Black-Box Optimization Benchmarking: Results for the $BayEDA_{cG}$ Algorithm on the Noiseless Function Testbed

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Keywords

Benchmarking, Black-box optimization, Evolutionary computation

1. INTRODUCTION

This paper presents experimental results for the BayEDA_{cG} continuous optimization algorithm on the BBOB noise free benchmark problem suite as part of the GECCO'09 Workshop.

2. ALGORITHM PRESENTATION

BayEDA_{cG} is an Estimation of Distribution Algorithm that uses Bayesian Inference to learn a posterior distribution over model parameters for the probability density estimation model used [2]. In this algorithm, the distribution is a product of univariate Gaussian distributions and inference is performed over mean and variance parameters for each dimension in the search space. The algorithm is described for a one-dimensional problem in Table 1. Given the factorized probability model, the extension to the multidimensional case is straightforward.

The following description of the algorithm is from [2]:

For a univariate Gaussian (Normal) model distribution, Bayesian inference can readily be carried out: the resulting expressions given here are drawn from Gelman et al. [3]. We consider the simplest case of a noninformative (flat) prior for the model parameters, expressing no preference for any

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Table 1: Algorithm: BayEDA_{cG}.

Given: population size M, selection parameter τ BEGIN (set t = 0) Generate M individ. uniformly in SREPEAT for $t = 1, 2, \ldots$ until stopping criterion is met Select $M_{sel} = \text{Round}(M \cdot \tau)$ individ. via truncation Calculate sample mean \overline{x} and variance s^2 of D Sample M individuals from $p_t(\mathbf{x}|D, \theta)$: FOR i=1:MDraw sample variance $\tilde{\sigma}^2 \sim \text{Inv} - \chi^2(M_{sel} - 1, s^2)$ Draw sample mean $\tilde{\mu} \sim N(\overline{x}, \tilde{\sigma}^2/(M_{sel}))$ Draw new individual $\mathbf{x}_i \sim N(\tilde{\mu}, \tilde{\sigma}^2)$ ENDFOR ENDREPEAT END

particular values for the model parameters before observing any data. In this case, inference depends only on the data (selected individuals). The standard noninformative prior is uniform on $(\mu, \log \sigma^2)$ or

$$p(\mu, \sigma^2) \propto (\sigma^2)^{-1}$$

The joint posterior can be factorised as

$$p(\mu, \sigma^2 | D) = p(\mu | \sigma^2, D) p(\sigma^2 | D)$$

In this case, the marginal density for σ is

$$\sigma^2 | D \sim \text{Inv} - \chi^2 (M_{sel} - 1, s^2) \tag{1}$$

where s^2 is the sample variance of the data. The conditional density for μ is

$$\mu|D,\sigma^2 \sim N(\overline{x},\sigma^2/M_{sel}) \tag{2}$$

where \overline{x} is the sample mean of the data D.

The predictive distribution for \tilde{x} given the data, μ and σ is

$$\tilde{x}|D,\mu,\sigma^2 \sim N(\mu,\sigma^2) \tag{3}$$

In the BayEDA_{cG} algorithm, sampling from the posterior predictive distribution $p(\tilde{x}|D)$ can be easily carried out in a three-step process. Firstly, a sample $\tilde{\sigma}^2$ is drawn from (1), then this sample is used to draw a sample $\tilde{\mu}$ from (2) and finally both samples are used to draw a sample \tilde{x} from (3). The process is repeated M times to produce the population for use in the next generation.

The algorithm is summarized in Table 1. Note that for implementation purposes, a random draw y from an inverse- χ^2 distribution can be obtained by firstly drawing a sample

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z from the χ^2 distribution and applying $y = s^2/z$. The χ^2 distribution is also a special case of the gamma distribution (see [3] for details).

3. EXPERIMENTAL PROCEDURE

The BayEDA_{cG} algorithm was run on the current set of BBOB noiseless benchmark functions (see other document for results on noisy functions). No parameter tuning was attempted with respect to the functions. The population size (M) was set to 10 times the dimensionality of the problem. The selection threshold τ (for truncation selection) was set (rather arbitrarily) to 0.8. The total number of function evaluations was set to 2000 times the problem dimensionality (making the total number of generations for each run of the algorithm equal to 200).

The $crafting \ effort$ for this set of experiments is zero in this case.

4. **RESULTS**

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

5. CPU TIMING EXPERIMENT

For the timing experiment the BayEDA_{cG} algorithm was run as suggested on f_8 until at least 30 seconds has passed. The experiments in this paper were conducted on an Intel Pentium 4 quad core 2.4Ghz processor running Linux 2.6.24-23 SMP and Matlab R2008a. The results were (in seconds per function evaluation) 2.9;3.2;3.8;5.3 and 8.3 ×10⁻⁴ for dimension 2;3;5;10 and 20D and 1.4 ×10⁻³ for 40D.

6. CONCLUSION

The results show a wide variety of performance across the different test functions. Some functions seem reasonably well-solved for a range of precision and dimensionality values while others show only modest performance. This is for a reasonably small number of function evaluations. Neverthess, it will be intersting to see comparative analysis at the workshop.

7. 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_1 and f_{24}) versus dimension in log-log presentation. The $ERT(\Delta f)$ 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.

	f1 in 5-D, N=15, mFE=10000	f1 in 20-D , N=15, mFE=40000		f2 in 5-D, N=15,	mFE=10000	f2 in 20-I	D, N=15, mF	E=40000
$\frac{\Delta f}{10}$	# ERT 10% 90% RT _{succ} 15 5.7e1 3.9e1 7.6e1 5.7e1	$\frac{\# \text{ ERT } 10\% 90\% \text{ RT}_{\text{succ}}}{15 4.6 \text{ e3} 4.4 \text{ e3} 4.7 \text{ e3} 4.6 \text{ e3}}$	$\frac{\Delta f}{10}$	# ERT 10% 9 13 3.4e3 2.2e3 4.	0% RT _{succ} 6e3 3.1e3	# ERT 15 2.1e4 2	10% 90% 2.0e4 2.1e4	RT _{succ} 2.1e4
1	15 5.6e2 5.3e2 6.0e2 5.6e2	15 8.8e3 8.6e3 9.0e3 8.8e3	1	13 4.1e3 3.0e3 5.	2e3 3.7e3	15 2.5e4 2	2.5e4 2.5e4	2.5e4
1e - 1 1e - 3	15 1.1e3 1.1e3 1.2e3 1.1e3 3 15 2.1e3 2.0e3 2.2e3 2.1e3	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1e-1 1e-3	13 4.6e3 3.6e3 5. 13 5.7e3 4.9e3 6.	7e3 4.1e3 6e3 5.1e3	15 2.9e4 2 14 4.1e4 4	2.9e4 3.0e4 1.0e4 4.1e4	2.9e4 3.8e4
1e - 5	5 13 4.8e3 3.8e3 5.8e3 4.3e3	15 3.0e4 3.0e4 3.1e4 3.0e4	1e - 5	12 7.7e3 6.9e3 8.	5e3 6.0e3	0 34e-5	23e-5 $42e-5$	$3.5 \mathrm{e4}$
1e-3	f3 in 5-D , N=15, mFE=10000	$ f_3 \text{ in } 20\text{-D}, N=15, mFE=40000$	16-3	f_4 in 5-D, N=15,	mFE=10000	f4 in 20-I	, N=15, mF	E=40000
Δf	# ERT 10% 90% RT _{succ}	# ERT 10% 90% RT _{succ}	$\frac{\Delta f}{10}$	# ERT 10% 9	0% RT _{succ}	# ERT	10% 90%	RT _{succ}
1	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	· · · · · · · · · · · · · · · · · · ·	1	0 $69e-1$ $51e-1$ 94	e-1 7.1e3			
1e - 1 1e - 3	3		1e - 1 1e - 3		· ·	· ·	· ·	•
1e - 5	5		1e - 5			· ·	· ·	
1e-8	f_5 in 5-D, N=15, mFE=10000	f5 in 20-D , N=15, mFE=12400	le-8	f_6 in 5-D, N=15,	 mFE=10000	 f6 in 20-I	 D, N=15, mF	E=40000
Δf	# ERT 10% 90% RT _{succ}	# ERT 10% 90% RT _{succ}	Δf	# ERT 10% 9	0% RT _{succ}	# ERT	10% 90%	RT _{succ}
10	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	15 8.0e3 7.7e3 8.3e3 8.0e3	10	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	e + 0 6.3 e2	0 00e+0 2		4.084
1e - 1 1e - 3	12 3.2e3 1.7e3 4.8e3 3.0e3 12 3.2e3 1.7e3 4.8e3 3.0e3	15 8.3e3 8.0e3 8.7e3 8.3e3 15 8 4e3 8 0e3 8 8e3 8 4e3	1e-1 1e-3			· ·	· ·	•
1e - 5	5 12 3.2e3 1.7e3 4.8e3 3.0e3	15 8.4e3 8.0e3 8.8e3 8.4e3	1e - 5					
1e-8	f7 in 5-D, N=15, mFE=10000	15 8.4e3 8.0e3 8.7e3 8.4e3 f7 in 20-D , N=15, mFE=40000	1e-8	f_8 in 5-D. N=15.	mFE=10000	fs in 20-I	 D. N=15. mF	E=40000
Δf	# ERT 10% 90% RT _{succ}	# ERT 10% 90% RT _{succ}	Δf	# ERT 10% 90	0% RT _{succ}	# ERT	10% 90%	RTsucc
10	15 4.7e2 3.0e2 6.8e2 4.7e2 8 1.0e4 7.4e3 1.3e4 4.6e3	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10	8 9.9e3 7.6e3 1.1 0 45e-1 30e-1 28e	2e4 5.6e3 e+0 2.8e3	0 48e+0 1	8e+0 81e+0	4.0e4
1e - 1 1e - 3	1 1.4e5 1.3e5 1.5e5 1.0e4		1e - 1 1e - 3			· ·		
1e - 5 1e - 5	5		1e - 5 1e - 5					
1e-8	f_{0} in 5-D N=15 mEE=10000	[1e-8	f10 in 5-D N=15	 mFE=10000	f_{10} in 20.	 D N=15 m	FE-40000
Δf	# ERT 10% 90% RT _{succ}	# ERT 10% 90% RT _{succ}	Δf	# ERT 10% 90	% RT _{succ}	# ERT	10% 90%	RT _{succ}
10	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10	0 28e+2 30e+1 57e 	+2 1.4e3	0 42e+3 2 	21e+3 11e+4 	3.5e4
1e - 1			1e - 1			· ·		
1e-5 1e-5			1e-5 1e-5					
1e-8		f_{11} in 20-D N=15 mFE=40000	1e-8		mFE=10000	 f12 in 20	 D-D N=15 r	FE=40000
$\Delta f \neq$	# ERT 10% 90% RT _{succ}	# ERT 10% 90% RT _{succ}	Δf	# ERT 10% 90	0% RT _{succ}	# ERT	10% 90%	RT _{succ}
10 5 1 0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10 1	9 1.0e4 8.8e3 1.1 2 6.9e4 6.3e4 7.1	2e4 5.2e3 5e4 7.1e3	12 4.4e4 4 1.5e5	4.3e4 4.5e4 1.5e5 1.5e5	3.5e4 4.0e4
1e-1 .			1e - 1	1 1.4e5 1.4e5 1.5	5e5 1.0e4	0 21e-1	71e-2 15e+1	3.5 e4
1e-5			1e-5	0 716-1 106-2 200	<i>E∓0</i> 0.363	· ·	• •	
						· ·		
1e-8	f12 in 5-D N-15 mEE-10000	fig in 20-D N=15 mEE=40000	1e-8			f14 in 2	 D-D N-15 r	
1e-8 . 1e-8 . f	f13 in 5-D, N=15, mFE=10000 # ERT 10% 90% RT _{succ}	f13 in 20-D, N=15, mFE=40000 # ERT 10% 90% RT _{succ}	1e-8 Δf	f_{14} in 5-D, N=15 # ERT 10% 9	, mFE=10000 0% RT _{succ}	f14 in 20 # ERT	0-D, N=15, r 10% 90%	$\frac{1}{10000}$ nFE=40000 RT _{succ}
1e-8 . 1e-8 . f Δf # 10 5 1 2	$f_{13} \text{ in } 5\text{-}\text{D}, \text{ N}=15, \text{ mFE}=10000$ $\# \text{ ERT } 10\% 90\% \text{ RT}_{\text{succ}}$ $5 2.3e4 2.0e4 2.6e4 7.3e3$ $2 6.9e4 6.3e4 7.5e4 6.9e3$	$\begin{array}{c} & & & & \\ f_{13} \text{ in } 20\text{-}\text{D}, \text{ N}{=}15, \text{ mFE}{=}40000 \\ \# \text{ ERT } 10\% 90\% \text{ RT}_{\text{succ}} \\ 1 5.9e5 5.8e5 6.0e5 4.0e4 \\ 0 49e+0 15e+0 11e+1 3.5e4 \end{array}$	$\frac{\Delta f}{10}$	<i>f</i> 14 in 5-D, N=15 # ERT 10% 9 15 2.9e1 1.6e1 4. 11 4.3e3 2.5e3 6.		$\begin{array}{c} \cdot & \cdot \\ \cdot & \cdot \\ f_{14} \text{ in } 20 \\ \# \text{ ERT} \\ 15 4.1e3 \\ 15 1.6e4 \end{array}$	$\begin{array}{c} \mathbf{0-D, N=15, n} \\ 10\% & 90\% \\ \hline 3.7e3 & 4.5e3 \\ 1.4e4 & 1.8e4 \end{array}$	hFE=40000 RT_{succ} 4.1e3 1.6e4
1e-8 . 1e-8 . f Δf # 10 5 1 2 1e-1 0	$ \begin{array}{c} \textbf{f13 in 5-D, N=15, mFE=10000} \\ \# \ \text{ERT} \ 10\% \ 90\% \ \text{RTsucc} \\ 5 \ 2.3e4 \ 2.0e4 \ 2.6e4 \ 7.3e3 \\ 2 \ 6.9e4 \ 6.3e4 \ 7.5e4 \ 6.9e3 \\ 0 \ 19e+0 \ 75e-2 \ 87e+0 \ 8.9e3 \\ \end{array} $	$\begin{array}{c} \textbf{f_{13} in 20-D, N=15, mFE=40000} \\ \# \ \text{ERT} \ 10\% \ 90\% \ \text{RT}_{\text{succ}} \\ \hline 1 \ 5.9e5 \ 5.8e5 \ 6.0e5 \ 4.0e4 \\ 0 \ 49e+0 \ 15e+0 \ 11e+1 \ 3.5e4 \\ \hline \end{array}$	$\frac{\Delta f}{10}$ $\frac{1}{10}$	$f_{14} \text{ in } 5\text{-}D, N=15$ $\# ERT 10\% 9$ $15 2.9e1 1.6e1 4.$ $11 4.3e3 2.5e3 6.$ $7 1.3e4 1.0e4 1.$ $1 4.4e5 1.4e5 1.$	$\begin{array}{c} & & & \\$	$\begin{array}{c} f_{14} \text{ in } 26 \\ \# \text{ ERT} \\ 15 \text{ 4.1e3} \\ 15 \text{ 1.6e4} \\ 9 \text{ 4.6e4} \\ 0 \text{ 15c} 4 \end{array}$	0-D, N=15, m 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 4.1e4 5.1e4 5.0e4	$\begin{array}{c} \text{nFE}=40000\\ \hline \text{RT}_{\text{succ}}\\ \hline 4.1e3\\ 1.6e4\\ 2.9e4\\ 2.5e4 \end{array}$
$\begin{array}{c c} 1 & 0 & 0 \\ \hline 1 & 1 & 0 \\ \hline \Delta f & \# \\ \hline 10 & 5 \\ 1 & 2 \\ 1 & 2 \\ 1 & 2 \\ 1 & 0 \\ 1 & -1 \\ 0 & 0 \\ 1 & -3 \\ 1 & -5 \\ \end{array}$		$ \begin{array}{c} & & & & & & \\ f_{13} \mbox{ in } 20\text{-}D, \mbox{ N} = 15, \mbox{ mFE} = 40000 \\ \# \mbox{ ERT } 10\% \mbox{ 90\% } \mbox{ RTsucc} \\ \hline 1 \ 5.9e5 \ 5.8e5 \ 6.0e5 \ 4.0e4 \\ 0 \ 49e+0 \ 15e+0 \ 11e+1 \ 3.5e4 \\ & & & & \\ & & & & & \\ \end{array} $	$ \frac{\Delta f}{10} $ $ \frac{1}{10} $	$ \begin{array}{c} f 14 \text{ in } 5\text{-D}, \text{ N=15} \\ \# \text{ ERT } 10\% 9 \\ 15 2.9 \text{e1} 1.6 \text{e1} 4. \\ 11 4.3 \text{e3} 2.5 \text{e3} 6. \\ 7 1.3 \text{e4} 1.0 \text{e4} 1. \\ 1 1.4 \text{e5} 1.4 \text{e5} 1. \\ 1 0 12 \text{e-} 2 13 \text{e-} 4 26 \end{array} $	$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & & $	f14 in 20 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3	$\begin{array}{c} \textbf{0-D, N=15, m} \\ 10\% & 90\% \\ \hline 3.7e3 & 4.5e3 \\ 1.4e4 & 1.8e4 \\ 4.1e4 & 5.1e4 \\ 59e-4 & 27e-2 \end{array}$	$\begin{array}{c} \text{nFE}{=}40000\\ \text{RT}_{\text{succ}}\\ 4.1e3\\ 1.6e4\\ 2.9e4\\ 3.5e4\\ \end{array}$
$\begin{array}{c} 1e-3 & . \\ 1e-8 & . \\ f \\ \hline \\ \Delta f & \# \\ 10 & 5 \\ 1 & 2 \\ 1e-1 & 0 \\ 1e-3 & . \\ 1e-5 & . \\ 1e-8 & . \\ \end{array}$	$ \begin{array}{l} \textbf{f13 in 5-D, N=15, mFE=10000} \\ \textbf{\# ERT 10\% 90\% RT_{SUCC}} \\ \textbf{5 } 2.3e4 2.0e4 2.6e4 7.3e3 \\ \textbf{2 } 6.9e4 6.3e4 7.5e4 6.9e3 \\ \textbf{0 } 19e+0 75e-2 87e+0 8.9e3 \\ \\ \textbf{5 } \\textbf{5 } \\ \textbf{5 } \\ \textbf{5 } \\ \textbf{5 } \\ \textbf{5 } $	$\begin{array}{c} & & & & & \\ f_{13} \text{ in } 20\text{-}\text{D}, \text{ N} = 15, \text{ mFE} = 40000 \\ \# \text{ ERT } 10\% & 90\% & \text{RT}_{\text{succ}} \\ \hline 1 & 5.9e5 & 5.8e5 & 6.0e5 & 4.0e4 \\ 0 & 49e+0 & 15e+0 & 11e+1 & 3.5e4 \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & &$	$ \frac{\Delta f}{10} $ $ \frac{1}{10} $	$\begin{array}{c} f14 \text{ in } 5\text{-}\text{D}, \text{ N}=15\\ \# \text{ ERT} 10\% 9\\ 15 2.9e1 1.6e1 4\\ 11 4.3e3 2.5e3 6\\ 7 1.3e4 1.0e4 1\\ 1.4e5 1.4e5 1\\ 0 12e-2 13e-4 26\\ 0 12e-2 13e-4 26\\ 1.6e 16 5e 16 8\\ 1.6e 16 8e 16\\ 1.6e 16\\$		f14 in 2 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 4.1e4 5.1e4 59e-4 27e-2 	hFE=40000 RT_{succ} 4.1e3 1.6e4 2.9e4 3.5e4 EE=40000
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		$ \begin{array}{c} & & & & & & & \\ f_{13} \ \ \mathbf{in} \ \ 20\text{-}\mathbf{D}, \ \mathbf{N} = 15, \ \mathbf{mFE} = 40000 \\ \# \ \ \mathbf{ERT} \ \ 10\% \ \ 90\% \ \ \mathbf{RT}_{\mathrm{Succ}} \\ 1 \ \ 5.9e5 \ \ 5.8e5 \ \ 6.0e5 \ \ 4.0e4 \\ 0 \ \ 49e+0 \ \ 15e+0 \ \ 11e+1 \ \ 3.5e4 \\ & & & & & \\ & & & & & & \\ & & & & & $	$ \frac{\Delta f}{10} $ $ \frac{\Delta f}{10} $ $ \frac{1}{1e-1} $ $ \frac{1}{1e-3} $ $ \frac{1}{1e-5} $ $ \frac{\Delta f}{1e-8} $	$\begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{e1} \ 1.6 \text{e1} \ 4. \\ 11 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 1 \ 4.10 \text{e4} \ 1.0 \text{e4} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 $	$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & & $	$\begin{array}{c} & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ &$	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 4.1e4 5.1e4 59e-4 27e-2 D-D, N=15, r 10% 90%	$\begin{array}{c} & \vdots \\ nFE=40000 \\ \hline RT_{succ} \\ 4.1e3 \\ 1.6e4 \\ 2.9e4 \\ 3.5e4 \\ \vdots \\ nFE=40000 \\ RT_{succ} \end{array}$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{l} f{13} \mbox{ in 5-D, N=15, mFE=1000} \\ f{13} \mbox{ in 5-D, N=15, mFE=1000} \\ f{23} \mbox{ example 10\% 90\% RT_{\rm Succ}} \\ 5 \mbox{ 2.3e4 } 2.0e4 \mbox{ 2.6e4 } 7.3e3 \\ 2 \mbox{ 6.9e4 } 6.3e4 \mbox{ 7.5e4 } 6.9e3 \\ 0 \mbox{ 19e+0 } 75e-2 \mbox{ 87e+0 } 8.9e3 \\ $	$ \begin{array}{c} & & & & & & & \\ f_{13} & \mathbf{1020-D}, \ \mathbf{N=15}, \ \mathbf{mFE=40000} \\ \# \ \mathbf{ERT} & 10\% & 90\% & \mathbf{RTsucc} \\ \hline 1 & 5.9e5 & 5.8e5 & 6.0e5 & 4.0e4 \\ 0 & 49e+0 & 15e+0 & 11e+1 & 3.5e4 \\ & & & & & & \\ & & & & & & \\ & & & & $	$ \frac{\Delta f}{10} = 8 $ $ \frac{\Delta f}{10} = 1 $ $ \frac{\Delta f}{1e-3} = 5 $ $ \frac{\Delta f}{10} = 1 $ $ 10 $	$\begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{e1} \ 1.6 \text{e1} \ 4. \\ 11 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1.4 \\ 0 \ 12e - 2 \ 13e - 4 \ 26 \\ 1.5 \ 1.4 \ 15e \ 1.4 \\ 15 \ 1.5e \ 1.5e \ 1.4 \\ 15 \ 1.5e $	$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & & $	f14 in 24 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 .	D-D, N=15, n 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 4.1e4 5.1e4 59e-4 27e-2 D-D, N=15, n 10% 90% 17e+0 24e+6	$\begin{array}{c} .\\ nFE=40000\\ \hline RTsucc\\ 4.1e3\\ 1.6e4\\ 2.9e4\\ 3.5e4\\ .\\ nFE=40000\\ \hline RT_{succ}\\ 2.0e4\\ \end{array}$
$\begin{array}{c} 10 - 5 \\ 1e - 8 \\ \end{array}, \\ 10 \\ 5 \\ 1 \\ 10 \\ 1 \\ 2 \\ 1e - 1 \\ 1 \\ 2 \\ 1e - 3 \\ 1e - 5 \\ 1e - 8 \\ \end{array}, \\ \begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1e - 1 \\ 1e - 1 \\ 1e - 1 \\ 1e \\ 1e$	$ \begin{array}{l} \textbf{f13 in 5-D, N=15, mFE=1000} \\ \textbf{f13 in 5-D, N=15, mFE=10000} \\ \textbf{FERT} & 10\% & 90\% & \text{RT}_{\text{succ}} \\ \textbf{5} & 2.3e4 & 2.0e4 & 2.6e4 & 7.3e3 \\ \textbf{2} & 6.9e4 & 6.3e4 & 7.5e4 & 6.9e3 \\ \textbf{0} & 19e+0 & 75e-2 & 87e+0 & 8.9e3 \\ \textbf{0} & 19e+0 & 75e-2 & 87e+0 & 8.9e3 \\ \textbf{0} & 19e+0 & 75e-2 & 87e+0 & 8.9e3 \\ \textbf{0} & 19e+0 & 75e-2 & 87e+0 & 8.9e3 \\ \textbf{0} & \textbf{0} & \textbf{15 in 5-D, N=15, mFE=10000} \\ \textbf{\# ERT} & 10\% & 90\% & \text{RT}_{\text{succ}} \\ \textbf{15 2.4e3} & 2.0e3 & 2.8e3 & 2.4e3 \\ \textbf{0} & 61e-1 & 48e-1 & 78e-1 & 7.1e3 \\ \textbf{0} & \textbf{0} & \textbf{15 2} \\ 16 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2$	$ \begin{array}{c} & & & & & & & \\ f_{13} & 10 & 20\text{-}\mathbf{D}, \ \mathbf{N} = 15, \ \mathbf{mFE} = 40000 \\ \# \ \mathbf{ERT} & 10\% & 90\% & \mathbf{RTsucc} \\ \hline 1 & 5.9e5 & 5.8e5 & 6.0e5 & 4.0e4 \\ 0 & 49e+0 & 15e+0 & 11e+1 & 3.5e4 \\ & & & & & & \\ & & & & & & \\ & & & & $	$ \frac{\Delta f}{10} = 8 $ $ \frac{\Delta f}{10} = 1 $ $ \frac{1}{1e-1} = -3 $ $ \frac{1e-5}{1e-8} = 8 $ $ \frac{\Delta f}{10} = 1 $ $ \frac{1}{1e-1} = -3 $	$\begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \mathrm{e1} \ 1.6 \mathrm{e1} \ 4. \\ 11 \ 4.3 \mathrm{e3} \ 2.5 \mathrm{e3} \ 6. \\ 7 \ 1.3 \mathrm{e4} \ 1.0 \mathrm{e4} \ 1. \\ 1 \ 4.3 \mathrm{e3} \ 2.5 \mathrm{e3} \ 6. \\ 7 \ 1.3 \mathrm{e4} \ 1.0 \mathrm{e4} \ 1. \\ 1 \ 1.4 \mathrm{e5} \ 1.4 \mathrm{e5} \ 1. \\ 1 \ 1.4 \mathrm{e5} \ 1.4 \mathrm{e5} \ 1. \\ 1 \ 1.4 \mathrm{e5} \ 1.4 \mathrm{e5} \ 1. \\ 10 \ 12 \mathrm{e-2} \ 13 \mathrm{e-4} \ 2. \\ 10 \ 12 \mathrm{e-2} \ 13 \mathrm{e-4} \ 2. \\ 10 \ 13 \mathrm{e-2} \ 13 \mathrm{e-4} \ 2. \\ 10 \ 13 \mathrm{e-2} \ 13 \mathrm{e-4} \ 2. \\ 10 \ 5. \ 5. \\ 10 \ 5. \ 5. \\ 10 \ 5. \ 5. \\ 10 \ 5. \ 5. \\ 10 \ 5. \ 5. \ 5. \ 5. \\ 10 \ 5. \ 5. \ 5. \ 5. \ 5. \ 5. \ 5. \ 5$	$\begin{array}{c} & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\$	f14 in 22 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 	D-D, N=15, n 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 4.1e4 5.1e4 59e-4 27e-2 D-D, N=15, n 10% 90% 17e+0 24e+6	$\begin{array}{c} {} {} {} {} {} {} {} {} {} {} {} {} {}$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c} \textbf{f13 in 5-D, N=15, mFE=1000} \\ \textbf{f13 in 5-D, N=15, mFE=1000} \\ \textbf{f13 in 5-D, N=15, mFE=1000} \\ \textbf{5 } 2.3e4 \ 2.0e4 \ 2.6e4 \ 7.3e3 \\ \textbf{2 } 6.9e4 \ 6.3e4 \ 7.5e4 \ 6.9e3 \\ \textbf{0 } 19e+0 \ 75e-2 \ 87e+0 \ 8.9e3 \\ \textbf{.} \\ \textbf$	$\begin{array}{c} & & & & & & \\ f_{13} & \mathbf{1020-} \mathbf{D}, \mathbf{N} \!=\! 15, \mathbf{mFE} \!=\! 40000 \\ \# \mathbf{ERT} 10\% 90\% \mathbf{RTsucc} \\ 1 5.9e5 5.8e5 6.0e5 4.0e4 \\ 0 49e+0 15e+0 11e+1 3.5e4 \\ & & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & &$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \end{array}$ $\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e-3 \\ 1e-5 \end{array}$	$ \begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \mathrm{e1} \ 1.6 \mathrm{e1} \ 4. \\ 11 \ 4.3 \mathrm{e3} \ 2.5 \mathrm{e3} \ 6. \\ 7 \ 1.3 \mathrm{e4} \ 1.0 \mathrm{e4} \ 1. \\ 1 \ 1.4 \mathrm{e5} \ 1.4 \mathrm{e5} \ 1. \\ 10 \ 12 \mathrm{e-2} \ 13 \mathrm{e-4} \ 26 \mathrm{e} \\ . \\ . \\ 10 \ 12 \mathrm{e-2} \ 13 \mathrm{e-4} \ 26 \mathrm{e} \\ . \end{array} $	$\begin{array}{c} & & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & &$	f14 in 2 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 .	0-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 0-D, N=15, r 10% 90% 17e+0 24e+6	$\begin{array}{c} {} & {} \\ {} & {} \\ \mathbf{FE} \!=\! 40000 \\ \mathbf{RT}_{succ} \\ 4.1e3 \\ 1.6e4 \\ 2.9e4 \\ 3.5e4 \\ . \\ \mathbf{nFE} \!=\! 40000 \\ \mathbf{RT}_{succ} \\ 2.0e4 \\ . \\ . \\ . \\ . \\ . \\ . \end{array}$
$\begin{array}{c} \Delta f \\ 1e-8 \\ J \\ 10 \\ 5e \\ 1e \\ 1e \\ 1e \\ 1e \\ 1e \\ 1e \\ 1e$	$ \begin{array}{l} f_{13} \text{ in } 5\text{-D}, \mathrm{N=}15, \mathrm{mFE=}10000 \\ \# \mathrm{ERT} 10\% 90\% \mathrm{RT}_{\mathrm{succ}} \\ 5 2.3\mathrm{e4} 2.0\mathrm{e4} 2.6\mathrm{e4} 7.3\mathrm{e3} \\ 2 6.9\mathrm{e4} 6.3\mathrm{e4} 7.5\mathrm{e4} 6.9\mathrm{e3} \\ 0 19e+0 75e-2 87e+0 8.9\mathrm{e3} \\ & & & & & & & \\ f_{15} \mathrm{in} 5\text{-D}, \mathrm{N=}15, \mathrm{mFE=}10000 \\ \# \mathrm{ERT} 10\% 90\% \mathrm{RT}_{\mathrm{succ}} \\ 15 2.4\mathrm{e3} 2.0\mathrm{e3} 2.8\mathrm{e3} 2.4\mathrm{e3} \\ 0 61e-1 48e-1 78e-1 7.1\mathrm{e3} \\ & & & & & & \\ & & & & & & & \\ & & & & & & & \\ f_{17} \mathrm{in} 5\text{-D}, \mathrm{N=}15, \mathrm{mFE=}10000 \\ \end{array} $	$\begin{array}{c} & & & & & & & \\ f_{13} & \mathbf{1020-} \mathbf{D}, \mathbf{N=15}, \mathbf{mFE=40000} \\ \# \ \mathbf{ERT} 10\% 90\% \ \mathbf{RTsucc} \\ 1 5.9e5 5.8e5 6.0e5 4.0e4 \\ 0 49e+0 15e+0 11e+1 3.5e4 \\ & & & & & \\ & & & & & \\ & & & & & \\ f_{15} \mathbf{in} \mathbf{20-} \mathbf{D}, \mathbf{N=15}, \mathbf{mFE=40000} \\ \# \ \mathbf{ERT} 10\% 90\% \ \mathbf{RTsucc} \\ 0 93e+0 83e+0 11e+1 2.8e4 \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\$	$\frac{\Delta f}{10} = \frac{1}{10}$ $\frac{\Delta f}{10} = \frac{1}{10}$ $\frac{\Delta f}{10} = \frac{1}{10}$ $\frac{\Delta f}{10} = \frac{1}{10}$ $\frac{1}{10} = \frac$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.4 \text{es} \ 1.6 \text{el} \ 1.6 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.6 \text{el} \ 1.6 \text$		f14 in 2 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 . . f16 in 2l # ERT 0 2le+0 .	0-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 0-D, N=15, r 10% 90% 17e+0 24e+0 	$\begin{array}{c} {}_{\rm nFE=40000} \\ {}_{\rm RTsucc} \\ {}_{\rm 4.1e3} \\ {}_{\rm 1.6e4} \\ {}_{\rm 2.9e4} \\ {}_{\rm 3.5e4} \\ {}_{\rm} \\ {}_{\rm nFE=40000} \\ {}_{\rm RTsucc} \\ {}_{\rm} \end{array}$
$\begin{array}{c} \Delta f \\ 1e-8 \\ J \\ 10 \\ 10 \\ 5 \\ 1e-1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ J \\ \Delta f \\ 4 \\ 10 \\ 1e-1 \\ 1e-1 \\ 1e-3 \\ 1e-5 \\ 1e-8 \\ J \\ \Delta f \\ 4 \\ J \\ J$	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	$ \begin{array}{c} & & & & & & & \\ f_{13} & \mathbf{1020-} \mathbf{D}, \mathbf{N=15}, \mathbf{mFE=40000} \\ \# \ \mathbf{ERT} 10\% 90\% \ \mathbf{RTsucc} \\ 1 \ 5.9e5 \ 5.8e5 \ 6.0e5 \ 4.0e4 \\ 0 \ 49e+0 \ 15e+0 \ 11e+1 \ 3.5e4 \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ f_{15} \mathbf{in} \mathbf{20-} \mathbf{D}, \mathbf{N=15}, \mathbf{mFE=40000} \\ \# \ \mathbf{ERT} \ 10\% \ 90\% \ \mathbf{RTsucc} \\ 0 \ 93e+0 \ 83e+0 \ 11e+1 \ 2.8e4 \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & $	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \hline 10 \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ \hline \Delta f \end{array}$	$ \begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{e1} \ 1.6 \text{e1} \ 4. \\ 11 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 10 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 11 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 10 \ 12 \text{e-}^2 \ 13 \text{e-}^4 \ 26 \\ . \ . \ . \ . \\ 716 \ \mathbf{in} \ \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 6.9 \text{e2} \ 4.9 \text{e2} \ 8. \\ 0 \ 35 \text{e-}^1 \ 25 \text{e-}^1 \ 65 \\ . \ . \ . \ . \\ . \ . \ . \\ 11 \ 11 \ \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ \end{array} $	$\begin{array}{c} & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & & \\ &$	f14 in 2 # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 . . f16 in 24 # ERT 0 21e+0 .	0-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 0-D, N=15, r 10% 90% 10% 90%	$\begin{array}{c} {}_{\rm nFE=40000} \\ {}_{\rm RTsucc} \\ {}_{\rm 4.1e3} \\ {}_{\rm 1.6e4} \\ {}_{\rm 2.9e4} \\ {}_{\rm 3.5e4} \\ {}_{\rm} \\ {}_{\rm nFE=40000} \\ {}_{\rm RTsucc} \\ {}_{\rm} \\ {}_{\rm} \\ {}_{\rm} \\ {}_{\rm nFE=40000} \\ {}_{\rm RTsucc} \end{array}$
$\begin{array}{c} \Delta f \\ \mu = 8 \\ \lambda f \\ \mu \\$	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	$ \begin{array}{c} & & & & & & & & \\ f_{13} & 10 & 20\text{-}\mathbf{D}, \ \mathbf{N} = 15, \ \mathbf{mFE} = 40000 \\ \# \ \mathbf{ERT} & 10\% & 90\% \ \mathbf{RTsucc} \\ 1 & 5.9e5 & 5.8e5 & 6.0e5 & 4.0e4 \\ 0 & 49e+0 & 15e+0 & 11e+1 & 3.5e4 \\ & & & & & & \\ & & & & & & \\ & & & & $	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 1 \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ \end{array}$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{e1} \ 1.6 \text{e1} \ 4. \\ 11 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1.4 \\ 10 \ 12e - 2 \ 13e - 4 \ 26 \\ . \ . \ . \ . \ . \ . \ . \ . \ . \ .$	$\begin{array}{c} & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & & \\ & & &$	$\begin{array}{c} \mathbf{f}_{14} \; \mathbf{in} \; 2 \\ \# \; \mathrm{ERT} \\ 15 \; 4.1\mathrm{e3} \\ 15 \; 4.1\mathrm{e3} \\ 15 \; 4.1\mathrm{e3} \\ 15 \; 4.1\mathrm{e3} \\ 16 \; 4.1\mathrm{e3} \\ 0 \; 15\mathrm{e}^{-3} \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ . \\ $	0-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 0-D, N=15, r 10% 90% 17e+0 24e+0 0-D, N=15, r 10% 90% 9.0e3 9.9e3 9.0e3 9.9e3	$\begin{array}{c} {}_{\rm A}{\rm FE}{=}40000\\ {\rm RT}_{\rm succ}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {\rm .}\\ {\rm .}\\ {\rm RT}_{\rm succ}\\ {\rm 2.0e4}\\ {\rm .}\\ {$
$\begin{array}{c} \Delta f \\ \mu = 8 \\ \lambda f \\ \mu \\$	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ -8 \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-1$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{e1} \ 1.6 \text{e1} \ 4. \\ 11 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1.4 \\ 10 \ 12e - 2 \ 13e - 4 \ 26 \\ . \ . \ . \ . \ . \ . \ . \ . \ . \ .$	$\begin{array}{c} & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & \\ & & & &$	$ \begin{array}{c} \mathbf{f14 \ in \ 2}\\ \# \ \mathrm{ERT}\\ 15 \ 4.1e3\\ 16 \ 1.6e4\\ 9 \ 4.6e4\\ 0 \ 15e-3\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$	0-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 0-D, N=15, r 10% 90% 17e+0 24e+0 0-D, N=15, r 10% 90% 9.0e3 9.9e3 9.0e3 9.9e3 6.3e4 7.0e4 35e-2 16e-1	$\begin{array}{c} {}_{\rm AFE=40000}\\ {}_{\rm RTsucc}\\ {}_{\rm 4.1e3}\\ {}_{\rm 1.6e4}\\ {}_{\rm 2.9e4}\\ {}_{\rm 3.5e4}\\ {}_{\rm}\\ {}_{\rm AFE=40000}\\ {}_{\rm RTsucc}\\ {}_{\rm 2.0e4}\\ {}_{\rm}\\ {}_{\rm}\\ {}_{\rm}\\ {}_{\rm AFE=40000}\\ {}_{\rm RTsucc}\\ {}_{\rm 9.4e3}\\ {}_{\rm 3.6e4}\\ {}_{\rm 3.5e4}\\ {}_{\rm 3.5e4}\\ \end{array}$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \hline 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \hline \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{$	$ \begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{e1} \ 1.6 \text{e1} \ 4. \\ 11 \ 4.3 \text{e3} \ 2.5 \text{e3} \ 6. \\ 7 \ 1.3 \text{e4} \ 1.0 \text{e4} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5} \ 1. \\ 1 \ 1.4 \text{e5} \ 1.4 \text{e5}$	$\begin{array}{c} & & & & & & \\ & & & & & & \\ & & & & & $	$ \begin{array}{c} \mathbf{f14 \ in \ 2}\\ \mathbf{\# \ ERT}\\ 15 \ 4.1\mathbf{e3}\\ 16 \ \mathbf{e4}\\ 9 \ 4.6\mathbf{e4}\\ 0 \ 15\mathbf{e-3}\\ & & \\ 16 \ \mathbf{n24}\\ \mathbf{\# \ ERT}\\ 0 \ 21\mathbf{e+0}\\ & & \\ 16 \ \mathbf{n24}\\ \mathbf{\# \ ERT}\\ 15 \ 9.4\mathbf{e3}\\ 8 \ 6.7\mathbf{e4}\\ 0 \ 95\mathbf{e-2}\\ & & \\ . $	0-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 0-D, N=15, r 10% 90% 17e+0 24e+6 0-D, N=15, r 10% 90% 9.0e3 9.9e3 9.0e3 9.9e3 6.3e4 7.0e4 35e-2 16e-1	$\begin{array}{c} {}_{\rm A}{\rm FE}{=}40000\\ {\rm RT}_{\rm succ}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {\rm .}\\ {\rm aFE}{=}40000\\ {\rm RT}_{\rm succ}\\ {\rm 2.0e4}\\ {\rm .}\\ {\rm .}$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.6 \text{el} \ 4. \\ 1 \ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.6 \text{el} \ 4. \\ 1 \ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.6 \text{el} \ 1.6 \text{el} \ 4. \\ 1 \ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.6 \text{el} \ 1$		$ \begin{array}{c} \mathbf{f}_{14} \ \mathbf{in} \ 2 \\ \# \ \mathbf{ERT} \\ 15 \ \mathbf{4.1c3} \\ 16 \ 16 \\ 16 \ 16 \\ 16$	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 D-D, N=15, r 10% 90% 17e+0 24e+0 D-D, N=15, r 10% 90% 9.0e3 9.9e3 9.9e3 9.9e3 D-D, N=15, r 10% 90% 9.0e3 9.9e3 D-D, N=15, r 10% 90% 9.0e3 9.9e3 	$\begin{array}{c} {}_{\rm nFE=40000}\\ {\rm RT_{\rm succ}}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {\rm .}\\ {\rm nFE=40000}\\ {\rm RT_{\rm succ}}\\ {\rm 2.0e4}\\ {\rm .}\\ {\rm .}\\$
$\begin{array}{c} L = -8 & J \\ \hline \hline & J \\ \hline & J \\ \hline & J \\ \hline \hline & J \\ \hline \hline & J \\ \hline & J \\ \hline \hline \hline \hline \hline \hline & J \\ \hline \hline$	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} $	$\begin{array}{c} & & & & & \\ & & & & \\ & & & \\ & & & & \\ & &$	$ \begin{array}{c} \mathbf{f14 \ in \ 2}\\ \mathbf{f14 \ in \ 2}\\ \mathbf{\# \ ERT}\\ 15 \ 4.1e3\\ 15 \ 1.6e4\\ 9 \ 4.6e4\\ 0 \ 15e-3\\ & \\ \mathbf{f16 \ in \ 2}\\ \mathbf{\# \ ERT}\\ 0 \ 21e+0\\ & \\ \mathbf{f16 \ in \ 2}\\ \mathbf{\# \ ERT}\\ 15 \ 9.4e3\\ 8 \ 6.7e4\\ 0 \ 95e-2\\ & \\ \mathbf{f18 \ in \ 2}\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{f16 \ in \ 2}\\ \mathbf{H \ ERT}\\ 15 \ 9.4e3\\ \mathbf{H \ ERT}\\ \mathbf{H \ ERT}$ \mathbf{H \ ERT}	$\begin{array}{c} \text{0-D}, \ N=15, \ r\\ 10\% & 90\%\\ 3.7e3 & 4.5e3\\ 1.4e4 & 1.8e4\\ 59e-4 & 27e-2\\ 0.5ex\\ 0.5ex\\ 0.5ex\\ 10\% & 90\%\\ 17e+0 & 24e+6\\ 0.5ex\\ 0.5e$	$\begin{array}{c} {}_{\rm nFE=40000}\\ {\rm RT_{\rm succ}}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {\rm .}\\ {\rm nFE=40000}\\ {\rm RT_{\rm succ}}\\ \hline \\ {\rm 2.0e4}\\ {\rm .}\\ {\rm$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} $	$\begin{array}{cccc} & & & & & & & & & & & & \\ & & & & & & $	$\begin{array}{c} \mathbf{f}_{14} \ \mathbf{in} \ 2 \\ \# \ \mathbf{ERT} \\ 15 \ \mathbf{4.1e3} \\ 16 \ \mathbf{n} \ 24 \\ \# \ \mathbf{ERT} \\ 0 \ \mathbf{21e+0} \\ 0 \ \mathbf{31e+0} \\ 15 \ \mathbf{9.4e3} \\ 8 \ \mathbf{6.7e4} \\ 0 \ \mathbf{95e-2} \\ 0 \ . \\ 15 \ \mathbf{9.4e3} \\ 8 \ \mathbf{6.7e4} \\ 0 \ \mathbf{95e-2} \\ . \\ . \\ 15 \ \mathbf{4.0e3} \\ 15 \ \mathbf{4.0e3} \\ 15 \ \mathbf{4.0e3} \\ 0 \ \mathbf{31e-1} \\ \mathbf{15e-1} \\ 15e-1$	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 4.1e4 5.1e4 59e-4 27e-2 D-D, N=15, r 10% 90% 17e+0 24e+6 D-D, N=15, r 10% 90% 3.9e3 9.9e3 D-D, N=15, r 10% 90% 3.9e3 4.2e3 3.9e-1 32e-1	$\begin{array}{c} {}_{\rm AFE=40000}\\ {\rm RT_{Succ}}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {\rm$
$\begin{array}{c} L = 8 \\ 1 = 8 \\ 1 \\ 1 \\ 0 \\ 1 \\ 1 \\ 0 \\ 1 \\ 1 \\ 1 \\ 0 \\ 1 \\ 1$	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{c} \mathbf{f_{13}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \mathbf{f_{15}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \mathbf{f_{15}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \mathbf{f_{17}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \mathbf{f_{17}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \mathbf{f_{17}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \mathbf{f_{15}\ 1.2e3\ 9.5e2\ 1.5e3\ 1.2e3} \\ \mathbf{f_{15}\ 1.2e3\ 9.5e2\ 1.5e3\ 1.2e3} \\ \mathbf{f_{15}\ 1.2e3\ 9.5e2\ 1.5e3\ 1.2e3} \\ \mathbf{f_{16}\ 1.9e5\ 2.0e5\ 3.5e4} \\ \mathbf{0\ 15e-2\ 56e-3\ 48e-2\ 3.5e4} \\ \mathbf{0\ 15e-2\ 56e-3\ 48e-2\ 3.5e4} \\ \mathbf{0\ 15e-2\ 56e-3\ 48e-2\ 3.5e4} \\ \mathbf{0\ 41e-1\ 33e-1\ 44e-1\ 2.8e4} \\ \mathbf{0\ 41e-1\ 33e-1\ 44e-1\ 2.8e4} \\ \end{array}$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 1 \ 1.4 \text{es} \ 1.4 $	$\begin{array}{ccccc} & & & & & & & & & & & & & & & & &$	$ \begin{array}{c} \mathbf{f14 \ in \ 2}\\ \mathbf{f14 \ in \ 2}\\ \mathbf{FERT}\\ 15 \ 4.1e3\\ 15 \ 1.6e4\\ 9 \ 4.6e4\\ 0 \ 15e-3\\ .\\ \mathbf{f16 \ in \ 2}\\ \mathbf{f16 \ in \ 2}\\ \mathbf{FERT}\\ \hline 0 \ 2Ie+0\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\ .\\$	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 D-D, N=15, r 10% 90% 17e+0 24e+6 6.3e4 7.0e4 35e-2 16e-1 D-D, N=15, r 10% 90% 3.9e3 4.2e3 30e-1 32e-1	$\begin{array}{c} {}_{\rm AFE=40000}\\ {\rm RT}_{\rm Succ}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {\rm .}\\ {\rm aFE=40000}\\ {\rm RT}_{\rm Succ}\\ \hline {\rm 2.0e4}\\ {\rm .}\\ {\rm .$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{c} & & & & & & & & & & & & & & \\ f_{13} & & & & & & & & & & & & & \\ f_{13} & & & & & & & & & & & \\ p_{\rm ERT} & & & & & & & & & & \\ 1 & 5.9e5 & 5.8e5 & 6.0e5 & 4.0e4 \\ 0 & & & & & & & & & & & \\ 0 & & & & &$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 11 \ 4.4 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 5.1 \text{oles} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{el} \ 1.4 \text{el} \ 1.0 \text{el} \ 1. \\ 11 \ 1.4 \text{es} \ 1.4 \text{es} \ 1.4 \text{el} \ 1.4 $	$\begin{array}{cccccc} & & & & & & & & & & & & & & & & $	$ \begin{array}{c} \mathbf{f14 \ in \ 2}\\ \mathbf{f14 \ in \ 2}\\ \mathbf{FERT}\\ 15 \ 4.1e3\\ 15 \ 1.6e4\\ 9 \ 4.6e4\\ 0 \ 15e-3\\ & & \\ \mathbf{f16 \ in \ 2l}\\ \mathbf{\# \ ERT}\\ 0 \ 2le+0\\ & & \\ \mathbf{f16 \ in \ 2l}\\ \mathbf{\# \ ERT}\\ 0 \ 2le+0\\ & & \\ \mathbf{f18 \ in \ 2l}\\ \mathbf{\# \ ERT}\\ 15 \ 9.4e3\\ 8 \ 6.7e4\\ 0 \ 95e-2\\ & & \\ \mathbf{f20 \ in \ 2l}\\ \mathbf{\# \ ERT}\\ 15 \ 4.0e3\\ 0 \ 3le-1\\ & \\ \mathbf{f18 \ in \ 2l}\\ \mathbf{H \ ERT}\\ 15 \ 4.0e3\\ 0 \ 3le-1\\ & \\ \mathbf{f18 \ in \ 2l}\\ \mathbf{H \ ERT}\\ 15 \ 4.0e3\\ 0 \ 3le-1\\ & \\ \mathbf{f18 \ in \ 2l}\\ \mathbf{H \ ERT}\\ 15 \ 4.0e3\\ 0 \ 3le-1\\ & \\ \mathbf{f18 \ in \ 2l}\\ \mathbf{H \ ERT}\\ 15 \ 4.0e3\\ 0 \ 3le-1\\ & \\ \mathbf{H \ ERT}\\ 15 \ 4.0e3\\ 0 \ 3le-1\\ & \\ \mathbf{H \ ERT}\\ \mathbf{H \ ERT}$ \mathbf{H \ ERT} \mathbf{H \ ERT} \mathbf{H \ ERT} H	$\begin{array}{c} 0\text{-D}, \mathbf{N} = 15, \\ 10\% & 90\% \\ 3.7e3 & 4.5e3 \\ 1.4e4 & 1.8e4 \\ 59e-4 & 27e-2 \\ \hline \\ 0\text{-D}, \mathbf{N} = 15, \\ 10\% & 90\% \\ 17e+0 & 24e+6 \\ \hline \\ 0\text{-D}, \mathbf{N} = 15, \\ 10\% & 90\% \\ 17e+0 & 24e+6 \\ \hline \\ 0\text{-D}\text{-D}, \mathbf{N} = 15, \\ 10\% & 90\% \\ 3.9e3 & 9.9e3 \\ 35e-2 & 16e-1 \\ \hline \\ 0\text{-D}\text{-D}, \mathbf{N} = 15, \\ 10\% & 90\% \\ 3.9e3 & 4.2e3 \\ 30e-1 & 32e-1 \\ \hline \\ \end{array}$	$\begin{array}{c} {}_{\rm A}{\rm FE}{=}40000\\ {\rm RT}_{\rm Succ}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm .}\\ {$
$\begin{array}{c} L = -8 & J \\ \hline \hline & J \\ \hline & J \\ \hline & J \\ \hline \hline \hline \hline & J \\ \hline \hline \hline \hline \hline & J \\ \hline \hline$	$f_{13} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000 \\ \neq \text{ ERT } 10\% 90\% \text{ RT}_{\text{succ}} \\ 5 2.3 \text{e} 4 2.0 \text{e} 4 2.6 \text{e} 7.3 \text{e} 3 \\ 2 6.9 \text{e} 4 6.3 \text{e} 4 7.5 \text{e} 4 6.9 \text{e} 3 \\ 0 19e+0 75e-2 87e+0 8.9 \text{e} 3 \\ 10000000000000000000000000000000000$	$\begin{array}{c} & & & & & & & & & & & & & \\ f_{13} \ in \ 20-D, \ N=15, \ mFE=40000 \\ \# \ ERT \ 10\% \ 90\% \ RT_{Succ} \\ 1 \ 5.9e5 \ 5.8e5 \ 6.0e5 \ 4.0e4 \\ 0 \ 49e+0 \ 15e+0 \ 11e+1 \ 3.5e4 \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & & \\ & & & & & & & & &$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } \mathbf{5\text{-}}\mathbf{D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 1.0 \text{el} \ 1. \\ 11 \ 4.4 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 5.1 \text{el} \ 5.1 \\ 10 \ 12e^{-2} \ 13e^{-2} \ 26e^{-2} \\ 10 \ 35e^{-1} \ 25e^{-1} \ 65e^{-2} \\ 10 \ 35e^{-1} \ 25e^{-1} \ 65e^{-2} \\ 10 \ 35e^{-1} \ 25e^{-1} \ 65e^{-2} \\ 10 \ 35e^{-1} \ 25e^{-2} \ 5e^{-2} \\ 10 \ 31e^{-2} \ 31e^{-2} \ 5e^{-2} \\ 10 \ 10 \ 9 \\ 15 \ 4.6 \text{ee}^{2} \ 3.7 \text{ee}^{2} \\ 10 \ 5 \ \mathbf{D}, \ \mathbf{N=15} \\ 14 \ 3.6 \text{es}^{3} \ 31e^{-2} \ 4.2 \text{ed} \\ 10 \ 14e^{-2} \ 73e^{-4} \ 68e^{-2} \\ 10 \ 5 \ \mathbf{D}, \ \mathbf{N=15} \\ 10 \ 10 \ 5 \ \mathbf{D}, \ \mathbf{N=15} \\ 10 \ 10 \ 26e^{-1} \ 16e^{-1} \ 25e^{-2} \\ 10 \ 2e^{-1} \ 16e^{-1} \ 25e^{-2} \\ 10 \ 5 \ \mathbf{D}, \ \mathbf{N=15} \\ 10 \ 26e^{-1} \ 16e^{-1} \ 25e^{-2} \\ 10 \ 10 \ 5 \ \mathbf{D}, \ \mathbf{N=15} \\ 10 \$	$\begin{array}{cccccccc} & & & & & & & & & & & & & & & $	$ \begin{array}{c} \mathbf{f}_{14} \ \mathbf{in} \ 2' \\ \# \ \mathbf{ERT} \\ 15 \ 4.1\mathbf{e3} \\ 15 \ 9.1\mathbf{e3} \\ 15 \ 9.1\mathbf{e3} \\ 15 \ 9.1\mathbf{e3} \\ 15 \ 9.1\mathbf{e3} \\ 8 \ 6.7\mathbf{e4} \\ 0 \ 95\mathbf{e} - 2 \\ . \\ . \\ 15 \ 4.1\mathbf{e3} \\ 15 \ 9.1\mathbf{e3} \\ 8 \ 6.7\mathbf{e4} \\ 0 \ 95\mathbf{e} - 2 \\ . \\ $	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 D-D, N=15, r 10% 90% 17e+0 24e+0 0.00	$\begin{array}{c} {} {} {} {} {} {} {} {} {} {} {} {} {}$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$f_{13} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000 \\ $	$\begin{array}{c} & & & & & & & & & & & & & & \\ f_{13} & & & & & & & & & & & & & \\ f_{13} & & & & & & & & & & & \\ p & & & & & & &$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{el} \ 1.6 \text{el} \ 4. \\ 11 \ 4.3 \text{es} \ 2.5 \text{es} \ 6. \\ 7 \ 1.3 \text{el} \ 2.5 \text{es} \ 6. \\ 1.1 \ 1.4 \text{es} \ 2.5 \text{es} \ 3.6 \\ 7 \ 1.3 \text{el} \ 5.1 \text{es} \ 4.9 \text{es} \ 2.5 \\ 16 \ 1 \ 5.5 \ 1.4 \ 5.6 \ 1.4 \ 5.6 \\ 16 \ \mathbf{10\%} \ 5 \ \mathbf{10\%} \ \mathbf{11\%} \ \mathbf{10\%} \ \mathbf{11\%} \ \mathbf{10\%} \ \mathbf$	$\begin{array}{c} & & & & & & \\ & & & & & & & \\ & & & & $	$\begin{array}{c} \mathbf{f14 \ in \ 2}\\ \mathbf{f14 \ in \ 2}\\ \mathbf{FERT}\\ \mathbf{15 \ 4.1e3}\\ \mathbf{8 \ 6.7e4}\\ \mathbf{0 \ 95e-2}\\ \\ \mathbf{15 \ 9.4e3}\\ \mathbf{8 \ 6.7e4}\\ \mathbf{0 \ 95e-2}\\ \\ \mathbf{15 \ 4.0e3}\\ \mathbf{0 \ 3le-1}\\ \\ \\ \mathbf{15 \ 4.0e3}\\ \mathbf{0 \ 3le-1}\\ $	D-D, N=15, r 10% 90% 3.7e3 4.5e3 1.4e4 1.8e4 59e-4 27e-2 D-D, N=15, r 10% 90% 17e+0 24e+0 0.00 10% 90% 100 90% 3.9e3 4.2e3 30e-1 32e-1 0.00 0.00 10% 90% 10% 9	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$f_{13} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000$ $f = \text{ERT} = 10\% = 90\% \text{ RT}_{\text{succ}}$ $f = 2.3e4 = 2.0e4 = 2.6e4 = 7.3e3$ $2 = 6.9e4 = 6.3e4 = 7.5e4 = 6.9e3$ $0 = 19e+0 = 75e-2 = 87e+0 = 8.9e3$ $f_{15} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000$ $f = \text{ERT} = 10\% = 90\% \text{ RT}_{\text{succ}}$ $f_{15} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000$ $f = \text{ERT} = 10\% = 90\% \text{ RT}_{\text{succ}}$ $f_{15} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000$ $f = \text{ERT} = 10\% = 90\% \text{ RT}_{\text{succ}}$ $f_{15} \text{ in } 5\text{-} \text{D}, \text{N}=15, \text{mFE}=10000$ $f = \text{ERT} = 10\% = 90\% \text{ RT}_{\text{succ}}$ $f_{15} \text{ in } 16\% = 1.4e1 = 1.1e1$ $1.5 = 1.4e3 = 1.6e3 = 1.4e3$ $1.4 = 3.1e3 = 1.6e3 = 1.4e3$ $1.4 = 3.6e3 = 4.6e3 = 4.6e3$ $5 = 2.8e4 = 2.6e4 = 2.9e4 = 9.9e3$ $0 = 47e-4 = 64e-6 = 73e-3 = 8.9e3$ $1.5 = 1.6e3 = 2.7e3 = 2.1e3$ $0 = 45e-2 = 20e-2 = 73e-2 = 6.3e3$ $1.5 = 1.6e3 = 2.7e3 = 2.1e3$ $0 = 45e-2 = 20e-2 = 73e-2 = 6.3e3$ $1.5 = 1.6e3 = 1.7e2$ $1.3e2 = 2.2e2 = 1.7e2$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ 1e^{-8}$	$ \begin{array}{c} f14 \ \text{in } 5\text{-D}, \ N=15 \\ \# \ \text{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{cl} \ 1.6 \text{cl} \ 4. \\ 11 \ 4.3 \text{cs} \ 2.5 \text{cs} \ 6. \\ 7 \ 1.3 \text{cs} \ 4.10 \text{cs} \ 1.4 \\ 10 \ 4.3 \text{cs} \ 2.5 \text{cs} \ 6. \\ 10 \ 12e-2 \ 13e-4 \ 2.6 \ 4. \\ 11 \ 1.4 \ 5.1 \ 4.6 \ 5.1 \\ 10 \ 12e-2 \ 13e-4 \ 2.6 \ 4. \\ 10 \ 12e-2 \ 13e-4 \ 2.6 \ 4. \\ 10 \ 35e-1 \ 25e-1 \ 65 \\ . \ . \ . \ . \ . \ . \ . \\ 11 \ 5e-1 \ 25e-1 \ 65 \\ . \ . \ . \ . \ . \ . \ . \\ 11 \ 5e-1 \ 25e-1 \ 65 \\ . \ . \ . \ . \ . \ . \ . \ . \ . \\ 11 \ 5e-1 \ 25e-1 \ 65 \\ . \ . \ . \ . \ . \ . \ . \ . \ . \\ 11 \ 5e-1 \ 25e-1 \ 65 \\ . \ . \ . \ . \ . \ . \ . \ . \ . \ .$	$\begin{array}{cccccc} & & & & & & & & & & & & & & & & $	$\begin{array}{c} \mathbf{f}_{14} \; \mathbf{in} \; 2'\\ \# \; \mathbf{ERT}\\ 15 \; \mathbf{4.1e3}\\ 15 \; \mathbf{1.6e4}\\ 9 \; \mathbf{4.6e4}\\ 0 \; \mathbf{15e}{-3}\\ .\\ $	$\begin{array}{c} \text{0-D}, \mathbf{N}=15, \\ 10\% & 90\% \\ 3.7\text{cs} & 4.5\text{cs} \\ 1.4\text{cs} & 1.8\text{cs} \\ 4.1\text{cs} & 5.1\text{cs} \\ 59e-4 & 27e-2 \\ & & & & \\ 59e-4 & 27e-2 \\ & & & & \\ 10\% & 90\% \\ 17e+0 & 24e+6 \\ & & & & \\ 10\% & 90\% \\ 17e+0 & 24e+6 \\ & & & & \\ 10\% & 90\% \\ 9.0\text{cs} & 3.9\text{cs} \\ 3.9\text{cs} & 1.6\text{cs} \\ 10\% & 90\% \\ 3.9\text{cs} & 4.2\text{cs} \\ 3.9\text{cs} & 4.2\text{cs} \\ 3.9\text{cs} & 1.2\text{cs} \\ 10\% & 90\% \\ 1.2\text{cs} & 1.9\text{cs} \\ 1.5\text{cs} & 1.9\text{cs} \\ \end{array}$	$\begin{array}{c} & & & & \\ \mathbf{n} \mathbf{FE} = 40000 \\ \mathbf{RT}_{\mathbf{Succ}} \\ & & \mathbf{4.1e3} \\ & & \mathbf{1.6e4} \\ & & \mathbf{2.9e4} \\ & & \mathbf{3.5e4} \\ & & . \\ & & \mathbf{n} \mathbf{FE} = 40000 \\ \mathbf{RT}_{\mathbf{Succ}} \\ & & \mathbf{2.0e4} \\ & & . \\ & & . \\ & & \mathbf{n} \mathbf{FE} = 40000 \\ \mathbf{RT}_{\mathbf{Succ}} \\ & & \mathbf{9.4e3} \\ & & \mathbf{3.5e4} \\ & & . \\ & & \mathbf{n} \mathbf{FE} = 40000 \\ \mathbf{RT}_{\mathbf{Succ}} \\ & & \mathbf{4.0e3} \\ & & \mathbf{6.3e3} \\ & & \mathbf{6.3e3} \\ & & . \\ & & . \\ & & \mathbf{n} \mathbf{FE} = 40000 \\ \mathbf{RT}_{\mathbf{Succ}} \\ \mathbf{1.5e4} \\ & \mathbf{4.0e4} \\ \end{array}$
$\begin{array}{c} 1e - 8 \\ 1e - 8 \\ 1e - 8 \\ 10 \\ 10 \\ 1e - 1 \\ 1e - 1 \\ 1e - 1 \\ 1e - 3 \\ 1e - 5 \\ 1e - 8 \\ 10 \\ 1e - 3 \\ 1e - 5 \\ 1e - 8 \\ 10 \\ 1e - 1 \\ 1e - 3 \\ 1e - 5 \\ 1e - 8 \\ 10 \\ 1e - 1 \\ 1e - 1 \\ 1e - 3 \\ 1e - 5 \\ 1e - 8 \\ 10 \\ 1e - 1 \\ 1e$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-1$	$ \begin{array}{c} f14 \ \text{in } 5\text{-D}, \ \text{N=15} \\ \# \ \text{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{cl} \ 1.6 \text{cl} \ 4. \\ 11 \ 4.3 \text{cs} \ 2.5 \text{cs} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 4.4 \text{cs} \ 2.5 \text{cs} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 4.4 \text{cs} \ 2.5 \text{cs} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1.4 \text{cs} \ 1.5 \ 1.4 \ 0.6 \text{cd} \ 1. \\ 11 \ 1.4 \text{cs} \ 1.5 \ 1.4 \ 0.5 \ 1.5 $	$\begin{array}{ccccc} & & & & & & & & & & & & & & & & &$	$\begin{array}{c} \mathbf{f}_{14} \; \mathbf{in} \; 2'\\ \# \; \mathbf{ERT}\\ 15 \; \mathbf{4.1e3}\\ 15 \; \mathbf{1.6e4}\\ 9 \; \mathbf{4.6e4}\\ 0 \; \mathbf{15e}^{-3}\\ & & \\ &$	$\begin{array}{c} \text{0-D}, \mathbf{N}=15, \mathbf{r}\\ 10\% & 90\%\\ 3.7c3 & 4.5c3\\ 1.4c4 & 1.8c4\\ 59e-4 & 27e-2\\ 2.7c-2\\ 2.7$	$\label{eq:response} \begin{array}{c} {} & {} & {} & {} & {} & {} & {} & {$
$\begin{array}{c} 1e - 8 & . \\ 1e - 8 & . \\ 10 & 5 \\ 1 & 2 \\ 10 & 5 \\ 1 & 2 \\ 1e - 1 & 0 \\ 1e - 3 & . \\ 1e - 5 & . \\ 1e - 8 & . \\ 1e - 8 & . \\ 1e - 8 & . \\ 1e - 1 & . \\ 1e - 3 & . \\ 1e - 5 & . \\ 1e - 8 & . \\ 1e - 1 & . \\ 1e - 8 & . \\ 10 & 1 & 1 \\ 1 & 1 \\ 1e - 1 & . \\ 1e - 8 & . \\ 10 & 1 & . \\ 1e - 1 & . \\ 1e - 8 & . \\ 10 & 1 & . \\ 1e - 1 &$	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-3} \\ 1e^{$	$ \begin{array}{c} f14 \mbox{ in } 5\text{-} \mathbf{D}, \mbox{ N=15} \\ \# \ \mathrm{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \mathrm{cl} \ 1.6 \mathrm{cl} \ 4. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 11 \ 4.3 \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 12 \ \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 13 \ \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.2 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.3 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.3 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.3 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.3 \mathrm{cl} \ 3.3 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.4 \mathrm{cl} \ 3.3 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 3.4 \mathrm{cl} \ 3.3 \mathrm{cl} \ 3.3 \mathrm{cl} \ 3. \\ 15 \ \mathrm{cl} \ 4.2 \mathrm{cl} \ 4. \\ 10 \ 14 \mathrm{cl} \ 2.7 \mathrm{cl} \ 4. \\ 10 \ 14 \mathrm{cl} \ 2.3 \mathrm{cl} \ 3. \\ 10 \ 14 \mathrm{cl} \ 2.3 \mathrm{cl} \ 3. \\ 10 \ 16 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.8 \mathrm{cl} \ 1. \\ 10 \ 20 \mathrm{cl} \ 1.3 \mathrm{cl} \ 3.3 $	$\begin{array}{ccccccc} & & & & & & & & & & & & & & & &$	$\begin{array}{c} \mathbf{f}_{14} \ \mathbf{in} \ 2'\\ \# \ \mathbf{ERT}\\ 15 \ 4_{1} \ \mathbf{is} \ 3\\ 15 \ 1_{1} \ 6_{4}\\ 9 \ 4_{6} \ 6_{4}\\ 0 \ 15_{6-3}\\ \vdots\\ \\ \# \ \mathbf{ERT}\\ 0 \ 21_{6+0}\\ 0 \ 21_{6+0}\\ \vdots\\ \\ 15 \ 9_{4} \ 6_{3}\\ 8 \ 6_{7} \ 6_{4}\\ 0 \ 95_{6-2}\\ \vdots\\ \\ 15 \ 9_{4} \ 6_{3}\\ 8 \ 6_{7} \ 6_{4}\\ 0 \ 95_{6-2}\\ \vdots\\ \\ \vdots\\ \\ 15 \ 15 \ 9_{4} \ 6_{3}\\ 1_{7} \ 15 \ 9_{4} \ 6_{3}\\ 1_{7} \ 15 \ 9_{4} \ 6_{3}\\ 115 \ 13 \ 16_{6} \ 6_{4}\\ 15 \ 13 \ 16_{6} \ 6_{4}\\ 13 \ 1.7 \ 65_{5}\\ 13 \ 1.6 \ 64\\ 3 \ 1.7 \ 65_{5}\\ 0 \ 20_{6-1}\\ \vdots\\ \\ \vdots\\ \end{array}$	D-D, N=15, r 10% 90% 3.7c3 4.5c3 1.4c4 1.8c4 59e-4 27e-2 D-D, N=15, r 10% 90% 17e+0 24e+6 D-D, N=15, r 10% 90% 3.9c3 3.9c3 6.3c4 7.0e4 35e-2 16e-1 D-D, N=15, r 10% 90% 3.9c3 4.2c3 S0e-1 32e-1 D-D, N=15, r 10% 90% 1.2c4 2.0e4 1.5c5 1.9c5 69e-2 13e+6 	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$ \begin{array}{c} \mathbf{f_{13}\ in\ 20-D,\ N=15,\ mFE=40000} \\ \#\ ERT\ 10\%\ 90\%\ RT_{Succ} \\ \hline 1\ 5.9e5\ 5.8e5\ 6.0e5\ 4.0e4 \\ \hline 0\ 49e+0\ 15e+0\ 11e+1\ 3.5e4 \\ \hline \\ \dots\ $	$\begin{array}{c} 1 e - 8 \\ \hline 1 e - 8 \\ \hline \Delta f \\ 1 0 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 1 0 \\ 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline \Delta f \\ 1 0 \\ 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline \Delta f \\ 1 0 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 8 \\ \hline \Delta f \\ 1 0 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 8 \\ \hline \Delta f \\ 1 0 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline \Delta f \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline \Delta f \\ 1 \\ 1 e - 1 \\ 1 e - 8 \\ \hline 1 e - 8 \\ \hline 1 \\ 1 e - 1 \\ 1 e - 8 \\ \hline 1 e - 8$	$ \begin{array}{c} f14 \mbox{ in } \mathbf{5\text{-}D}, \ \mathbf{N=15} \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \ \mathbf{cl} \ 1.6 \ \mathbf{cl} \ 4. \\ 11 \ 4.3 \ \mathbf{cd} \ 2.5 \ \mathbf{cd} \ \mathbf{cl} \\ 11 \ 4.3 \ \mathbf{cd} \ 2.5 \ \mathbf{cd} \ \mathbf{cl} \\ 11 \ 1 \ 4.3 \ \mathbf{cd} \ 2.5 \ \mathbf{cd} \ \mathbf{cl} \\ 11 \ $	$\begin{array}{ccccccc} & & & & & & & & & & & & & & & &$	$ \begin{array}{c} \mathbf{f}_{14} \ \mathbf{in} \ 2' \\ \# \ \mathbf{ERT} \\ 15 \ 4_{1} \ \mathbf{in} \ 3 \\ 5 \ 15 \ 1_{1} \ 64 \\ 9 \ 4_{6} \ 64 \\ 0 \ 15 \ \mathbf{6-3} \\ . \\ . \\ 15 \ 1_{1} \ 64 \\ 9 \ 4_{6} \ 64 \\ 0 \ 15 \ \mathbf{6-3} \\ .$	$\begin{array}{c} \textbf{0-D}, \mathbf{N=15}, \mathbf{r} \\ \textbf{10\%} & 90\% \\ \textbf{3.7c3} & 4.5c3 \\ \textbf{1.4c4} & \textbf{1.8c4} \\ \textbf{59e-4} & 27e-2 \\ \textbf{.} \\ \textbf$	$\begin{array}{c} {}_{\rm n}{\rm FE}{=}40000\\ {\rm RT}_{\rm succ}\\ {\rm 4.1e3}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm 3.5e4}\\ {\rm}\\ {\rm n}{\rm FE}{=}40000\\ {\rm RT}_{\rm succ}\\ {\rm 2.0e4}\\ {\rm}\\ {\rm}\\ {\rm 1.6e4}\\ {\rm 2.9e4}\\ {\rm}\\ {\rm$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 1 e - 8 \\ \hline 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 1 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 1 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} 10\% 9 \\ 15 2.9 \text{ el} 1.6 \text{ el} 4. \\ 11 4.3 \text{ es} 2.5 \text{ es} 6. \\ 7 1.3 \text{ el} 1.0 \text{ el} 1. \\ 1 1.4 \text{ es} 2.5 \text{ es} 6. \\ 7 1.3 \text{ el} 1.0 \text{ el} 1. \\ 1 1.4 \text{ es} 1.4 \text{ es} 1.0 \text{ el} 1. \\ 1 1.4 \text{ es} 1.4 \text{ es} 1.0 \text{ el} 1.5 \\ \# \ \mathbf{ERT} 10\% 9 \\ 15 6.9 \text{ es} 4.9 \text{ es} 2.5 \text{ es} 6. \\ 0 35 \text{ es} 1 25 \text{ es} 1 25 \text{ es} 1 0. \\ \# \ \mathbf{ERT} 10\% 9 \\ 15 4.6 \text{ es} 3.7 \text{ es} 5. \\ 14 3.6 \text{ es} 3.0 \text{ es} 3.7 \text{ es} 5. \\ 14 3.6 \text{ es} 3.0 \text{ es} 3.7 \text{ es} 5. \\ 14 3.6 \text{ es} 3.0 \text{ es} 4.2 \text{ ed} 4. \\ 0 14 \text{ e} 2.7 \text{ es} 4.6 \\ . \qquad . \qquad . \\ . \qquad . \\ . \qquad . \\ f20 \mathbf{in} \ 5 \text{-} \mathbf{D}, \mathbf{N} = 15 \\ \# \ \mathbf{ERT} 10\% 9 \\ 15 1.3 \text{ es} 8 \text{ el} 1. \\ 0 20 \text{ es} 1 16 \text{ es} 1 \\ 2 . \qquad . \\ .$	$\begin{array}{ccccc} & & & & & & & & & & & & & & & & &$	f14 in 2' # ERT 15 4.1e3 15 1.6e4 9 4.6e4 0 15e-3 .	$\begin{array}{c} 0\text{-D}, \mathbf{N}=15, \mathbf{r}, \\ 0\% & 90\% \\ 3.7 \text{-c3} & 4.5 \text{-c3} \\ 1.4 \text{c4} & 1.8 \text{c4} \\ 59e-4 & 27e-2 \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . & . \\ . \\$	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 1 e - 8 \\ \hline 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 e - 1 \\ 1 e - 3 \\ 1 e - 5 \\ 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 \\ 1 e - 1 \\ 1 e - 8 \\ \hline 0 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{cl} \ 1.6 \text{cl} \ 4. \\ 11 \ 4.3 \text{cl} \ 2.5 \text{cl} \ 6. \\ 7 \ 1.3 \text{cl} \ 1.0 \text{cl} \ 1. \\ 1 \ 1.4 \text{cl} \ 5.2 \text{cl} \ 1.6 \text{cl} \ 4. \\ 11 \ 4.3 \text{cl} \ 2.5 \text{cl} \ 6. \\ 7 \ 1.3 \text{cl} \ 1.0 \text{cl} \ 1. \\ 1 \ 1.4 \text{cl} \ 5.1 \text{cl} \ 5.1 \\ 10 \ 12e - 2 \ 13e - 4 \ 20 \\ 10 \ 35e - 1 \ 25e - 1 \ 65 \\ . \ . \ . \ . \$		$\begin{array}{c} \mathbf{f}_{14} \ \mathbf{in} \ 2'\\ \# \ \mathbf{ERT}\\ 15 \ 4_{1} \ \mathbf{6a} \\ 9 \ 4_{6} \ 64\\ 0 \ \mathbf{15e}_{-3}\\ \cdot\\ \cdot\\ \mathbf{f}_{16} \ \mathbf{in} \ 2\\ \# \ \mathbf{ERT}\\ 0 \ \mathbf{21e}_{+0}\\ \cdot\\ \cdot\\ 15 \ 9_{4} \ \mathbf{6a} \\ 8 \ \mathbf{6.7e4}\\ 0 \ \mathbf{95e}_{-2}\\ \cdot\\ \cdot\\ \cdot\\ 15 \ 9_{4} \ \mathbf{6a} \\ 8 \ \mathbf{6.7e4}\\ 0 \ \mathbf{95e}_{-2}\\ \cdot\\ \cdot\\ \cdot\\ 15 \ 9_{4} \ \mathbf{6a} \\ 8 \ \mathbf{6.7e4}\\ 0 \ \mathbf{95e}_{-2}\\ \cdot\\ \cdot\\ \cdot\\ 15 \ \mathbf{4.0e3}\\ 0 \ \mathbf{31e}_{-1}\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{20e}_{-1}\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{20e}_{-1}\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{20e}_{-1}\\ \cdot\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{20e}_{-1}\\ \cdot\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{20e}_{-1}\\ \cdot\\ \cdot\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{20e}_{-1}\\ \cdot\\ \cdot\\ \cdot\\ \cdot\\ \cdot\\ 13 \ \mathbf{1.7e5}\\ 0 \ \mathbf{11e}_{-1} \ \mathbf{11e}_{-1}\\ \cdot\\ \cdot\\$	$\begin{array}{c} 0\text{-D}, \mathbf{N}=15, \mathbf{r}, \\ 0\% & 90\% \\ 3.7e3 & 4.5e3 \\ 1.4e4 & 1.8e4 \\ 5ge-4 & 27e-2 \\ . & . \\ . & \\ . & . \\$	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{cl} \ 1.6 \text{cl} \ 4. \\ 11 \ 4.3 \text{cl} \ 2.5 \text{cd} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 4.3 \text{cd} \ 2.5 \text{cd} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 4.3 \text{cd} \ 2.5 \text{cd} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \$		$\begin{array}{c} \mathbf{f14 \ in 2}\\ \mathbf{\# \ ERT}\\ 15 \ \mathbf{4.1e3}\\ 16 \ 15 \ \mathbf{4.1e3}\\ 15 \ \mathbf{9.4e3}\\ 8 \ \mathbf{6.7e4}\\ 0 \ \mathbf{95e-2}\\ .\\ $	$\begin{array}{c} 0\text{-D}, \mathbf{N}=15, \mathbf{r}, \\ \mathbf{10\%} & 90\% \\ 3.7e3 & 4.5e3 \\ 1.4e4 & 1.8e4 \\ 5ge-4 & 27e-2 \\ . & . \\ . & $	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \Delta f \\ 10 \\ 1 \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-5} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ 1e^{-8} \\ \Delta f \\ 10 \\ 1 \\ 1e^{-1} \\ 1e^{-3} \\ 1e^{-8} \\ 1e^{-8} \\ \Delta f \\ 1e^{-8} \\ 1e^{-8} \\ 1e^{-8} \\ \Delta f \\ 1e^{-8} \\$	$ \begin{array}{c} f14 \text{ in } 5\text{-}\mathbf{D}, \ \mathbf{N} = 15 \\ \# \ \mathbf{ERT} \ 10\% \ 9 \\ 15 \ 2.9 \text{cl} \ 1.6 \text{cl} \ 4. \\ 11 \ 4.3 \text{cl} \ 2.5 \text{cd} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 4.3 \text{cd} \ 2.5 \text{cd} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 4.3 \text{cd} \ 2.5 \text{cd} \ 6. \\ 7 \ 1.3 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ 1 \ 4.5 \text{cd} \ 1.0 \text{cd} \ 1. \\ 11 \ \mathbf$		$\begin{array}{c} \mathbf{f_{14}\ in 2}\\ \mathbf{\#\ ERT}\\ 15\ \mathbf{4.1e3}\\ 71\\ $	$\begin{array}{c} 0\text{-D}, \mathbf{N}=15, \mathbf{r}, \\ \mathbf{10\%} & 90\% \\ 3.7e3 & 4.5e3 \\ 1.4e4 & 1.8e4 \\ 5ge-4 & 27e-2 \\ . & . \\ . & $	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$

Table 2: Shown are, 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 (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) or Δf . 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, 10D, 100D... function evaluations (from right to left cycling black-cyan-magenta). Top row: all results from all functions; second row: separable functions; third row: misc. moderate functions; fourth row: ill-conditioned functions; fifth row: multi-modal functions with weak structure. 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.