array}$ | f112 in 5-
ERT
15 3.5e2 2
15 1.1e4 8
2 3.5e5 1
0 29e-2 9
f114 in 5-
 | $\begin{array}{cccc} \mathbf{D}, \ \mathbf{N}{=}15, \ \mathbf{m} \\ 10\% & 90\% \\ 2.0e2 & 5.1e2 \\ 3.2e3 & 1.5e4 \\ 1.8e5 & >7e5 \\ 94e{-}3 & 52e{-}2 \\ & & & \\ & & & \\ & & & \\ \mathbf{D}, \ \mathbf{N}{=}15, \ \mathbf{m} \end{array}$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \hline 3.5{\rm e}2\\ 1.1{\rm e}4\\ 4.3{\rm e}4\\ 1.8{\rm e}4\\ \hline \\ {\rm .}\\ {\rm FE}{=}50001 \end{array}$ | f112 in
ERT
0 20e+

f114 in

 | n 20-D,
$\frac{10\%}{14e+1}$
n 20-D, | N=15, 90% 0 23e+0
 | mFE=200001
RT _{succ}
1.1e5
mFE=200001 | | | | | | | | | | | | | | |
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Δf | $ \begin{array}{c} f_{111} \text{ in } 5\text{-D}, \mathrm{N}{=}15, \mathrm{mFE}{=}50001 \\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{succ}} \\ 1 \ 7.2e5 \ 3.5e5 \ 5.7e5 \ 2.0e4 \\ 0 \ 44e+0 \ 12e+0 \ 96e+0 \ 2.0e4 \\ \vdots \ \vdots$ | $\begin{array}{c} f111 \text{ in } 20\text{-}\text{D}, \text{ N}=15, \text{ mFE}=2\\ \# \text{ ERT } 10\% 90\% \text{ RT}_{\text{S}}\\ 0 44e+3 26e+3 73e+3 1.3\\ \vdots\\ \vdots\\ f113 \text{ in } 20\text{-}\text{D}, \text{ N}=15, \text{ mFE}=2\\ \# \text{ ERT } 10\% 90\% \text{ RT}_{\text{S}}\\ \end{array}$ | $\begin{array}{c} 200001 \\ \underline{ucc} \\ e5 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 200001 \\ \underline{ucc} \\ 20 \\ 20 \\ 20 \\ 20 \\ 10 \\ 10 \\ 10 \\ 10$ | $ \begin{array}{c} f_{112} \text{ in } 5 \\ \# \text{ ERT} \\ 15 & 3.5 \text{ e}2 & 2 \\ 15 & 1.1 \text{ e}4 & 8 \\ 2 & 3.5 \text{ e}5 & 1 \\ 0 & 29e - 2 & 9 \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & &
\\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\$ | D, N=15, m 10% 90% 2.0e2 5.1e2 3.2e3 1.5e4 1.8e5 >7e5 94e-3 52e-2 . . . < | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ \\ \\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \end{array}$ | f112 in
ERT
0 20e+

f114 in
ERT

 | n 20-D ,
f = 10%
0 = 14e + 10%
n 20-D ,
f = 10% | N=15,
90%
0 23e+0
 | $\begin{array}{c} {\rm mFE}{=}200001 \\ {\rm RT}_{\rm succ} \\ \hline 1.1{\rm e5} \\ & \cdot \\ & \cdot \\ {\rm mFE}{=}200001 \\ {\rm RT}_{\rm succ} \\ {\rm RT}_{\rm succ} \end{array}$ | | | | | | | | | | | | | | |
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| $ \begin{array}{r} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \underline{\Delta f} \\ 10 \\ 1 \end{array} $ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} \frac{\Delta f}{100001} \\ \frac{1}{100001} \\ \frac{\Delta f}{100001} \\ \frac{1}{100001} \\ \frac{1}{1000001} \\ \frac{1}{1000001} \\ \frac{1}{10000000000000000000000000000000000$ | f112 in 5-
ERT
15 3.5e2 2
15 1.1e4 8
2 3.5e5 1
0 29e-2 9
f114 in 5-
ERT
15 5.5e3 4
2 3.5e5 1
 | D, N=15, m 10% 90% 2.0e2 5.1e2 3.2e3 1.5e4 8e5 >7e5 94e-3 52e-2 . . . <t< td=""><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \hline 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ & \cdot\\ \\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \hline 5.5e3\\ 5.0e4 \end{array}$</td><td>f112 in
ERT
0 20e+

f114 in
ERT
0 34e+</td><td>n 20-D,
$\Gamma = 10\%$
0 = 14e + 14e</td><td>$\begin{array}{c} N=15, \\ 90\% \\ 0 \ 23e+0 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$</td><td>$\begin{array}{c} mFE{=}200001 \\ \hline RT_{SUCC} \\ \hline 1.1e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$</td></t<> | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \hline 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ & \cdot\\ \\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ \hline 5.5e3\\ 5.0e4 \end{array}$ | f112 in
ERT
0 20e+

f114 in
ERT
0 34e+

 | n 20-D,
$\Gamma = 10\%$
0 = 14e + 14e | $\begin{array}{c} N=15, \\ 90\% \\ 0 \ 23e+0 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | $\begin{array}{c} mFE{=}200001 \\ \hline RT_{SUCC} \\ \hline 1.1e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} \frac{\Delta f}{10} \\ \frac{ucc}{e5} & \frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 000001 \\ \frac{ucc}{e5} & \frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-1 \end{array}$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \text{ERT} \\ 15 3.5e2 2\\ 15 1.1e4 8\\ 2 3.5e5 1\\ 0 29e-2 9\\ \cdot \\ \cdot \\ f114 \text{in } 5-\\ \# \text{ERT} \\ 15 5.5e3 4\\ 2 3.5e5 1\\
0 29e-1 0 \end{array}$ | $ \begin{array}{rrrr} \mathbf{D}, \ \mathbf{N} \!=\! 15, \ \mathbf{m} \\ 10\% & 90\% \\ 2.0e2 & 5.1e2 \\ 3.2e3 & 1.5e4 \\ 1.8e5 & >7e5 \\ 94e-3 & 52e-2 \\ & & & \\ & & & \\ \mathbf{D}, \ \mathbf{N} \!=\! 15, \ \mathbf{m} \\ 10\% & 90\% \\ 1.1e3 & 7.0e3 \\ 1.8e5 & >7e5 \\ 73e-2 & 40e-1 \\ \end{array} $ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4 \end{array}$ | f112 in
ERT
0 20e+

f114 in
ERT
0 34e+

 | n 20-D,
$\Gamma = 10\%$
0 = 14e + 10%
14e + 10%
$\Gamma = 10\%$
1 = 23e + 10% | $\begin{array}{c} N=15, \\ 90\% \\ 0 \ 23e+0 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $
 | $\begin{array}{c} {\rm mFE}{=}200001\\ {\rm RT}_{\rm succ}\\ \hline 1.1e5\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | | | | | | | | | | | | | | |
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| $\frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-3 \\ 1a \\ 5e-1 \\ 1a \\ 1a \\ 5e-1 \\ 1a \\ $ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} & \Delta f \\ \frac{ucc}{e5} & \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 00001 \\ \frac{ucc}{e5} & \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-5}$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT}\\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \vdots\\ f114 \ \text{in } 5-\\ f114 \ \text{in } 5-\\ f115 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 7\\ \end{array}$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ .\\ \end{array}$ | f112 in
ERT
0 20e+

f114 in
ERT
0 34e+

 | n 20-D, | $\begin{array}{c} N=15, \\ 90\% \\ \hline 0 & 23e+0 \\ \vdots \\ \vdots \\ N=15, \\ 90\% \\ \hline 1 & 57e+1 \\ \vdots \\ \vdots \\ \end{array}$ | $\begin{array}{c} {\rm mFE}{=}200001\\ {\rm RT}_{{\rm SUCC}}\\ \hline 1.1e5\\ {\rm mFE}{=}200001\\ {\rm RT}_{{\rm SUCC}}\\ \hline 1.0e5\\ \end{array}$
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} & \Delta f \\ \frac{ucc}{e5} & \Delta f \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-3} \\ 1e^{-8} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT}\\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \vdots\\ f114 \ \text{in } 5-\\ \# \ \text{ERT}\\ 15 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 7\\ \vdots\\ \vdots\\$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5\ e2\\ 1.1\ e4\\ 4.3\ e4\\ 1.8\ e4\\ 1.8\ e4\\ 1.8\ e4\\ 1.8\ e4\\ 1.8\ e4\\ 2.0\ e4\\$ | f112 in
ERT
0 20e+

f114 in
ERT
0 34e+

 | n 20-D,
5 10%
0 14e+ | $\begin{array}{c} N{=}15, \\ 90\% \\ 0 \ 23e{+}0 \\ \vdots \\ \vdots \\ N{=}15, \\ 90\% \\ 1 \ 57e{+}1 \\ \vdots \\ $ | $\begin{array}{c} mFE{=}200001 \\ \hline RT_{SUCC} \\ \hline 1.1e5 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ \hline RT_{SUCC} \\ \hline 1.0e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} f111 \text{ in } 20\text{-}\text{D}, \text{ N=15}, \text{ mFE=2}\\ \# \text{ ERT } 10\% 90\% \text{ RT}_{\text{S}}\\ 0 44e+3 26e+3 73e+3 1.3\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $ \begin{array}{c} \frac{\Delta f}{10} \\ \frac{ucc}{e5} \\ \frac{\Delta f}{10} \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \frac{ucc}{10} \\ \frac{\Delta f}{10} \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 200001 \\ \end{array} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ ERT \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ f114 \ \text{in } 5-\\ \# \ ERT \\ 15 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \
29e-1 \ 7\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\ .\\ {\rm FE}{=}50001\\ \end{array}$ | $\begin{array}{c} f_{112} \text{ in }\\ \# \text{ ERT}\\ 0 & 20e^{+}\\ \cdot & \cdot\\ f_{114} \text{ in }\\ \# \text{ ERT}\\ 0 & 34e^{+}\\ \cdot & \cdot\\ f_{116} \text{ in }\\ \end{array}$

 | n 20-D,
$\Gamma = 10\%$
0 = 14e + | $\begin{array}{c} N{=}15, \\ 90\% \\ \hline 0 & 23e{+}0 \\ \hline & . \\ N{=}15, \\ 90\% \\ \hline 1 & 57e{+}1 \\ \hline & . \\ N{=}15, \\ N{=}15, \end{array}$
 | $\begin{array}{c} mFE{=}200001 \\ \hline RT_{SUCC} \\ \hline 1.1e5 \\ . \\ . \\ . \\ mFE{=}200001 \\ \hline RT_{SUCC} \\ \hline 1.0e5 \\ . \\ . \\ . \\ . \\ . \\ mFE{=}200001 \end{array}$ | | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ \end{array}$ | $ \begin{array}{ccccccc} f111 \text{ in } 5\text{-D}, \mathbb{N} = 15, \mathrm{mFE} = 50001 \\ \# \ \mathrm{ERT} & 10\% & 90\% & \mathrm{RT}_{\mathrm{Succ}} \\ 17.2 \mathrm{efs} & 3.5 \mathrm{efs} & 7.\mathrm{efs} & 2.0 \mathrm{e4} \\ 0 & 44e + 0 & 12e + 0 & 96e + 0 & 2.0 \mathrm{e4} \\ & & & & & & & & \\ & & & & & & & & \\ 113 & \mathrm{in} & 5\text{-D}, \mathbb{N} = 15, \mathrm{mFE} = 50001 \\ \# \ \mathrm{ERT} & 10\% & 90\% & \mathrm{RT}_{\mathrm{Succ}} \\ 15 & 1.1 \mathrm{e3} & 6.0 \mathrm{e2} & 1.8 \mathrm{e3} & 1.1 \mathrm{e3} \\ 8 & 7.0 \mathrm{e4} & 5.7 \mathrm{e4} & 1.1 \mathrm{e5} & 4.2 \mathrm{e4} \\ 1 & 7.5 \mathrm{e5} & 3.7 \mathrm{e5} & 7.\mathrm{e5} & 5.0 \mathrm{e4} \\ 0 & 96e - 2 & 12e - 2 & 17e - 1 & 3.2 \mathrm{e4} \\ & & & & & & \\ & & & & & & & \\ 115 & \mathrm{in} & 5\text{-D}, \mathbb{N} = 15, \mathrm{mFE} = 50001 \\ \# \ \mathrm{ERT} & 10\% & 90\% & \mathrm{RT}_{\mathrm{Succ}} \end{array} $ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} & \Delta f \\ \frac{ucc}{10} & \Delta f \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-1} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \cdot \\ \cdot \\ + \ \text{ERT} \\ 15 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 7\\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ + \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot $
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ} \end{array}$ | f112 in
ER1
0 20e+

f114 in
ER1
0 34e+

f116 in
ER1

 | n 20-D,
5 10%
0 14e+
n 20-D,
5 10%
1 23e+ | $\begin{array}{c} N{=}15,\\ 90\%\\ \hline 0.23e{+}0\\ \hline .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\$ | mFE=200001
<u>RTsucc</u>
1.1e5
mFE=200001
<u>RTsucc</u>
1.0e5
mFE=200001
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| $\frac{\Delta f}{10} \\ \frac{1}{1e-1} \\ \frac{1}{1e-3} \\ \frac{1}{1e-5} \\ \frac{1}{1e-8} \\ \frac{\Delta f}{1} \\ \frac{1}{1e-1} \\ \frac{1}{1e-5} \\ \frac{1}{1e-8} \\ \frac{\Delta f}{10} \\ \frac{1}{10} \\ \frac$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} \frac{\Delta f}{10} \\ \frac{1}{1e^{-5}} \\ \frac{\Delta f}{10} \\ \frac{1}{1e^{-1}} \\ \frac{1}{1e^{-3}} \\ \frac{1}{1e^{-5}} \\ \frac{1}{1e^{-8}} \\ \frac{1}{1e^{-8}} \\ \frac{1}{1e^{-8}} \\ \frac{1}{1e^{-5}} \\ \frac{1}{10} \\ \frac{1}{1e^{-5}} \\ \frac{1}{1e^$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $ \begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\.\\{\rm FE}{=}500011\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ \end{array}$ | f112 in
ER1
0 20e+

f114 in
ER1
0 34e+

f116 in
ER1
0 16e+

 | n 20-D,
5 10%
0 14e+
n 20-D,
5 10%
1 23e+
 | $\begin{array}{c} N{=}15,\\ 90\%\\ 0&23e{+}0\\ & \\ \end{array}$ $\begin{array}{c} N{=}15,\\ 90\%\\ 1&57e{+}1\\ \\ \\ \end{array}$ $\begin{array}{c} N{=}15,\\ 90\%\\ 2&21e{+}3\\ \end{array}$ | $\begin{array}{c} {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{1.1e5} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{mFE=200001} \\ {}_{$ | | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} & \Delta f \\ \frac{ucc}{e5} & \Delta f \\ 1 \\ 1 \\ e-1 \\ 1e-3 \\ 1e-5 \\ e-8 \\ 00001 \\ \frac{ucc}{e5} & \Delta f \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 00001 \\ \frac{ucc}{e5} & \Delta f \\ 1e-1 \\ 1e-3 \\ 1e-8 \\ 1e-1 \\$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5 \text{ e} 2 \ 2\\ 15 \ 1.1 \text{ e} 4 \ \text{ B} \text{ RT} \\ 2 \ 3.5 \text{ e} 5 \ 1\\ 0 \ 29 \text{ e} - 2 \ 2\\ \cdot\\ \cdot\\ f114 \ \text{ in } 5-\\ \# \ \text{ERT} \\ 2 \ 3.5 \text{ e} 5 \ 1\\ 0 \ 29 \text{ e} - 1 \ 2\\ \cdot\\ \cdot\\ \cdot\\ f116 \ \text{ in } 5-\\ \# \ \text{ERT} \\ 3 \ 2.1 \text{ e} 5 \ 1\\ 0 \ 18 \text{ e} 70 \ 4\\ 0 \ 18 \text{ e} - 4 \ 4\\ \end{array}$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\ {\rm RT}_{\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ \end{array}$ | $ \begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ER1} \\ 0 \ 20e+ \\ \cdot \\ $

 | n 20-D,
$\Gamma = 10\%$
0 = 14e +
$\cdot =$
n 20-D,
$\Gamma = 10\%$
1 = 23e +
$\cdot =$
$\cdot =$ | $\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ {\rm 0}\ {\rm 23e+0}\\ {\rm 0}\ {\rm 23e+0}\\ {\rm 0}\ {\rm 13e+0}\\ {\rm 0}\ {\rm 115,}\\ {\rm 90\%}\\ {\rm 1}\ {\rm 57e+1}\\ {\rm .}\\ {\rm $ | $\begin{array}{c} {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{1.1e5}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {}_{.}\\ {$ | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \end{array} \\ \begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \end{array} \\ \begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} f111 \mbox{ in 20-D, N=15, mFE=2} \\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ \hline . \ . \ . \ . \ . \ . \ . \ . \ . \ .$ | $\begin{array}{c} & \Delta f \\ \frac{ucc}{e5} & \Delta f \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm Succ}\\ 3.5e2\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm Succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ 2.0e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm Succ}\\ 2.4e4\\ 3.2e4\\ .\\ .\\ \end{array}$ | f112 in
ERT
0 20e+

f114 in
ERT
0 34e+

f116 in
ERT
0 16e+

 | n 20-D,
Γ 10%
0 14e+

n 20-D,
Γ 10%
1 23e+

n 20-D,
Γ 10%
3 99e+
 | $\begin{array}{c} N{=}15,\\ 90\%\\ 9\ 23e{+}0\\ \hline \\ 0\ 23e{+}0\\ \hline \\ 0\ 23e{+}0\\ \hline \\ 0\ 32e{+}0\\ \hline 0\ 32e{+}0\\ \hline \\ 0\ 32e{+}0\\ \hline \\ 0\ 32e{+}0\\ \hline 0\ 32e{+}0\ 32e{+}0\\ \hline 0\ 32e{+}0\ 1\ 0\ 32e{+}0\\ \hline$ | $\begin{array}{c} {\rm mFE}{=}200001 \\ {\rm RT}_{\rm SUCC} \\ 1.1e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ {\rm RT}_{\rm SUCC} \\ 1.0e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-5 \\ 1e-8 \\ \hline \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} & \Delta f \\ \frac{ucc}{e5} & \Delta f \\ 1 \\ 1 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-5} \\ 1e^{-1} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 000001 \\ \frac{ucc}{e5} & \Delta f \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-3} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \cdot \\ \cdot \\ f114 \ \text{in } 5-\\ f116 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 7\\ \cdot \\ \cdot \\ \cdot \\ \end{array}$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 ii
ERT
0 20e+
f114 ii
ERT
0 34e+
f116 ii
ERT
0 16e+

 | n 20-D,
Γ 10%
0 14e+

n 20-D,
Γ 10%
1 23e+

n 20-D,
Γ 10%
3 99e+

 | $\begin{array}{c} N{=}15,\\ 90\%\\ 9\ 23e{+}0\\ \hline \\ 0\ 23e{+}0\\ \hline \\ 0\ 23e{+}0\\ \hline \\ 0\ 23e{+}0\\ \hline \\ 0\ 32e{+}0\\ \hline 0\ 32e{+}0\\ \hline \\ 0\ 32e{+}0\\ \hline \\ 0\ 32e{+}0\\ \hline 0\ 32e{+}0\ 10\ 10\ 10\ 10\ 10\ 10\ 10\ 10\ 10\ 1$ | $\begin{array}{c} {}_{mFE=200001}\\ {}_{RTsucc}\\ {}_{1.1e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RTsucc}\\ {}_{1.0e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RTsucc}\\ {}_{.$ | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-8 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-8 \\ 1e-$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \text{ in } 20\text{-D}, \ N=15, \ \mathrm{mFE}=2\\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{S}}\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+1 \ 1.3\\ \hline 113 \ \mathrm{in } \ 20\text{-D}, \ N=15, \ \mathrm{mFE}=2\\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{S}}\\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 22e+1 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 112e+0 \ 12e+0 \ 12e+0 \ 12e+0 \ 1.1\\ \hline 0 \ 12e+0 \ 12e$ | $\begin{array}{c} & \Delta f \\ \frac{ucc}{e5} & \Delta f \\ 1 \\ 1 \\ 1 \\ e-1 \\ 1e-3 \\ 1e-5 \\ 000001 \\ \frac{ucc}{1} \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 10 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 000001 \\ \frac{\Delta f}{10} \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 000001 \\ 1e-8 \\ 0000001 \\ 1e-8 \\ 000001 \\ 1e-8 \\ 000001 \\ 1e-8 \\ 000000001 \\ 1e-8 \\ 0000001 \\ 1e-8 \\ 1e-$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ .\\.\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ 3.2e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 ii
ER1
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f114 ii
ER1
0 34e+

f116 ii
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f116 ii

 | a 20-D,
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 11 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ \hline \end{array}$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \mbox{ in 20-D, N=15, mFE=2} \\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ \hline 0 \ 44e+3 \ 26e+3 \ 7.1 \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0 \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0 \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0 \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1 \\ \hline 0 \ 21e+0 \ 12e+3 \ 14e+3 \ 25e+3 \ 7.1 \\ \hline \end{array}$ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \Delta f \\ 1 \\ \mathrm{le}{}^{-1} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}^{-5} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}^{-5} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}^{-5} \\ \mathrm{le}{}^{-1} \\ \mathrm{le}{}^{-1} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}^{-5} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}^{-5} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}^{-1} \\ \mathrm{le}{}^{-3} \\ \mathrm{le}{}$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ ERT \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 is # ERT 0 20e + <tr td=""> <tr< td=""><td>$\begin{array}{c} \mathbf{n} \ \ \mathbf{20-D}, \\ \Gamma \ \ \ 10\% \\ 0 \ \ 14e+ \\ \cdot \\$</td><td>$\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 23e + 0 \\ 0 \\ 23e + 0 \\ 0 \\ 35e + 0 \\ 0 \\ 35e + 0 \\ 1 \\ 57e + 1 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$</td><td>$\begin{array}{c} mFE{=}200001 \\ RT_{succ} \\ 1.1e5 \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 1.0e5 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 7.9e4 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 1.4e5 \end{array}$</td></tr<></tr> <tr><td>$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c} f111 \mbox{ in 20-D, N=15, mFE=2} \\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ \hline . \ . \ . \ . \ . \ . \ . \ . \ . \ .$</td><td>$\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ 1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{le}-1}{\mathrm{le}-3} \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{le}-5}{\mathrm{le}-8} \\ \mathrm{le}-8 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{le}-1 \\ le$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29c-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.4e3\\ 2.3e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$</td><td>f 112 ii
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n 20-D,
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</td><td>$\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 28 + 0 \\ 0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$</td><td>$\begin{array}{c} {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{1.1e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}$</td></td></tr> <tr><td>$\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} \\ 1e^{-8} \\ 2e^{-5} \\ 1e^{-8} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td></td><td>$\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5}$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT}\\ 15 \ 3.5\text{ e}2 \ 2\\ 15 \ 1.1\text{ e}4 \ \text{ k}\\ 2 \ 3.5\text{ e}5 \ 1\\ 0 \ 29e-2 \ 6\\ \cdot\\ \\ \# \ \text{ERT}\\ 15 \ 5.5\text{ e}3 \ 4\\ 2 \ 3.5\text{ e}5 \ 1\\ 0 \ 29e-1 \ 6\\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\
\\$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ .\\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ 3.2e4\\ .\\ {\rm .}\\ {\rm .}\\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ 3.4e3\\ 2.3e4\\ 5.0e4\\ 2.5e4\\ .\\ {\rm .}\\ {\rm$</td><td>$\begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ER1} \\ 0 \ 20e+ \\ \cdot \\$</td><td>a 20-D,
$\Gamma = 10\%$
0 = 14e + -
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1 = 10%</td><td>$\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 23e+0\\ 0 \ 23e+0\\ {\rm N=15,}\\ {\rm 90\%}\\ 2 \ 21e+3\\ {\rm .}\\ {\rm .}\\$</td><td>$\begin{array}{c} {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{1.1e5} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{}$</td></tr> <tr><td>$\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c} f111 \ in \ 20\text{-D}, \ N=15, \ mFE=2\\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 7.1\\ \hline 0 \ 22e+1 \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+$</td><td>$\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{b00001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ 1 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{b00001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-8 \\ \mathrm{be}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{be}-8 \\ b$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ ERT \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 6\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$</td><td>$\begin{array}{c} \mathbf{D}, \mathbf{N}\!=\!15, \mathbf{m} \\ 10\% 90\% \\ 2.0e2 \ 5.1e2 \\ 3.2e3 \ 1.5e4 \\ 1.8e5 \ 7e5 \\ 2.6.5 \\ 7e5 \\ 2.6.5 \\ 1.6e5 \\ 7e5 \\ 7ae-2 \ 40e-1 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$</td><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm succ}\\ 3.4{\rm e3}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm$</td><td>$\begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ERT} \\ 0 \ 20e + \\ \cdot \\$</td><td>n 20-D,
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n 20-D,
Γ 10%
1 23e+
n 20-D,
Γ 10%</td><td>N=15,
90%
0 23e+0
1 57e+1
N=15,
90%
2 21e+3
0 15e+1</td><td>mFE=200001
<u>RTsucc</u>
1.1e5

mFE=200001
<u>RTsucc</u>
1.0e5

mFE=200001
<u>RTsucc</u>
7.9e4

mFE=200001
<u>RTsucc</u>
1.4e5

<u>RTsucc</u>
1.4e5

</td></tr> <tr><td>$\begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c} f111 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 113 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 22} + 1 \mbox{ 13} + 1 \mbox{ 28} + 1 \mbox{ 1.6} \\ \hline 115 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 21} + 0 \mbox{ 12} + 0 \mbox{ 29} + 0 \mbox{ 1.1} \\ \hline 117 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 118 + 3 \mbox{ 14} + 3 \mbox{ 25} + 3 \mbox{ 7.1} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \mbox{ in } 10\mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \mbox{ in } 10\mbox{ in } 10\m$</td><td>$\begin{array}{c} \cos 0001 \\ \frac{\operatorname{ucc}}{\operatorname{les}} & \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \cdot \\ \cdot \\ \# \ \text{ERT} \\ 15 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 2\\ \cdot \\ \cdot \\ & \\ &$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$</td><td>f 112 ii
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f 114 ii
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f 114 ii
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f 118 ii
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f 120 ii
ER1</td><td>n 20-D,
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mFE=200001
<u>RTsucc</u>
1.0e5
mFE=200001
<u>RTsucc</u>
7.9e4
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001</td></tr> <tr><td>$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td></td><td>$\begin{array}{c} \cos 0001 \\ \frac{ucc}{e5} & \frac{\Delta f}{10} \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$</td><td>f 112 ii
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f 116 ii
ER1
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f 112 ii
ER1</td><td>n 20-D,
Γ 10%
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n 20-D,
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1 23e+</td><td>$\begin{array}{c} N{=}15,\\ 90\%\\ 0&2s{=}10\\ 0&2s{=}10\\ 0&-\\ \\ N{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&2s{=}10\\ 0&2s{=}15\\ \\ \end{array}$</td><td>$\begin{array}{c} {\rm mFE}{=}200001 \\ {\rm RT}_{\rm succ} \\ 1.1e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$</td></tr> <tr><td>$\begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c} f111 \mbox{ in PE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 113 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 22e+1 } 13e+1 \mbox{ 28e+1 } 1.0 \\ \hline 0 \mbox{ 22e+1 } 13e+1 \mbox{ 28e+1 } 1.0 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+0 } 1.1 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+0 } 1.1 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+3 } 7.1 \\ \hline 117 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 18e+3 } 14e+3 \mbox{ 25e+3 } 7.1 \\ \hline 119 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 17e+0 } 14e+0 \mbox{ 21e+0 } 8.9 \\ \hline \end{array}$</td><td>$\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{id}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{id}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{id}-5 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-1 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$</td><td>f112 ii # ER1 0 20e+ .</td><td>a 20-D,
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\$</td><td>$\begin{array}{c} \begin{array}{c} & \Delta f \\ \\ \underline{ucc} \\ e5 \end{array} & \begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \end{array} \\ 1e^{-5} \\ 1e^{-5}$</td><td>$\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 6\\ \cdot\\ \cdot\\ f114 \ \text{in } 5-\\ \# \ \text{ERT} \\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 6\\ \cdot\\ \cdot\\ \cdot\\ f116 \ \text{in } 5-\\ \cdot\\ f116 \ \text{in } 5-\\ \cdot\\ f118 \ \text{in } 5-\\ \cdot\\ f128 \ \text{in } 5-\\$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ 2.0{\rm e4}\\ 3.2{\rm e4}\\ 3.2{\rm e4}\\ 3.2{\rm e4}\\ 3.2{\rm e4}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ 2.4{\rm e4}\\ 2.2{\rm e4}\\ 2.2{\rm e4}\\ 2.2{\rm e4}\\ 2.2{\rm e4}\\ \end{array}$</td><td>$\begin{array}{c} f112 \text{ is} \\ \# \ \text{ERT} \\ 0 \ 20e+\\ \cdot \ \cdot \\ \cdot \ \cdot \\ \cdot \ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot$</td><td>n 20-D,
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0 14e+
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n 20-D,
Γ 10%</td><td>$\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 23e+0\\ 0 \ 23e+0\\ \hline \\ {\rm N=15,}\\ {\rm 90\%}\\ 2 \ 21e+3\\ \hline \\ {\rm 0}\\ 0 \ 5e+1\\ \hline \\ {\rm}\\ {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 26e+0\\ \hline \\ {\rm}\\ {\rm}\\ {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 26e+0\\ \hline \\ {\rm}\\ \end{array}$</td><td>$\begin{array}{c} {}_{mFE=200001}\\ {}_{RT\underline{succ}}\\ 1.1e5\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$</td></tr> <tr><td>$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-3 \\ 1e-5 \\ 1e-1 \\ 1e-3 \\ 1e-3 \\ 1e-5 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\$</td><td>$\begin{array}{c} f111 \text{ in } 5\text{-D}, \ N=15, \ \mathrm{mFE}=50001 \\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{succ}} \\ 17.2e5 \ 3.5e5 \ 5.7e5 \ 2.0e4 \\ 0 \ 44e+0 \ 12e+0 \ 96e+0 \ 2.0e4 \\ &$</td><td></td><td>$\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \frac{\Delta f}{10} \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{ucc}}{\mathrm{le}-8} \\ \mathrm{le}-8 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-8 \\ \mathrm{le}-8$</td><td>$\begin{array}{c} f112 \mbox{ in } 5-\\ \# \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$</td><td>$\begin{array}{llllllllllllllllllllllllllllllllllll$</td><td>$\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$</td><td>f112 ii
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f114 ii
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f118 ii
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n 20-D,
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</td><td>$\begin{array}{c} N{=}15,\\ 90\%\\ 0 \\ 23{=}46\\ 0 \\ 1 \\ 57{=}15,\\ 90\%\\ 1 \\ 57{=}115,\\ 90\%\\ 2 \\ 2 \\ 1 \\ 57{=}115,\\ 90\%\\ 2 \\ 2 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$</td><td>mFE=200001
<u>RTsucc</u>
1.1e5
mFE=200001
<u>RTsucc</u>
1.0e5
mFE=200001
<u>RTsucc</u>
7.9e4
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001
<u>RTsucc</u>
8.9e4</td></tr> | $\begin{array}{c} \mathbf{n} \ \ \mathbf{20-D}, \\ \Gamma \ \ \ 10\% \\ 0 \ \ 14e+ \\ \cdot \\ $ | $\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 23e + 0 \\ 0 \\ 23e + 0 \\ 0 \\ 35e + 0 \\ 0 \\ 35e + 0 \\ 1 \\ 57e + 1 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$
 | $\begin{array}{c} mFE{=}200001 \\ RT_{succ} \\ 1.1e5 \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 1.0e5 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 7.9e4 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 1.4e5 \end{array}$ | $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 $ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} f111 \mbox{ in 20-D, N=15, mFE=2} \\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ \hline . \ . \ . \ . \ . \ . \ . \ . \ . \ .$ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ 1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{le}-1}{\mathrm{le}-3} \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{le}-5}{\mathrm{le}-8} \\ \mathrm{le}-8 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{le}-1 \\ le$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29c-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.4e3\\ 2.3e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f 112 ii
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\begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{motor} \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-4 \\ \mathrm{le}-3 \\ \mathrm{le}-3 \\ \mathrm{le}-4 \\ \mathrm{le}-3 \\ \mathrm{le}-3 \\ \mathrm{le}-4 \\ \mathrm{le}-3 \\ le$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29c-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\.\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ .\\.\\.\\.\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.4{\rm e3}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ \end{array}$ | f112 ii # ER1 0 20e+ . . <td>n 20-D,
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n 20-D,
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</td> <td>$\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 28 + 0 \\ 0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$</td> <td>$\begin{array}{c} {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{1.1e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}$</td> | n 20-D,
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 | $\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 28 + 0 \\ 0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$ | $\begin{array}{c} {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{1.1e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}$ | $\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} \\ 1e^{-8} \\ 2e^{-5} \\ 1e^{-8} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $ \begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT}\\ 15 \ 3.5\text{ e}2 \ 2\\ 15 \ 1.1\text{ e}4 \ \text{ k}\\ 2 \ 3.5\text{ e}5 \ 1\\ 0 \ 29e-2 \ 6\\ \cdot\\ \\ \# \ \text{ERT}\\ 15 \ 5.5\text{ e}3 \ 4\\ 2 \ 3.5\text{ e}5 \ 1\\ 0 \ 29e-1 \ 6\\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ .\\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ 3.2e4\\ .\\ {\rm .}\\ {\rm .}\\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ 3.4e3\\ 2.3e4\\ 5.0e4\\ 2.5e4\\ .\\ {\rm .}\\ {\rm$ | $ \begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ER1} \\ 0 \ 20e+ \\ \cdot \\ $ | a 20-D,
$\Gamma = 10\%$
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1 = 10% | $\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 23e+0\\ 0 \ 23e+0\\ {\rm N=15,}\\ {\rm 90\%}\\ 2 \ 21e+3\\ {\rm .}\\ {\rm .}\\$ | $\begin{array}{c} {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{1.1e5} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{} \\
{}_{} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{} $ | $\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 $ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \ in \ 20\text{-D}, \ N=15, \ mFE=2\\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 7.1\\ \hline 0 \ 22e+1 \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+$ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{b00001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ 1 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{b00001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-8 \\ \mathrm{be}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{be}-8 \\ b$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ ERT \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 6\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{c} \mathbf{D}, \mathbf{N}\!=\!15, \mathbf{m} \\ 10\% 90\% \\ 2.0e2 \ 5.1e2 \\ 3.2e3 \ 1.5e4 \\ 1.8e5 \ 7e5 \\ 2.6.5 \\ 7e5 \\ 2.6.5 \\ 1.6e5 \\ 7e5 \\ 7ae-2 \ 40e-1 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm succ}\\ 3.4{\rm e3}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm $ | $ \begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ERT} \\ 0 \ 20e + \\ \cdot \\$ | n 20-D,
Γ 10%
0 14e+
n 20-D,
Γ 10%
1 23e+
n 20-D,
Γ 10% | N=15,
90%
0 23e+0
1 57e+1
N=15,
90%
2 21e+3
0 15e+1 | mFE=200001
<u>RTsucc</u>
1.1e5

mFE=200001
<u>RTsucc</u>
1.0e5

mFE=200001
<u>RTsucc</u>
7.9e4

mFE=200001
<u>RTsucc</u>
1.4e5

<u>RTsucc</u>
1.4e5

 | $\begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 113 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 22} + 1 \mbox{ 13} + 1 \mbox{ 28} + 1 \mbox{ 1.6} \\ \hline 115 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 21} + 0 \mbox{ 12} + 0 \mbox{ 29} + 0 \mbox{ 1.1} \\ \hline 117 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 118 + 3 \mbox{ 14} + 3 \mbox{ 25} + 3 \mbox{ 7.1} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \mbox{ in } 10\mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \mbox{ in } 10\mbox{ in } 10\m$ | $\begin{array}{c} \cos 0001 \\ \frac{\operatorname{ucc}}{\operatorname{les}} & \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \cdot \\ \cdot \\ \# \ \text{ERT} \\ 15 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 2\\ \cdot \\ \cdot \\ & \\ &$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f 112 ii
ER1
0 20e+

f 114 ii
ER1
0 34e+

f 114 ii
ER1
0 16e+

f 118 ii
ER1
0 18e+

f 120 ii
ER1 | n 20-D,
Γ 10%
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10% | $\begin{array}{c} N{=}15,\\ 90\%\\ 0 \\ 280\%\\ 1 \\ 90\%\\ 1 \\ 57e+1\\ 1 \\ $ | mFE=200001
<u>RTsucc</u>
1.1e5
mFE=200001
<u>RTsucc</u>
1.0e5
mFE=200001
<u>RTsucc</u>
7.9e4
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001 | $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} \cos 0001 \\ \frac{ucc}{e5} & \frac{\Delta f}{10} \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f 112 ii
ER1
0 20e+

f 114 ii
ER1
0 34e+

f 116 ii
ER1
0 16e+

f 116 ii
ER1
0 16e+

f 112 ii
ER1 | n 20-D,
Γ 10%
0 14e+
n 20-D,
Γ 10%
1 23e+ | $\begin{array}{c} N{=}15,\\ 90\%\\ 0&2s{=}10\\ 0&2s{=}10\\ 0&-\\ \\ N{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&2s{=}10\\ 0&2s{=}15\\ \\ \end{array}$ | $\begin{array}{c} {\rm mFE}{=}200001 \\ {\rm RT}_{\rm succ} \\ 1.1e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | $\begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \mbox{ in PE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 113 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 22e+1 } 13e+1 \mbox{ 28e+1 } 1.0 \\ \hline 0 \mbox{ 22e+1 } 13e+1 \mbox{ 28e+1 } 1.0 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+0 } 1.1 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+0 } 1.1 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+3 } 7.1 \\
\hline 117 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 18e+3 } 14e+3 \mbox{ 25e+3 } 7.1 \\ \hline 119 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 17e+0 } 14e+0 \mbox{ 21e+0 } 8.9 \\ \hline \end{array} $ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{id}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{id}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{id}-5 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-1 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 ii # ER1 0 20e+ . | a 20-D,
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Γ 10%
0 14e+
n 20-D,
Γ 10%
n 20-D,
Γ 10% | $\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 23e+0\\ 0 \ 23e+0\\ \hline \\ {\rm N=15,}\\ {\rm 90\%}\\ 2 \ 21e+3\\ \hline \\ {\rm 0}\\ 0 \ 5e+1\\ \hline \\ {\rm}\\ {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 26e+0\\ \hline \\ {\rm}\\ {\rm}\\ {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 26e+0\\ \hline \\ {\rm}\\ \end{array}$ | $\begin{array}{c} {}_{mFE=200001}\\ {}_{RT\underline{succ}}\\ 1.1e5\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-3 \\ 1e-5 \\ 1e-1 \\ 1e-3 \\ 1e-3 \\ 1e-5 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\$ | $ \begin{array}{c} f111 \text{ in } 5\text{-D}, \ N=15, \ \mathrm{mFE}=50001 \\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{succ}} \\ 17.2e5 \ 3.5e5 \ 5.7e5 \ 2.0e4 \\ 0 \ 44e+0 \ 12e+0 \ 96e+0 \ 2.0e4 \\ & & & & & & & & & & & & & & & & & & $ | | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \frac{\Delta f}{10} \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{ucc}}{\mathrm{le}-8} \\ \mathrm{le}-8 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-8 \\ \mathrm{le}-8$ | $\begin{array}{c} f112 \mbox{ in } 5-\\ \# \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 ii
ER1
0 20e+

f114 ii
ER1
0 34e+

f116 ii
ER1
0 16e+

f118 ii
ER1
0 18e+
f118 ii
ER1
0 0 20e+ | n 20-D,
Γ 10%
0 14e+

n 20-D,
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n 20-D,
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1 23e+

n 20-D,
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n 20-D,
Γ 10%

 | $\begin{array}{c} N{=}15,\\ 90\%\\ 0 \\ 23{=}46\\ 0 \\ 1 \\ 57{=}15,\\ 90\%\\ 1 \\ 57{=}115,\\ 90\%\\ 2 \\ 2 \\ 1 \\ 57{=}115,\\ 90\%\\ 2 \\ 2 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1
\\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $ | mFE=200001
<u>RTsucc</u>
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<u>RTsucc</u>
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<u>RTsucc</u>
7.9e4
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001
<u>RTsucc</u>
8.9e4 |
| $\begin{array}{c} \mathbf{n} \ \ \mathbf{20-D}, \\ \Gamma \ \ \ 10\% \\ 0 \ \ 14e+ \\ \cdot \\ $ | $\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 23e + 0 \\ 0 \\ 23e + 0 \\ 0 \\ 35e + 0 \\ 0 \\ 35e + 0 \\ 1 \\ 57e + 1 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\$ | $\begin{array}{c} mFE{=}200001 \\ RT_{succ} \\ 1.1e5 \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 1.0e5 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 7.9e4 \\ . \\ . \\ . \\ . \\ mFE{=}200001 \\ RT_{succ} \\ 1.4e5 \end{array}$ | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-1 $ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} f111 \mbox{ in 20-D, N=15, mFE=2} \\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3 \\ \hline . \ . \ . \ . \ . \ . \ . \ . \ . \ .$ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ 1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{le}-1}{\mathrm{le}-3} \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{le}-5}{\mathrm{le}-8} \\ \mathrm{le}-8 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{le}-1 \\ le$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29c-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.4e3\\ 2.3e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f 112 ii
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f 116 ii
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f 118 ii
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 | n 20-D,
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-1$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{motor} \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{motor} \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-4 \\ \mathrm{le}-3 \\ \mathrm{le}-3 \\ \mathrm{le}-4 \\ \mathrm{le}-3 \\ \mathrm{le}-3 \\ \mathrm{le}-4 \\ \mathrm{le}-3 \\ le$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29c-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\.\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ .\\.\\.\\.\\.\\.\\{\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.4{\rm e3}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ \end{array}$ | f112 ii # ER1 0 20e+ . . <td>n 20-D,
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0 14e+

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</td> <td>$\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 28 + 0 \\ 0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$</td> <td>$\begin{array}{c} {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{1.1e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}$</td>

 | n 20-D,
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 | $\begin{array}{c} N = 15, \\ 90\% \\ 0 \\ 28 + 0 \\ 0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$ | $\begin{array}{c} {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{1.1e5}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}\\ {}_{}\\ {}_{}\\ {}_{mFE=200001}\\ {}_{RT_{succ}}\\ {}_{}$ | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} \\ 1e^{-8} \\ 2e^{-5} \\ 1e^{-8} \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | $ \begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-1} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} \\ \mathrm{le}^{-3} \\ \mathrm{le}^{-5} $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT}\\ 15 \ 3.5\text{ e}2 \ 2\\ 15 \ 1.1\text{ e}4 \ \text{ k}\\ 2 \ 3.5\text{ e}5 \ 1\\ 0 \ 29e-2 \ 6\\ \cdot\\ \\ \# \ \text{ERT}\\ 15 \ 5.5\text{ e}3 \ 4\\ 2 \ 3.5\text{ e}5 \ 1\\ 0 \ 29e-1 \ 6\\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\ \cdot\\ \\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5e3\\ 5.0e4\\ 2.0e4\\ .\\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 2.4e4\\ 3.2e4\\ .\\ {\rm .}\\ {\rm .}\\ {\rm .}\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ 3.4e3\\ 2.3e4\\ 5.0e4\\ 2.5e4\\ .\\ {\rm .}\\ {\rm$ | $ \begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ER1} \\ 0 \ 20e+ \\ \cdot \\ $

 | a 20-D,
$\Gamma = 10\%$
0 = 14e + -
14e + -
14e + -
14e + -
123e + -
123e + -
123e + -
10%
3 = 99e + -
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 | $\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 23e+0\\ 0 \ 23e+0\\ {\rm N=15,}\\ {\rm 90\%}\\ 2 \ 21e+3\\ {\rm .}\\ {\rm .}\\$ | $\begin{array}{c} {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{1.1e5} \\ {}_{} \\ {}_{} \\ {}_{} \\ {}_{mFE=200001} \\ {}_{RT_{succ}} \\ {}_{} $ | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 $ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \ in \ 20\text{-D}, \ N=15, \ mFE=2\\ \# \ ERT \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 73e+3 \ 1.3\\ \hline 0 \ 44e+3 \ 26e+3 \ 7.1\\ \hline 0 \ 22e+1 \ 10\% \ 90\% \ RT_{\rm S} \\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 22e+1 \ 13e+1 \ 28e+1 \ 1.0\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 12e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 21e+0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+0 \ 29e+0 \ 1.1\\ \hline 0 \ 29e+0 \ 29e+$ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{b00001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ 1 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{b00001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-8 \\ \mathrm{be}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{be}-8 \\ b$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ ERT \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 6\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{c} \mathbf{D}, \mathbf{N}\!=\!15, \mathbf{m} \\ 10\% 90\% \\ 2.0e2 \ 5.1e2 \\ 3.2e3 \ 1.5e4 \\ 1.8e5 \ 7e5 \\ 2.6.5 \\ 7e5 \\ 2.6.5 \\ 1.6e5 \\ 7e5 \\ 7ae-2 \ 40e-1 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $
 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ 2.4{\rm e4}\\ 3.2{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ {\rm RT}_{\rm succ}\\ {\rm RT}_{\rm succ}\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm succ}\\ 3.4{\rm e3}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ .\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm succ}\\ {\rm rt}\\ {\rm $ | $ \begin{array}{c} f_{112} \text{ is} \\ \# \ \text{ERT} \\ 0 \ 20e + \\ \cdot \\$

 | n 20-D,
Γ 10%
0 14e+
n 20-D,
Γ 10%
1 23e+
n 20-D,
Γ 10%
 | N=15,
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0 23e+0
1 57e+1
N=15,
90%
2 21e+3
0 15e+1 | mFE=200001
<u>RTsucc</u>
1.1e5

mFE=200001
<u>RTsucc</u>
1.0e5

mFE=200001
<u>RTsucc</u>
7.9e4

mFE=200001
<u>RTsucc</u>
1.4e5

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| $\begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 0 \mbox{ 44} + 3 \mbox{ 26} + 3 \mbox{ 73} + 3 \mbox{ 1.3} \\ \hline 113 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 22} + 1 \mbox{ 13} + 1 \mbox{ 28} + 1 \mbox{ 1.6} \\ \hline 115 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 0 \mbox{ 21} + 0 \mbox{ 12} + 0 \mbox{ 29} + 0 \mbox{ 1.1} \\ \hline 117 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 118 + 3 \mbox{ 14} + 3 \mbox{ 25} + 3 \mbox{ 7.1} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \mbox{ in } 10\mbox{ 90\% } RT_{\rm s} \\ \hline 119 \mbox{ in } 20\mbox{-}D, \mbox{ N=15, mFE=2} \\ \mbox{ in } 10\mbox{ in } 10\m$ | $\begin{array}{c} \cos 0001 \\ \frac{\operatorname{ucc}}{\operatorname{les}} & \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 9\\ \cdot \\ \cdot \\ \# \ \text{ERT} \\ 15 \ 5.5e3 \ 4\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 2\\ \cdot \\ \cdot \\ & \\ &$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f 112 ii
ER1
0 20e+

f 114 ii
ER1
0 34e+

f 114 ii
ER1
0 16e+

f 118 ii
ER1
0 18e+

f 120 ii
ER1

 | n 20-D,
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<u>RTsucc</u>
1.1e5
mFE=200001
<u>RTsucc</u>
1.0e5
mFE=200001
<u>RTsucc</u>
7.9e4
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001 | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \frac{\Delta f}{10} \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | $\begin{array}{c} \cos 0001 \\ \frac{ucc}{e5} & \frac{\Delta f}{10} \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ $ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5c2 \ 2\\ 15 \ 1.1c4 \ 8\\ 2 \ 3.5c5 \ 1\\ 0 \ 29e-2 \ 9\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f 112 ii
ER1
0 20e+

f 114 ii
ER1
0 34e+

f 116 ii
ER1
0 16e+

f 116 ii
ER1
0 16e+

f 112 ii
ER1

 | n 20-D,
Γ 10%
0 14e+
n 20-D,
Γ 10%
1 23e+ | $\begin{array}{c} N{=}15,\\ 90\%\\ 0&2s{=}10\\ 0&2s{=}10\\ 0&-\\ \\ N{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&1s{=}15,\\ 90\%\\ 0&2s{=}10\\ 0&2s{=}15\\ \\ \end{array}$ | $\begin{array}{c} {\rm mFE}{=}200001 \\ {\rm RT}_{\rm succ} \\ 1.1e5 \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $ | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \mbox{ in PE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 0 \mbox{ 44e+3 } 26e+3 \mbox{ 73e+3 } 1.3 \\ \hline 113 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 22e+1 } 13e+1 \mbox{ 28e+1 } 1.0 \\ \hline 0 \mbox{ 22e+1 } 13e+1 \mbox{ 28e+1 } 1.0 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+0 } 1.1 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+0 } 1.1 \\ \hline 0 \mbox{ 21e+0 } 12e+0 \mbox{ 29e+3 } 7.1 \\ \hline 117 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 18e+3 } 14e+3 \mbox{ 25e+3 } 7.1 \\ \hline 119 \mbox{ in 20-D, N=15, mFE=2} \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } RT_{\rm S} \\ \hline 0 \mbox{ 17e+0 } 14e+0 \mbox{ 21e+0 } 8.9 \\ \hline \end{array} $ | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{id}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{id}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{id}-5 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-8 \\ \mathrm{id}-1 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm{id}-5 \\ \mathrm{id}-8 \\ \mathrm$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 1.1e4 \ 8\\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 5\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$
 | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 ii # ER1 0 20e+ .

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| $\begin{array}{c} \Delta f \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ $ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c} f111 \mbox{ in 20-D, N=15, mFE=2} \\ \# \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$ | $\begin{array}{c} \begin{array}{c} & \Delta f \\ \\ \underline{ucc} \\ e5 \end{array} & \begin{array}{c} \Delta f \\ 1 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \end{array} \\ 1e^{-5} \\ 1e^{-5}$ | $\begin{array}{c} f112 \text{ in } 5-\\ \# \ \text{ERT} \\ 15 \ 3.5e2 \ 2\\ 15 \ 3.5e5 \ 1\\ 0 \ 29e-2 \ 6\\ \cdot\\ \cdot\\ f114 \ \text{in } 5-\\ \# \ \text{ERT} \\ 2 \ 3.5e5 \ 1\\ 0 \ 29e-1 \ 6\\ \cdot\\ \cdot\\ \cdot\\ f116 \ \text{in } 5-\\ \cdot\\ f116 \ \text{in } 5-\\ \cdot\\ f118 \ \text{in } 5-\\ \cdot\\ f128 \ \text{in } 5-\\$ | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | $\begin{array}{r} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5{\rm e2}\\ 3.5{\rm e2}\\ 1.1{\rm e4}\\ 4.3{\rm e4}\\ 1.8{\rm e4}\\ .\\ {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 5.5{\rm e3}\\ 5.0{\rm e4}\\ 2.0{\rm e4}\\ 2.0{\rm e4}\\ 3.2{\rm e4}\\ 3.2{\rm e4}\\ 3.2{\rm e4}\\ 3.2{\rm e4}\\ 2.3{\rm e4}\\ 5.0{\rm e4}\\ 2.5{\rm e4}\\ 2.4{\rm e4}\\ 2.2{\rm e4}\\ 2.2{\rm e4}\\ 2.2{\rm e4}\\ 2.2{\rm e4}\\ \end{array}$
 | $\begin{array}{c} f112 \text{ is} \\ \# \ \text{ERT} \\ 0 \ 20e+\\ \cdot \ \cdot \\ \cdot \ \cdot \\ \cdot \ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot $

 | n 20-D,
Γ 10%
0 14e+
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 | $\begin{array}{c} {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 23e+0\\ 0 \ 23e+0\\ \hline \\ {\rm N=15,}\\ {\rm 90\%}\\ 2 \ 21e+3\\ \hline \\ {\rm 0}\\ 0 \ 5e+1\\ \hline \\ {\rm}\\ {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 26e+0\\ \hline \\ {\rm}\\ {\rm}\\ {\rm N=15,}\\ {\rm 90\%}\\ 0 \ 26e+0\\ \hline \\ {\rm}\\ \end{array}$ | $\begin{array}{c} {}_{mFE=200001}\\ {}_{RT\underline{succ}}\\ 1.1e5\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | | | | | | | | | | | | | | | | | |
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| $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ \hline 10 \\ 1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ 1e-1 \\ 1e-3 \\ 1e-3 \\ 1e-5 \\ 1e-1 \\ 1e-3 \\ 1e-3 \\ 1e-5 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\$ | $ \begin{array}{c} f111 \text{ in } 5\text{-D}, \ N=15, \ \mathrm{mFE}=50001 \\ \# \ \mathrm{ERT} \ 10\% \ 90\% \ \mathrm{RT}_{\mathrm{succ}} \\ 17.2e5 \ 3.5e5 \ 5.7e5 \ 2.0e4 \\ 0 \ 44e+0 \ 12e+0 \ 96e+0 \ 2.0e4 \\ & & & & & & & & & & & & & & & & & & $ | | $\begin{array}{c} & \Delta f \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \Delta f \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{le}5} & \frac{\Delta f}{10} \\ 1 \\ \mathrm{le}-1 \\ \mathrm{le}-3 \\ \mathrm{le}-5 \\ \mathrm{le}-8 \\ \mathrm{000001} \\ \frac{\mathrm{ucc}}{\mathrm{e}5} & \frac{\Delta f}{10} \\ \frac{\mathrm{ucc}}{\mathrm{le}-8} \\ \mathrm{le}-8 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-1 \\ \mathrm{le}-8 \\ \mathrm{le}-8$ | $\begin{array}{c} f112 \mbox{ in } 5-\\ \# \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $ | $\begin{array}{llllllllllllllllllllllllllllllllllll$
 | $\begin{array}{c} {\rm FE}{=}50001\\ {\rm RT}_{\rm succ}\\ 3.5e2\\ 1.1e4\\ 4.3e4\\ 1.8e4\\ .\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.\\.$ | f112 ii
ER1
0 20e+

f114 ii
ER1
0 34e+

f116 ii
ER1
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f118 ii
ER1
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f118 ii
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 | n
20-D,
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 | $\begin{array}{c} N{=}15,\\ 90\%\\ 0 \\ 23{=}46\\ 0 \\ 1 \\ 57{=}15,\\ 90\%\\ 1 \\ 57{=}115,\\ 90\%\\ 2 \\ 2 \\ 1 \\ 57{=}115,\\ 90\%\\ 2 \\ 2 \\ 1 \\ 57{=}115,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 57{=}105,\\ 90\%\\ 0 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $ | mFE=200001
<u>RTsucc</u>
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mFE=200001
<u>RTsucc</u>
1.0e5
mFE=200001
<u>RTsucc</u>
7.9e4
mFE=200001
<u>RTsucc</u>
1.4e5
mFE=200001
<u>RTsucc</u>
8.9e4 |
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Table 1: Shown are, for functions $f_{101}-f_{120}$ and for a given target difference to the optimal function value Δf : the number of successful trials (#); the expected running time to surpass $f_{opt} + \Delta f$ (ERT, see Figure 1); the 10%-tile and 90%-tile of the bootstrap distribution of ERT; the average number of function evaluations in successful trials or, if none was successful, as last entry the median number of function evaluations to reach the best function value (\mathbf{RT}_{succ}). If $f_{opt} + \Delta f$ was never reached, figures in *italics* denote the best achieved Δf -value of the median trial and the 10% and 90%-tile trial. Furthermore, N denotes the number of trials, and mFE denotes the maximum of number of function evaluations executed in one trial. See Figure 1 for the names of functions.



Figure 2: Empirical cumulative distribution functions (ECDFs), plotting the fraction of trials versus running time (left subplots) or versus Δf (right subplots). The thick red line represents the best achieved results. Left subplots: ECDF of the running time (number of function evaluations), divided by search space dimension D, to fall below $f_{opt} + \Delta f$ with $\Delta f = 10^k$, where k is the first value in the legend. Right subplots: ECDF of the best achieved Δf divided by 10^k (upper left lines in continuation of the left subplot), and best achieved Δf divided by 10^{-8} for running times of D, 10 D, 100 D... function evaluations (from right to left cycling black-cyan-magenta). Top row: all results from all functions; second row: moderate noise functions; third row: severe noise functions; fourth row: severe noise and highly-multimodal functions. The legends indicate the number of functions that were solved in at least one trial. FEvals denotes number of function evaluations, D and DIM denote search space dimension, and Δf and Df denote the difference to the optimal function value.

Λf	f_{121} in 5-D, N=15, mFE=50001	f121 in 20-D, N=15, mFE=200001	f_{122} in 5-D, N=15, mFE=50001	f_{122} in 20-D, N=15, mFE=200001
<u></u>	# ERI 10% 90% R1succ	# ERT 10% 50% RTsucc	$\Delta j = \frac{10}{4}$ Entri 10% 50% Intrsucc	$\frac{4}{7}$ ER1 10% 50% R1succ
10	15 1.461 5.760 1.661 1.461 15 1.163 7.062 1.563 1.163	$0 3^{2}e^{-1} 1^{8}e^{-1} 1^{9}e^{-1} 1^{9}e^{5}$	1 6 1 0 5 6 9 6 1 8 65 3 8 64	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
10-1	14 1 664 1 264 2 164 1 664	0 528-1 188-1 458-1 1.085	10 1.000 0.004 1.000 0.004	0 826-1 726-1 116+0 1.065
10-3	$0 \ 25e-2 \ 16e-2 \ 66e-2 \ 28e4$		1e-3	
10-5	0 000 0 100 0 000 0 2.004		1e-5	
10-8			10-8	
10-0	fice in 5 D N=15 mFF=50001	floo in 20 D N=15 mEE=200001	find in 5 D N=15 mEE=50001	find in 20 D N=15 mEE=200001
Δf	# FPT 10% 00% PT	# FPT 10% 00% PT	$\Lambda f = FPT = 10\% = 00\% PT$	# EPT 10% 00% PT
10	$\frac{4}{15}$ 2 0 c2 1 4 c2 5 0 c2 2 0 c2	$\frac{4}{4}$ ERT 10% 50% RT _{SUCC}	$\Delta J = \frac{10}{4}$ ER1 10% 50% R1 _{succ}	$\frac{\#}{15}$ $\frac{100}{2}$ $\frac{100}{2}$ $\frac{300}{2}$ $\frac{1100}{2}$ $\frac{300}{2}$ $\frac{1100}{2}$
10	0 210 1 120 1 270 1 1 604	$0 0/a 1 76a 1 19a \mid 0 7 1a4$	10 15 4.0 er 1.3 er 3.1 er 4.0 er	0 510 1 250 1 660 1 7 004
10-1	0 210-1 120-1 270-1 1.004	0 546-1 106-1 12670 1.164	$1 = 1 = 0 = 28e^{-0} = 2/e^{-0} = 28e^{-0}$	0 516-1 556-1 006-1 1.564
10-3			1e-3	
10-5			1e-5	
1e - 8			1e-8	
10 0	ftor in 5 D N-15 EE-50001	ftor in 20 D N-15 EE-200001	fice in 5 D N-15	free in 20 D N-15 - FE-200001
Λf	J_{125} In 5-D, N=13, MFE=30001	J_{125} In 20-D, N=13, InFE=200001	$\int 126 \text{ In } 5\text{-}D, \text{ N}=13, \text{ In F} E=50001$	J_{126} In 20-D, N=13, In E=200001
<u></u>	# ERT 10% 90% RTsucc	# ERT 10% 90% R1succ	$\Delta j = 10^{-15} \pm 10^{-0} \pm 10^{-0} \pm 10^{-0} \pm 10^{-0}$	# ERT 10/0 90/0 RTSUCC
10	15 1.000 1.000 1.000 1.000	10 1 0 5 1 5 5 2 6 5 1 2 5	10 15 1.000 1.000 1.000 1.000	2 1 4 6 7 4 5 2 9 6 2 0 5
1 1 1	13 1.462 7.061 2.162 1.462		1 15 4.1e2 2.1e2 0.1e2 4.1e2	2 1.400 7.405 >300 2.005
1e-1	11 4.004 5.704 0.104 5.504	0 90e-2 72e-2 11e-1 1.0e5	1e - 1 4 1.0e5 1.0e5 3.5e5 3.9e4	0 11e-1 97e-2 12e-1 7.9e4
1e-5	0 75e-5 50e-5 11e-2 5.2e4		1e-5 0 12e-2 00e-5 21e-2 2.0e4	
10 8			10 8	
16-9	fice = 5 D N-15 EE-50001	fier in 20 D N-15 - FE-200001	free in 5 D N-15 mEE-50001	ftao in 20 D N-15 - EE-200001
A .£	J_{127} III 5-D, N=15, IIIF E=50001	J_{127} III 20-D, N=13, III E=200001	J_{128} III 5-D, N=15, III E=50001	J_{128} In 20-D, N=13, InFE=200001
<u></u>	# EKI 10% 90% KI _{succ}	$\frac{15}{1000}$ 1000 1000 1000	$\Delta J = E R I = 10\% = 90\% R I_{SUCC}$	# ERI 10% 90% RI _{succ}
10	15 1.300 1.000 1.700 1.300	15 1.000 1.000 1.000 1.000	10 13 1.0e3 0.3e2 1.4e3 1.0e3	0 000+0 000+0 100+0 1.105
10 1	0 5 5 64 2 0 64 7 0 64 2 1 64	$15 \ 5.004 \ 2.204 \ 5.804 \ 5.004$	1 13 2.004 1.404 2.704 1.704	
10 2	0 000 2 /80 2 120 0 2 204	0 816-2 086-2 906-2 1.065	10 - 1 3 3.364 3.364 7.764 3.364	
10-5	0 520 5 460 5 160 2 2.204		1e-5 2 3 3e5 1 8e5 >7e5 5 0e4	
10-8			1e - 8 = 0 = 28e - 8 = 16e - 7 = 10e - 1 = 20e 4	
10-0	fice = 5 D N-15 - EE-50001	fice in 20 D N-15 - FE-200001	f122 in 5 D N-15 mEE-50001	ft 20 in 20 D N-15 - EE-200001
Λf	J_{129} In 5-D, N=15, MFE=50001	J_{129} In 20-D, N=13, InFE=200001	$\int 130 \text{ In } 5\text{-}D, \text{ N}=13, \text{ In } E=50001$	J_{130} In 20-D, N=13, In E=200001
<u></u>	# Enti 10% 50% It1succ	# ERT 10% 90% RTSucc	$\Delta j = 10$ 15 15-2 75-1 2.2-2 15-2	# ERT 10/0 50/0 RTSUCC
1	8 6 1 e/ / 2 e/ 9 5 e/ 2 0 e/	0 10070 00070 12070 1.003	1 15 5 5 63 3 3 63 7 8 63 5 5 62	$0 25e_1 20e_1 50e_1 10c5$
10-1	2 3 5 65 1 9 65 \7 65 5 0 64		1e-1 15 1 4e4 1 0e4 1 8e4 1 4e4	0 200 1 200 1 000-1 1.000
1e - 3	$0 77e-2 80e-3 28e-1 1 8e^{4}$		1e=3 3 2 2e5 1 2e5 6 9e5 3 3e4	
1e - 5	0 776 5 006 0 206 1 11004		1e-5 0 $71e-4$ $29e-5$ $89e-3$ 1 $6e4$	
1e - 8			1e-8	
10 0			10 0	

Table 2: Shown are, for functions $f_{121}-f_{130}$ and for a given target difference to the optimal function value Δf : the number of successful trials (#); the expected running time to surpass $f_{opt} + \Delta f$ (ERT, see Figure 1); the 10%-tile and 90%-tile of the bootstrap distribution of ERT; the average number of function evaluations in successful trials or, if none was successful, as last entry the median number of function evaluations to reach the best function value (\mathbf{RT}_{succ}). If $f_{opt} + \Delta f$ was never reached, figures in *italics* denote the best achieved Δf -value of the median trial and the 10% and 90%-tile trial. Furthermore, N denotes the number of trials, and mFE denotes the maximum of number of function evaluations executed in one trial. See Figure 1 for the names of functions.

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