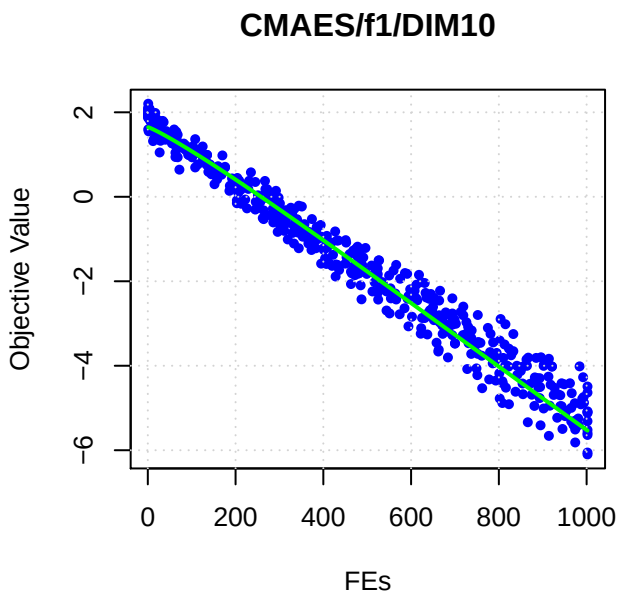
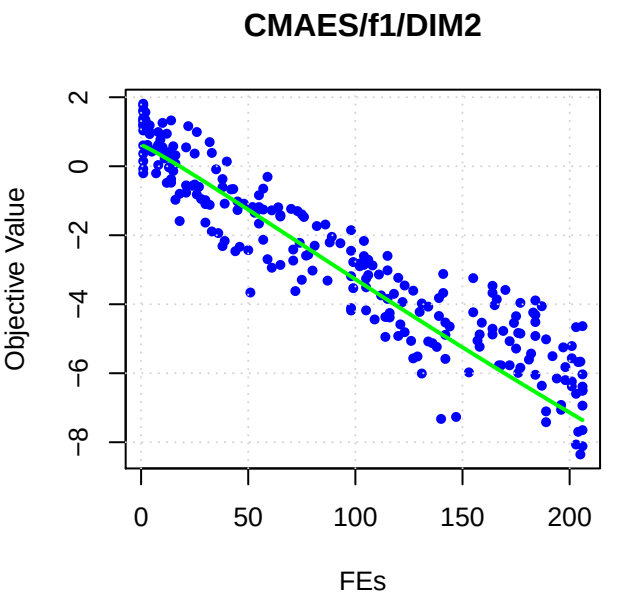

CMAES/f1/DIM10
Objective Value
FEs
2
0
−2
−4
−6
0
200
400
600
800
1000


CMAES/f1/DIM2
Objective Value
FEs
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0
−2
−4
−6
−8
0
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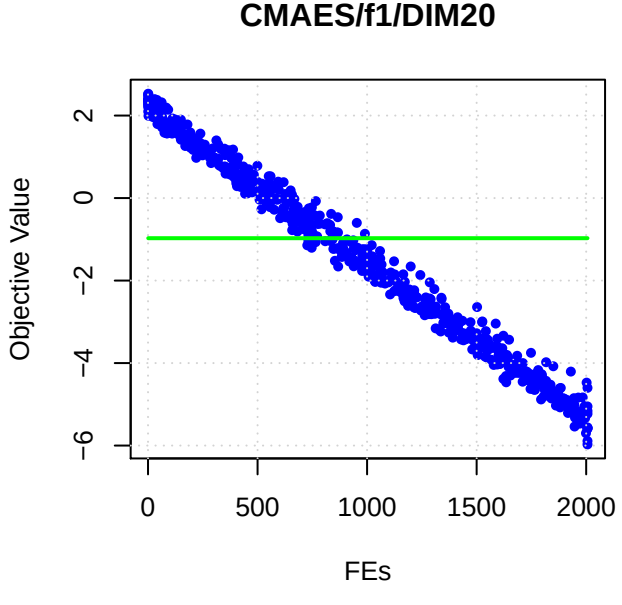
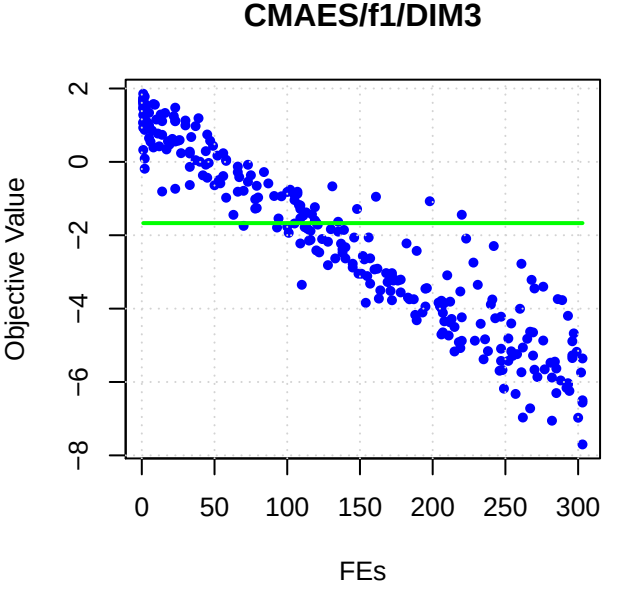
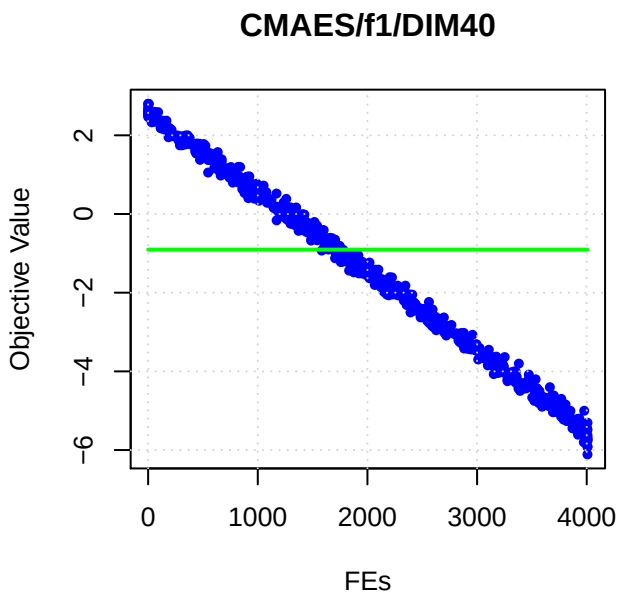
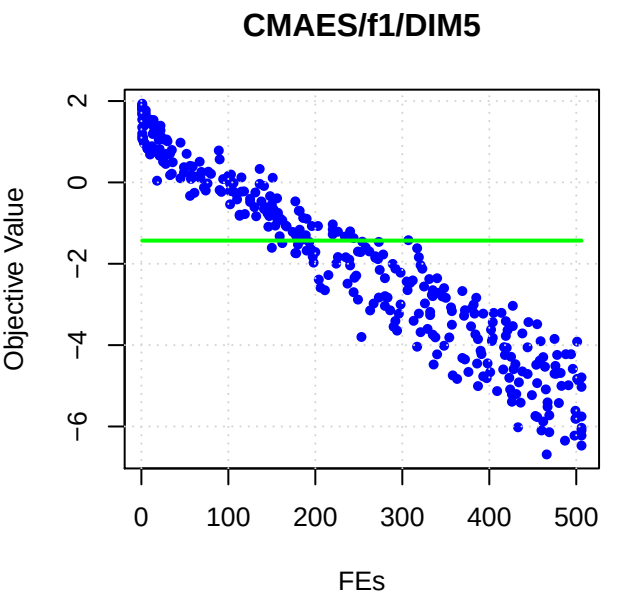
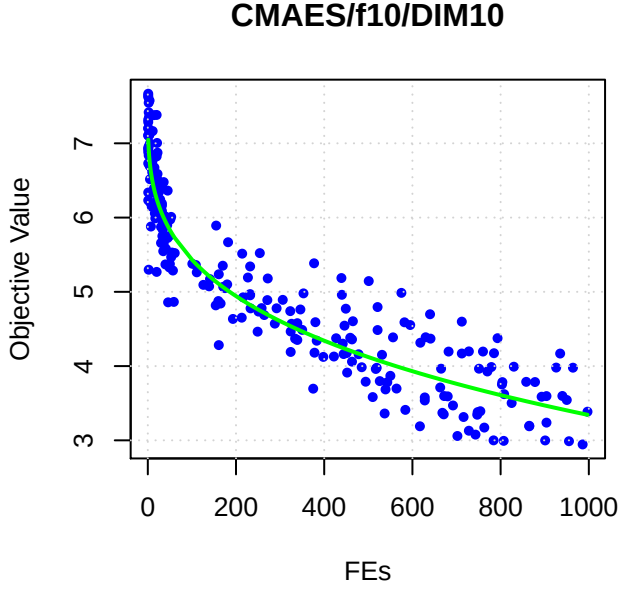
100
150
200

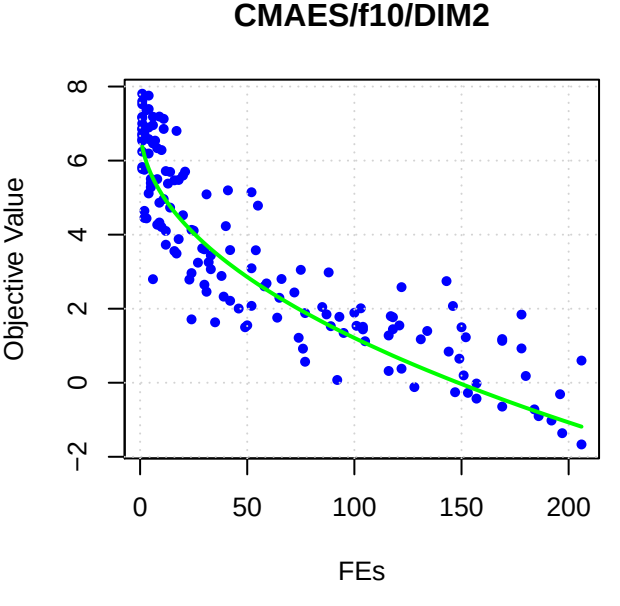

CMAES/f1/DIM20
Objective Value
FEs
2
0
−2
−4
−6
0
500
1000
1500
2000

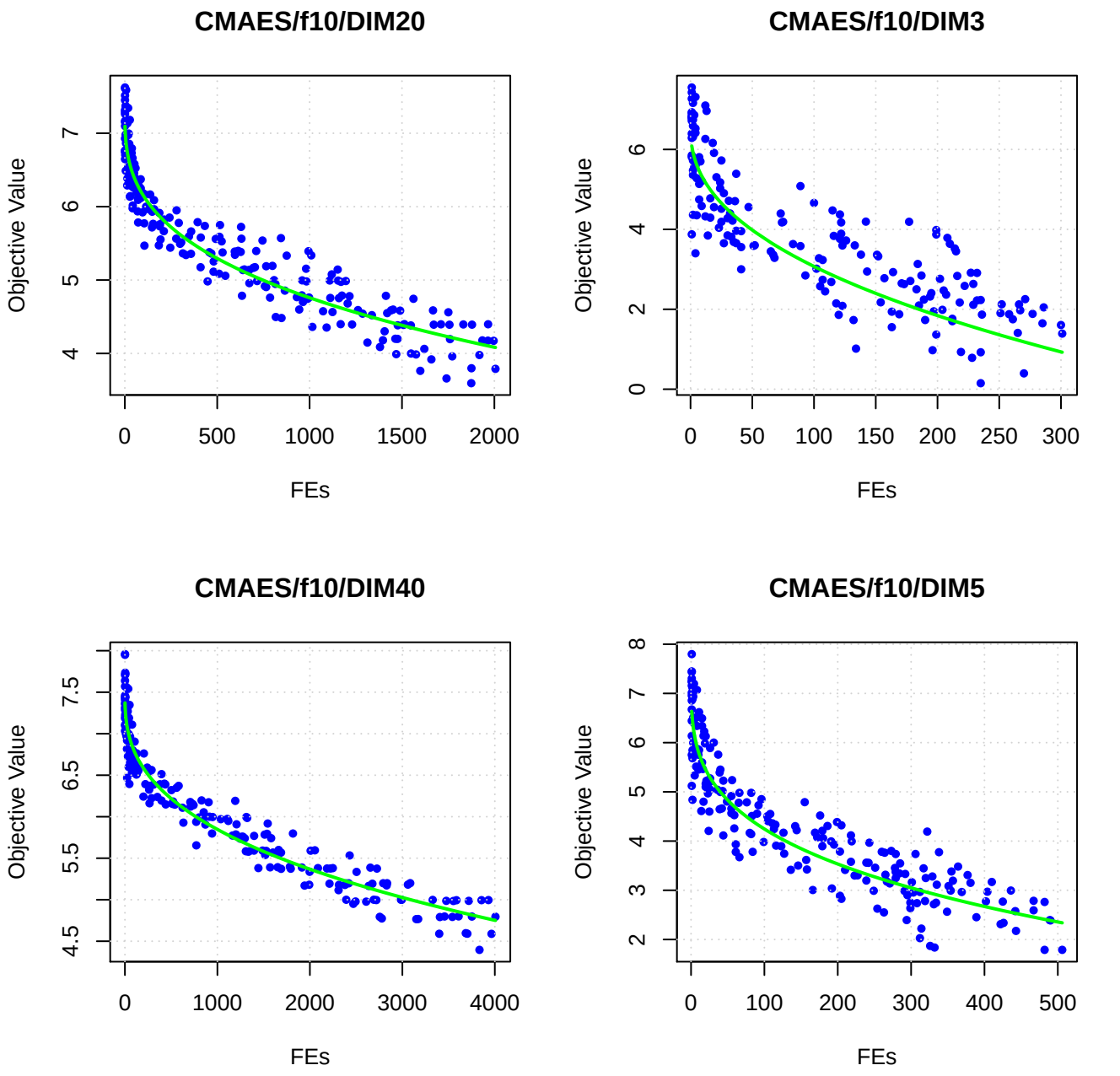

CMAES/f1/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
150
200
250
300

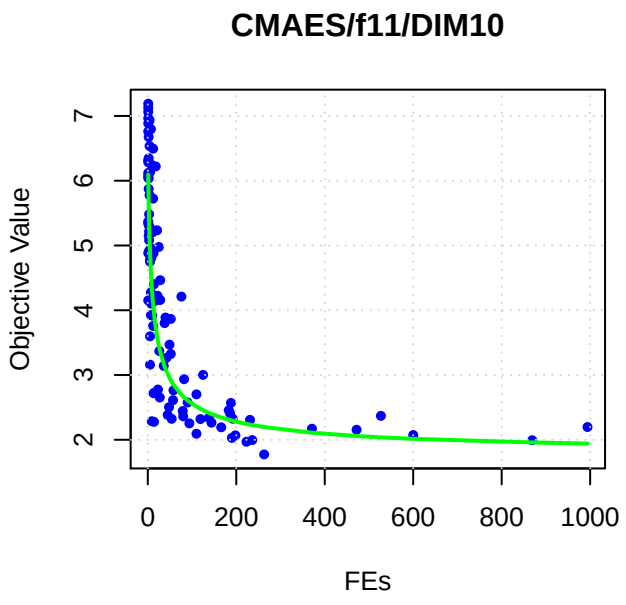

CMAES/f1/DIM40
Objective Value
FEs
2
0
−2
−4
−6
0
1000
2000
3000
4000


CMAES/f1/DIM5
Objective Value
FEs
2
0
−2
−4
−6
0
100
200
300
400
500


CMAES/f10/DIM10
Objective Value
FEs
7
6
5
4
3
0
200
400
600
800
1000


CMAES/f10/DIM2
Objective Value
FEs
8
6
4
2
0
−2
0
50
100
150
200


CMAES/f10/DIM20
Objective Value
FEs
CMAES/f10/DIM3
Objective Value
FEs
CMAES/f10/DIM40
Objective Value
FEs
CMAES/f10/DIM5
Objective Value
FEs


CMAES/f11/DIM10
Objective Value
FEs
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3
4
5
6
7
0
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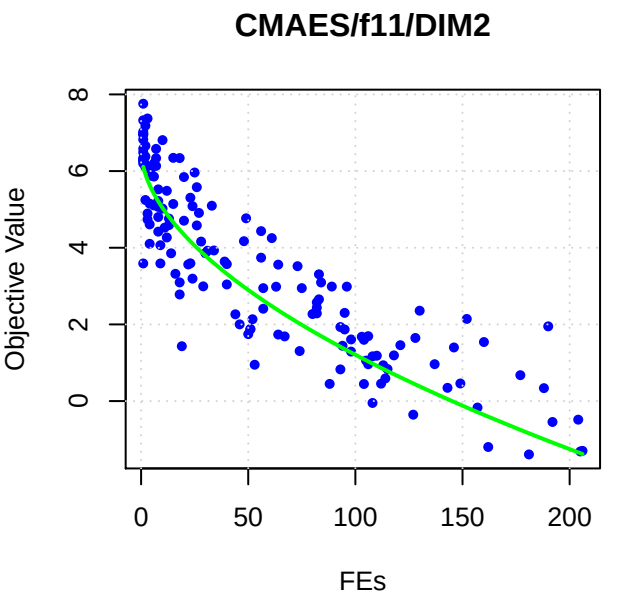
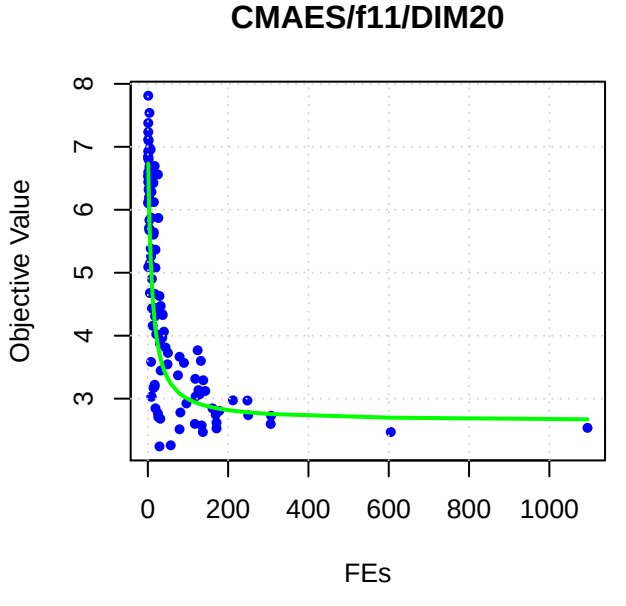
400
600
800
1000


CMAES/f11/DIM2
Objective Value
FEs
0
2
4
6
8
0
50
100
150
200


CMAES/f11/DIM20
Objective Value
FEs
3
4
5
6
7
8
0
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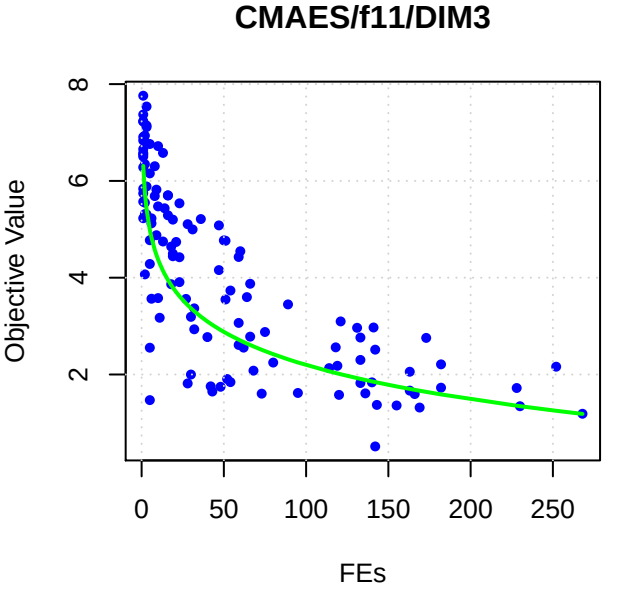
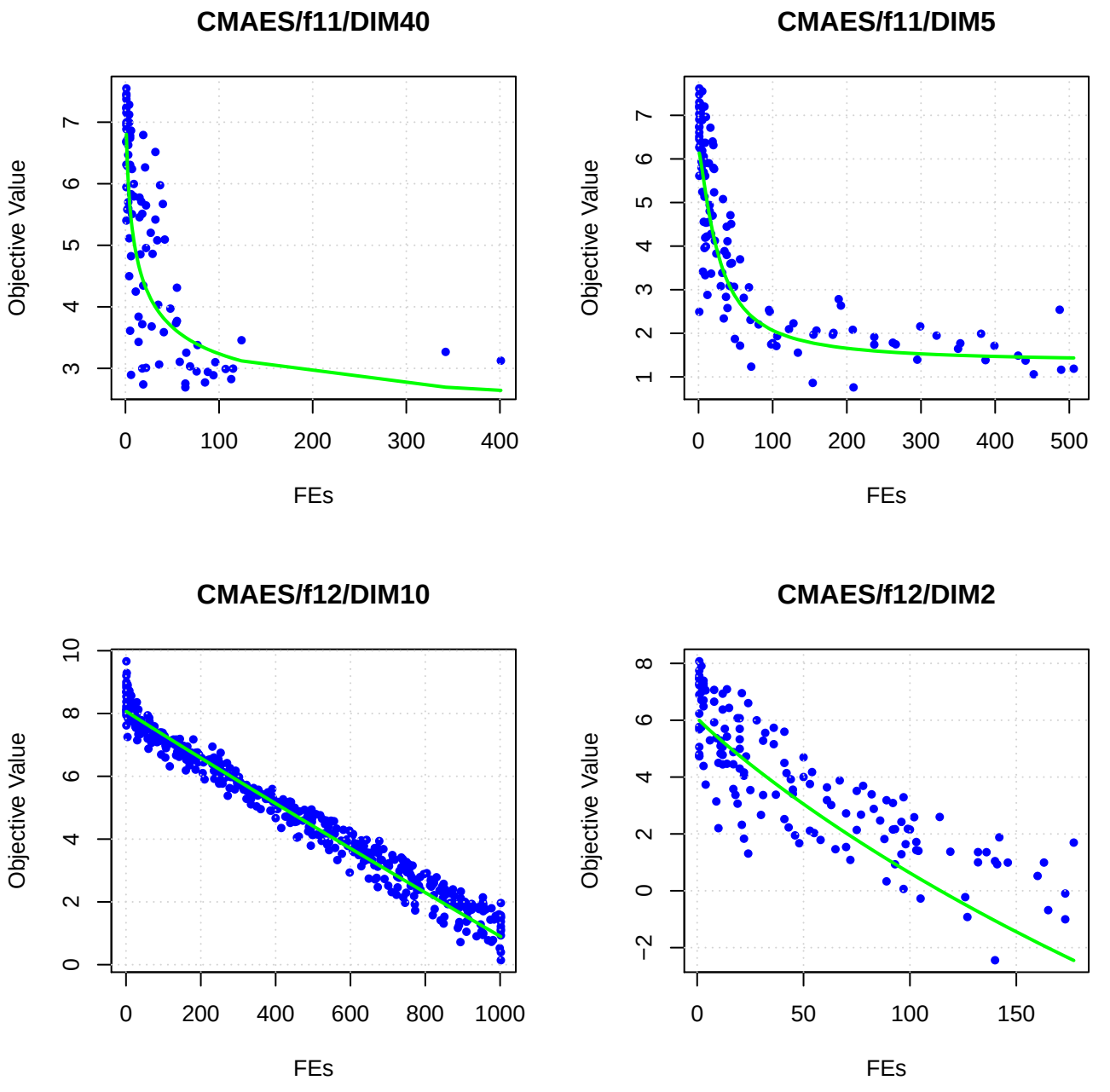
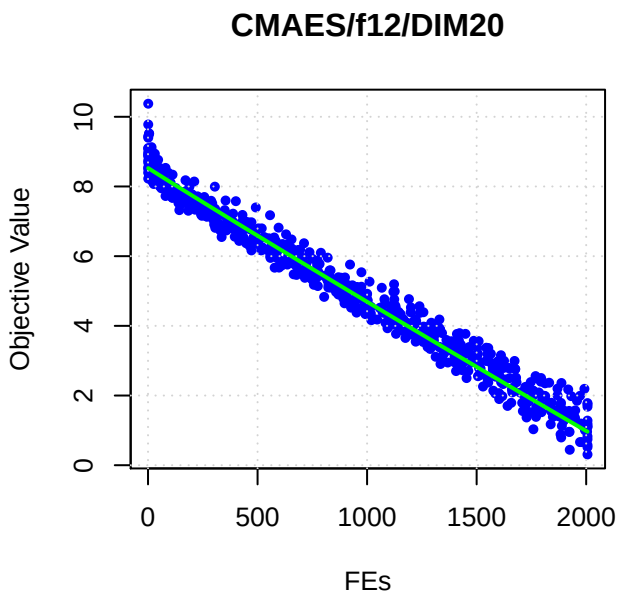
400
600
800
1000


CMAES/f11/DIM3
Objective Value
FEs
2
4
6
8
0
50
100
150
200
250


CMAES/f11/DIM40
Objective Value
FEs
CMAES/f11/DIM5
Objective Value
FEs
CMAES/f12/DIM10
Objective Value
FEs
CMAES/f12/DIM2
Objective Value
FEs


CMAES/f12/DIM20
Objective Value
FEs
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2
4
6
8
10
0
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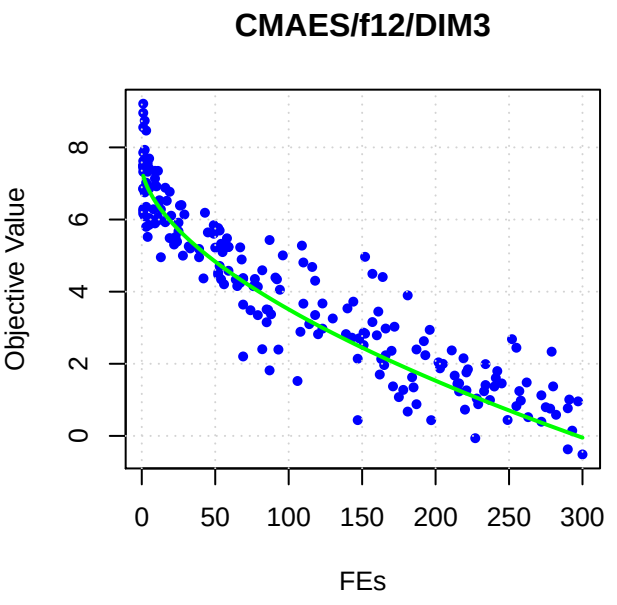
1000
1500
2000


CMAES/f12/DIM3
Objective Value
FEs
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4
6
8
0
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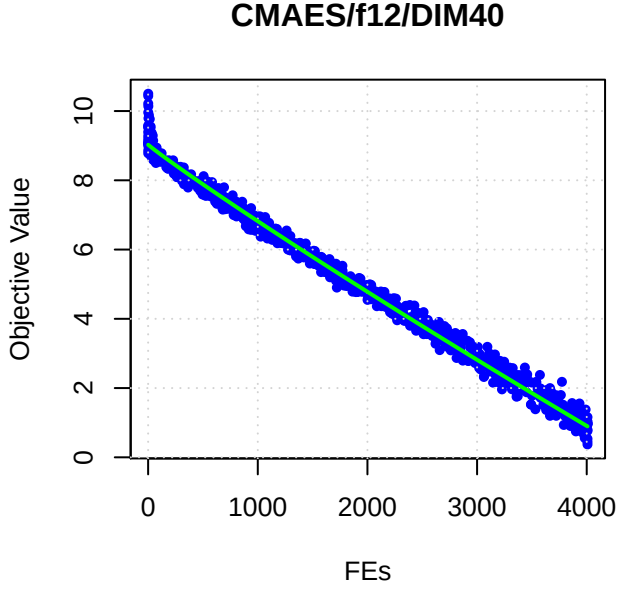
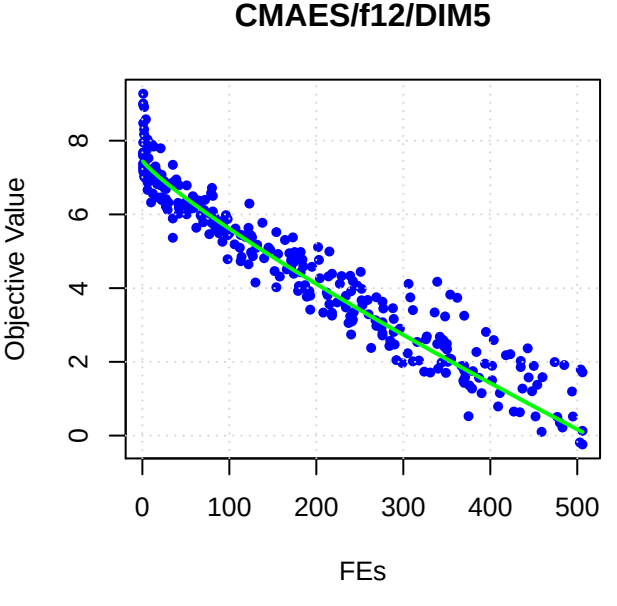
150
200
250
300


CMAES/f12/DIM40
Objective Value
FEs
0
2
4
6
8
10
0
1000
2000
3000
4000


CMAES/f12/DIM5
Objective Value
FEs
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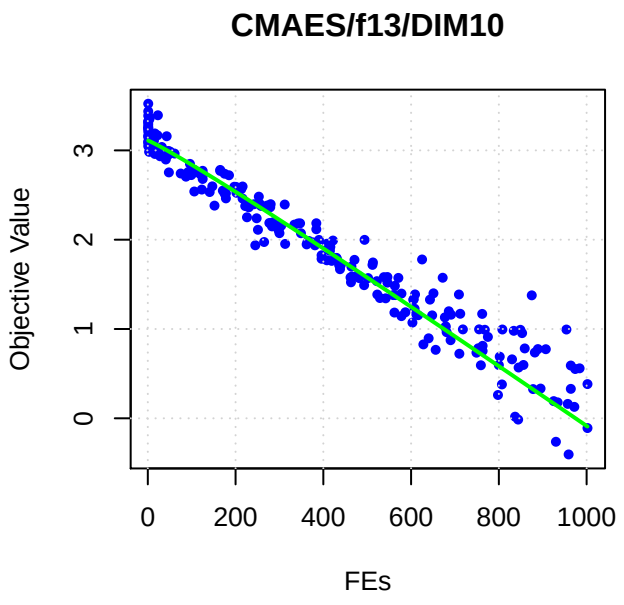
2
4
6
8
0
100
200
300
400
500


CMAES/f13/DIM10
Objective Value
FEs
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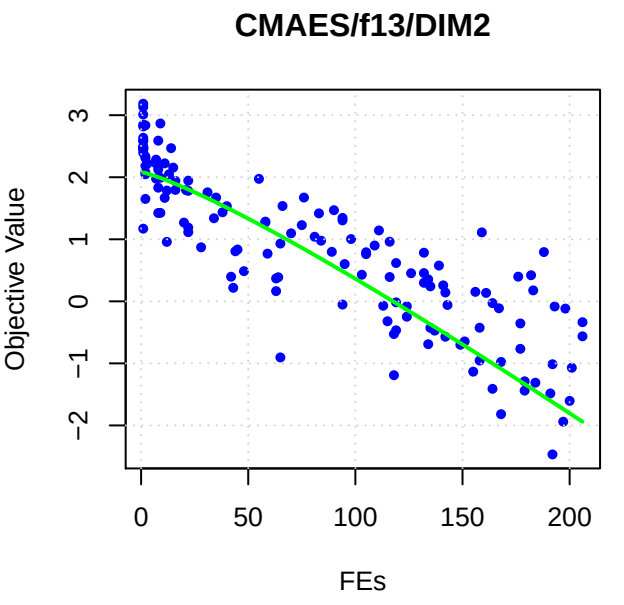
1
2
3
0
200
400
600
800
1000


CMAES/f13/DIM2
Objective Value
FEs
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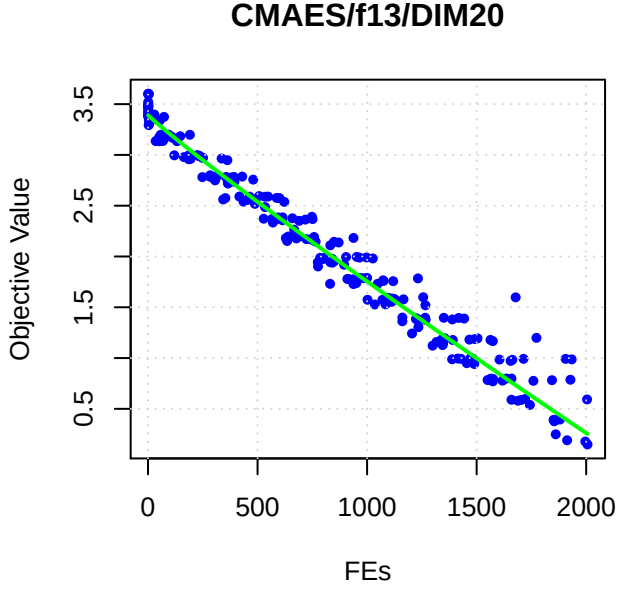
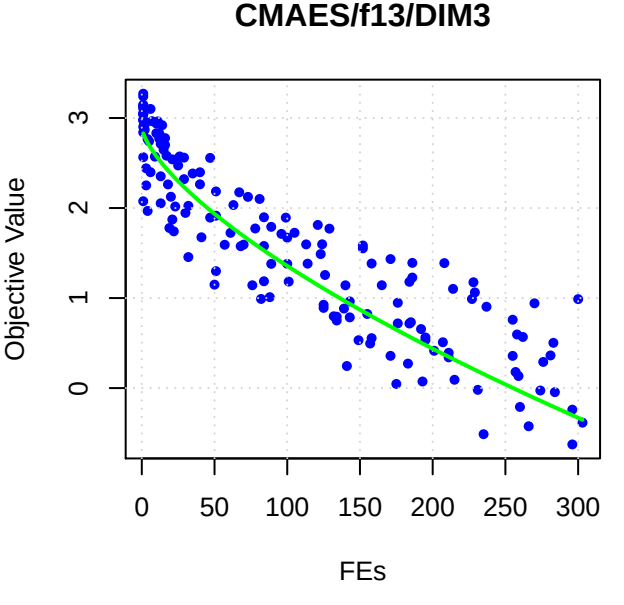
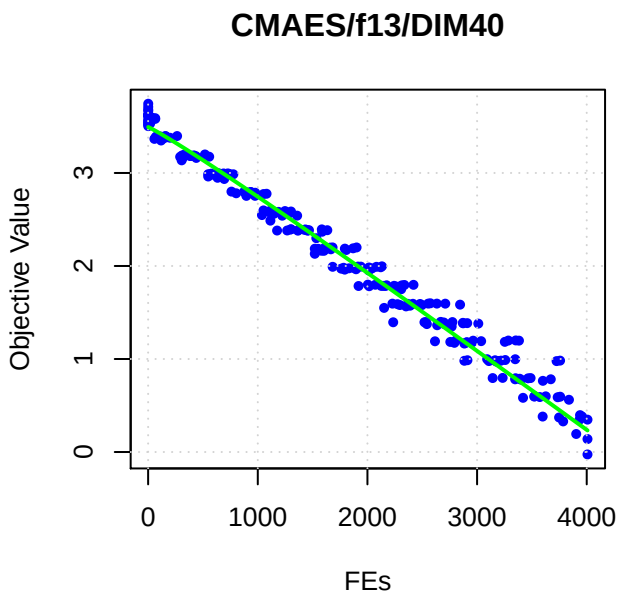
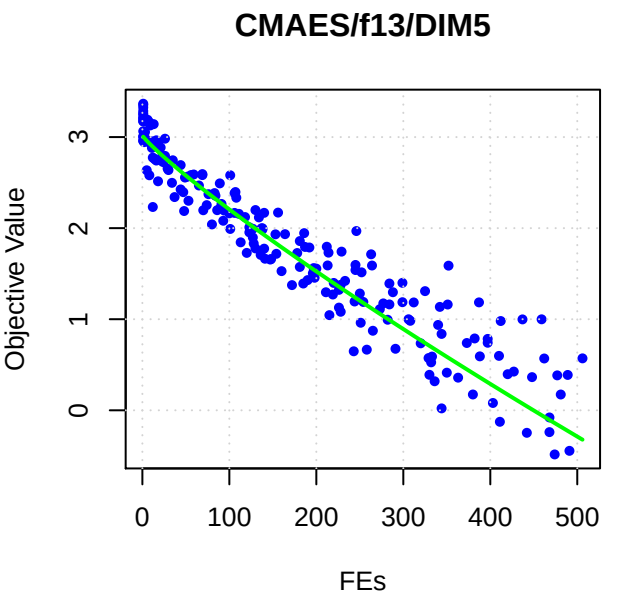
−1
0
1
2
3
0
50
100
150
200


CMAES/f13/DIM20
Objective Value
FEs
0.5
1.5
2.5
3.5
0
500
1000
1500
2000


CMAES/f13/DIM3
Objective Value
FEs
0
1
2
3
0
50
100
150
200
250
300


CMAES/f13/DIM40
Objective Value
FEs
0
1
2
3
0
1000
2000
3000
4000


CMAES/f13/DIM5
Objective Value
FEs
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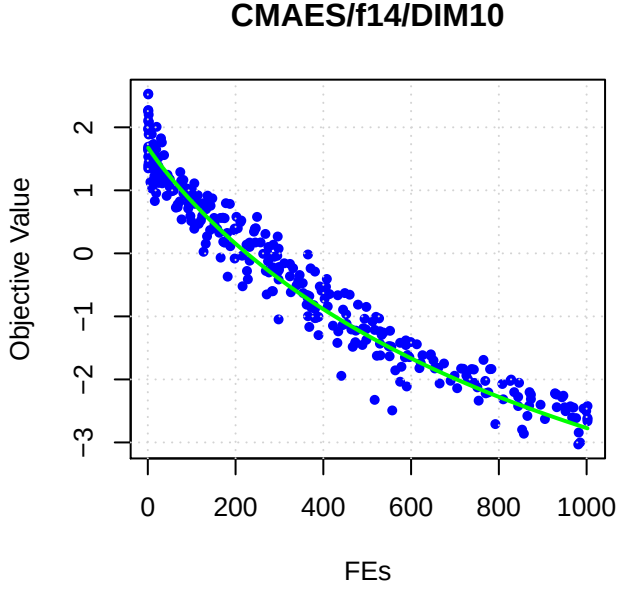
1
2
3
0
100
200
300
400
500


CMAES/f14/DIM10
Objective Value
FEs
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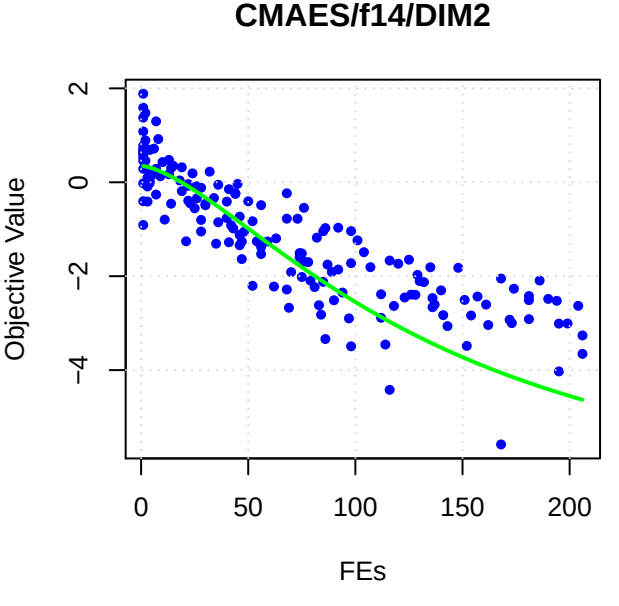
−2
−1
0
1
2
0
200
400
600
800
1000


CMAES/f14/DIM2
Objective Value
FEs
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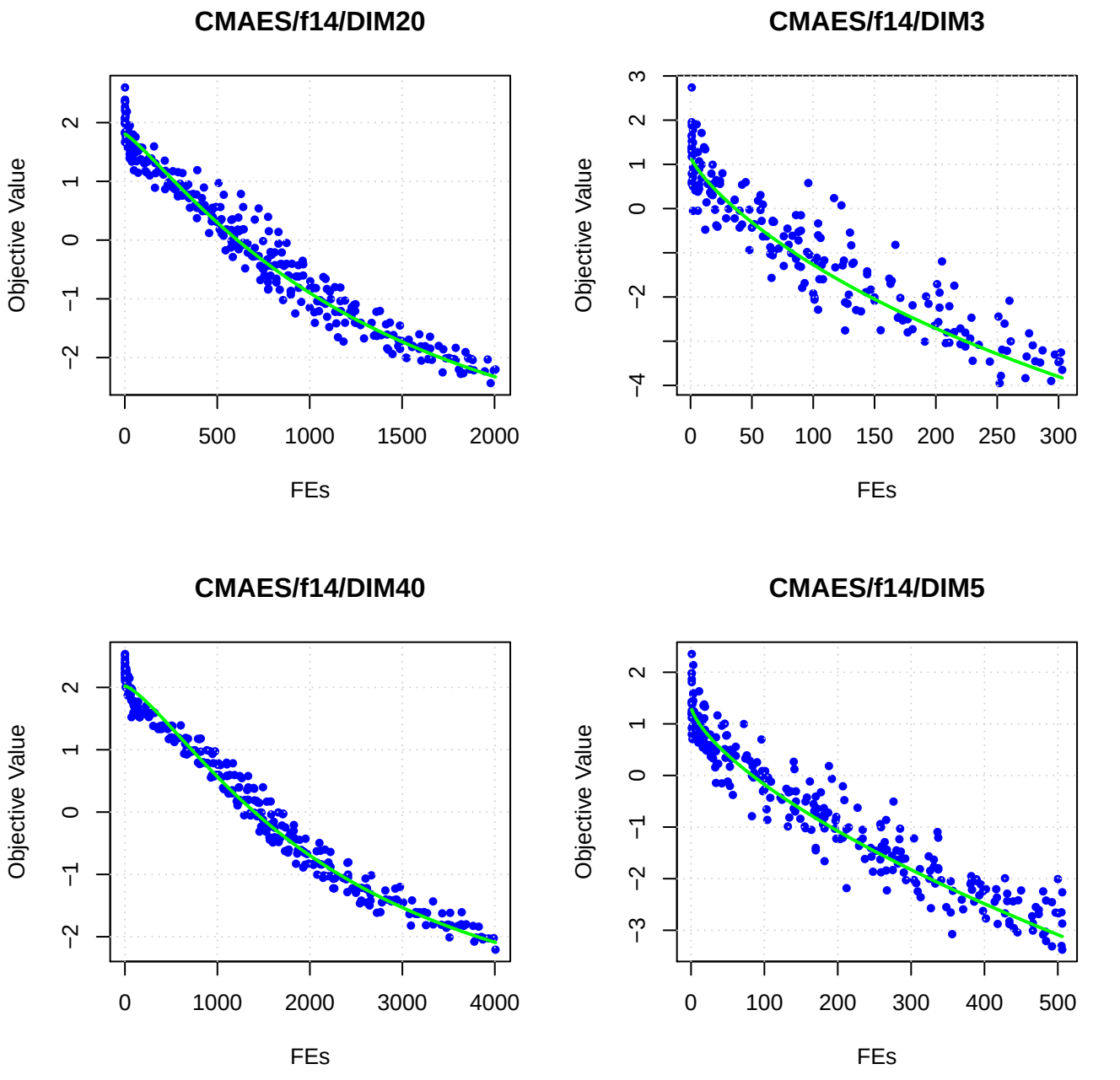
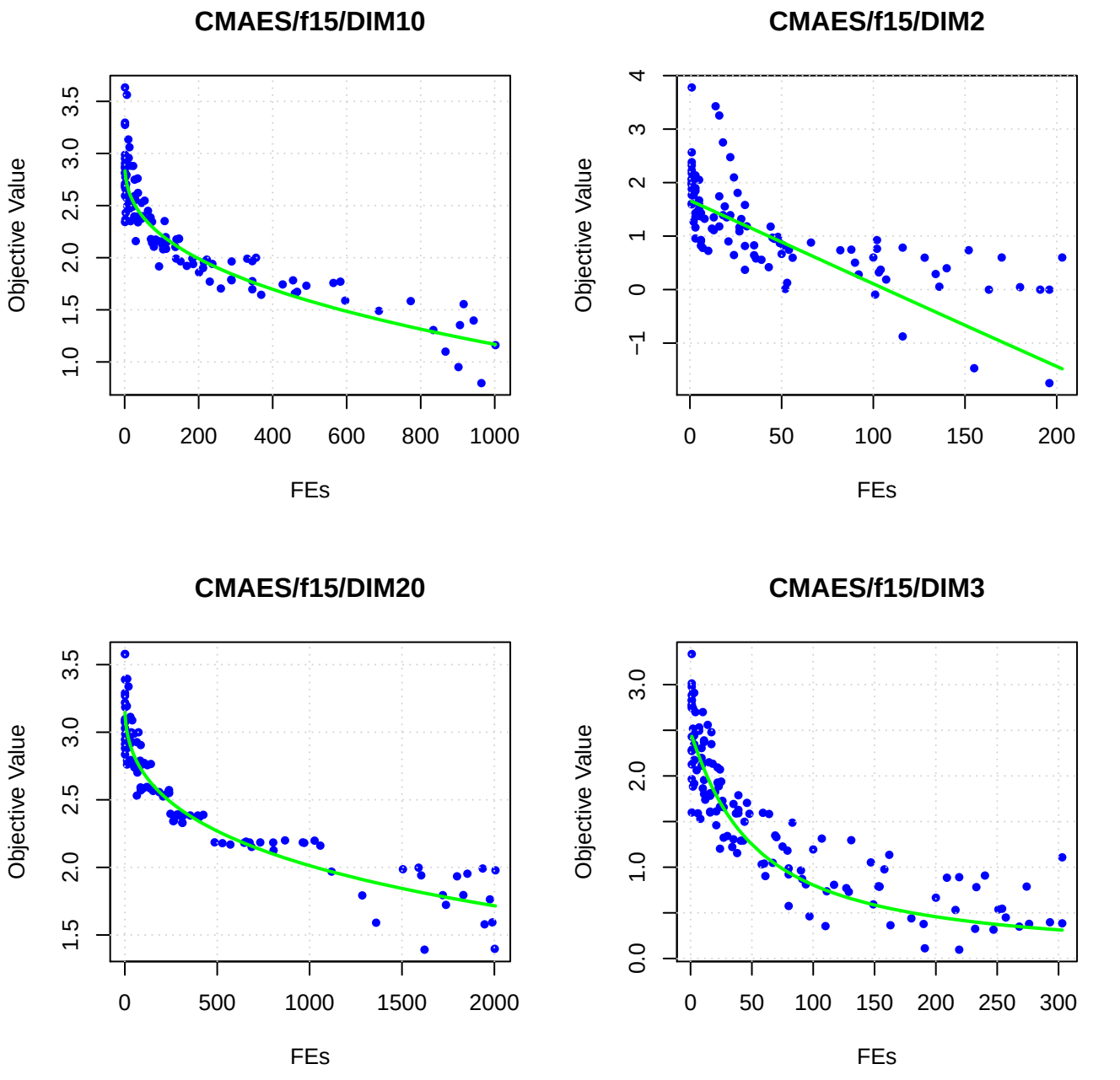
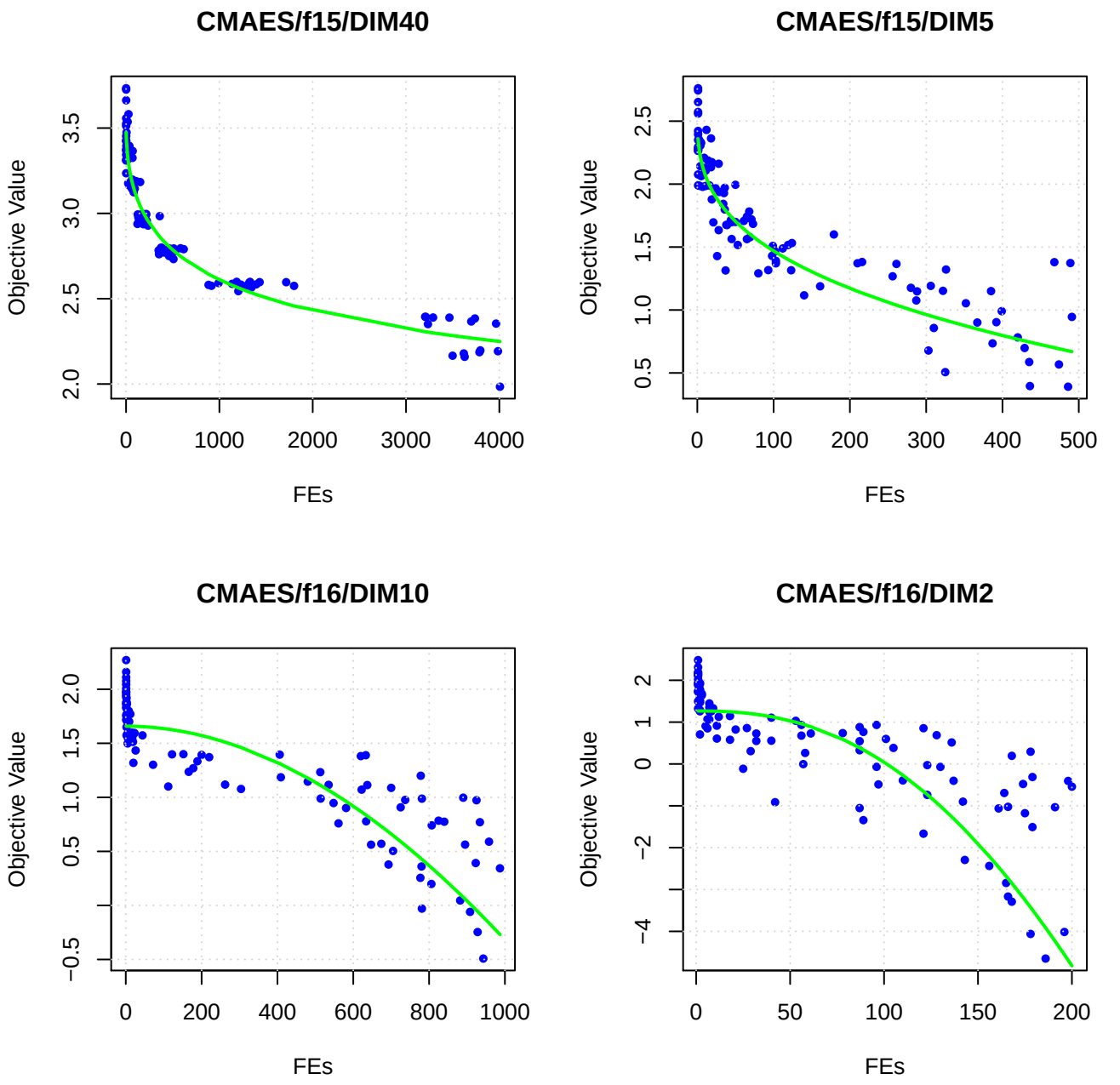
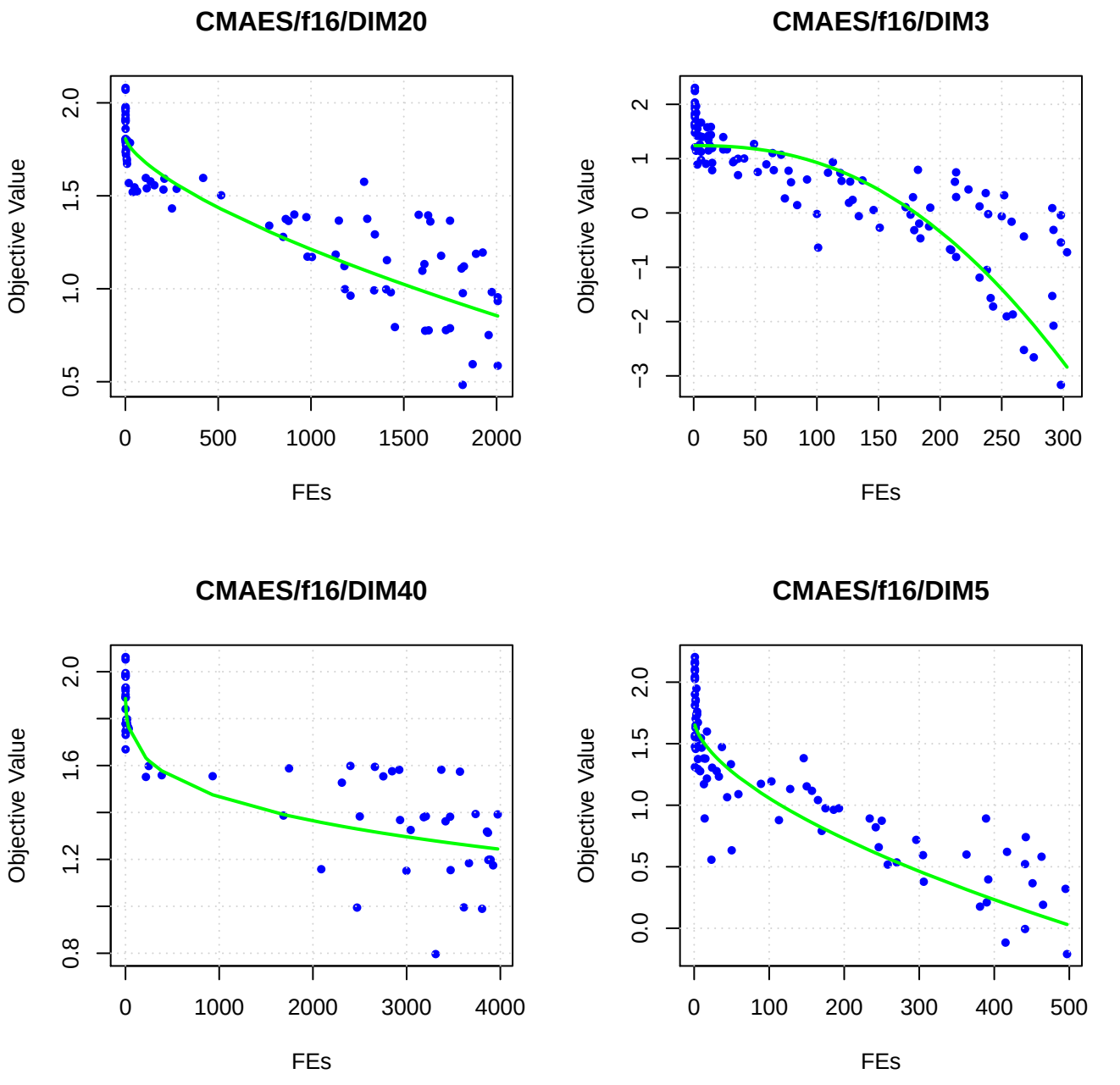
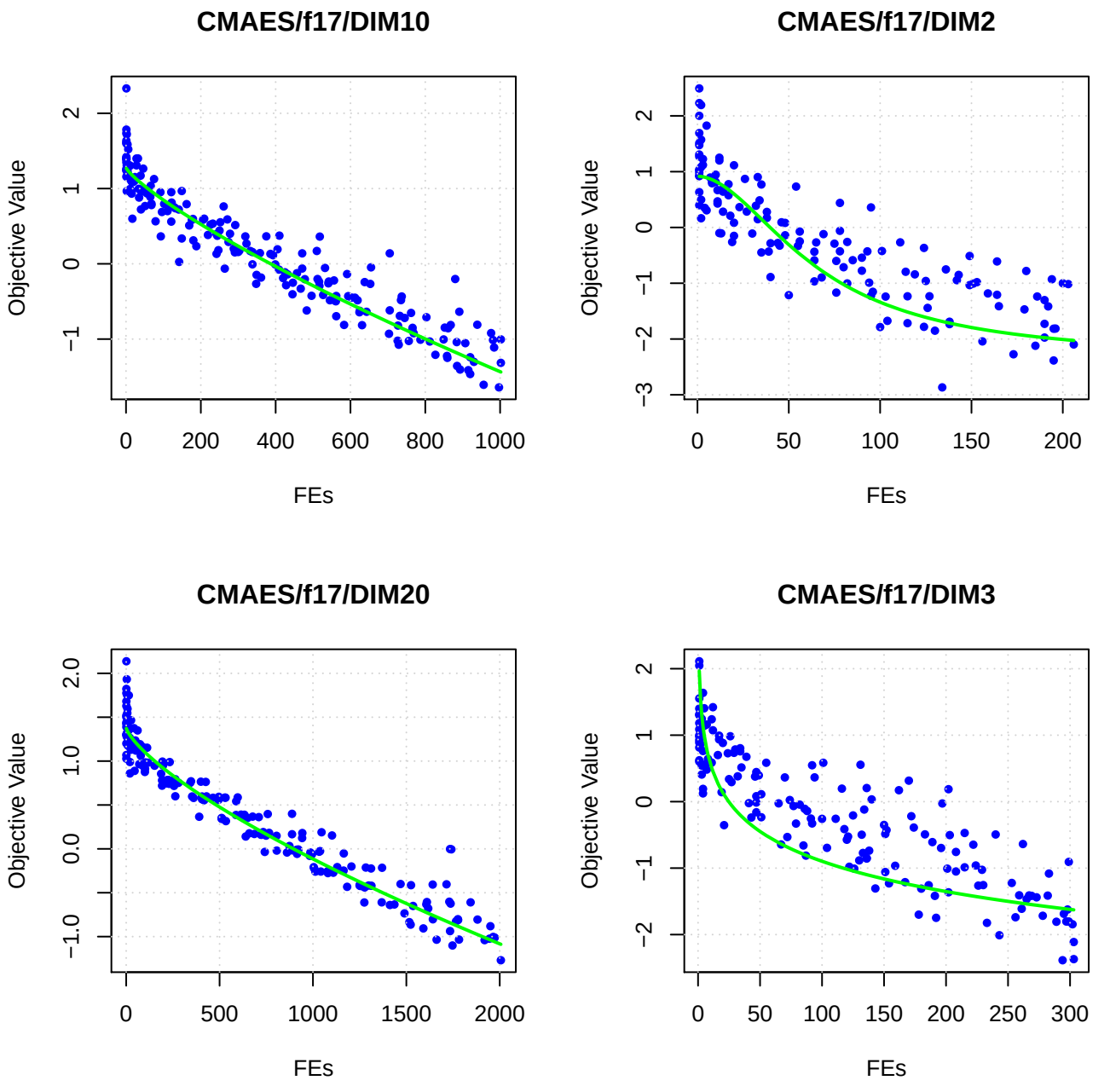
−2
0
2
0
50
100
150
200

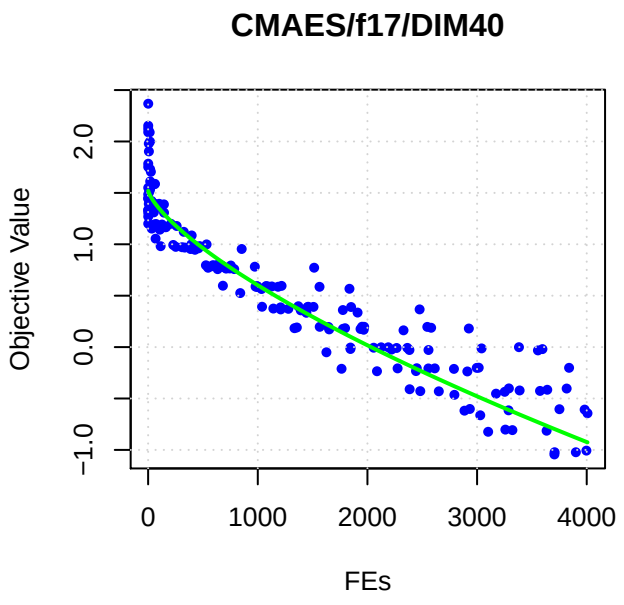

CMAES/f14/DIM20
Objective Value
FEs
CMAES/f14/DIM3
Objective Value
FEs
CMAES/f14/DIM40
Objective Value
FEs
CMAES/f14/DIM5
Objective Value
FEs

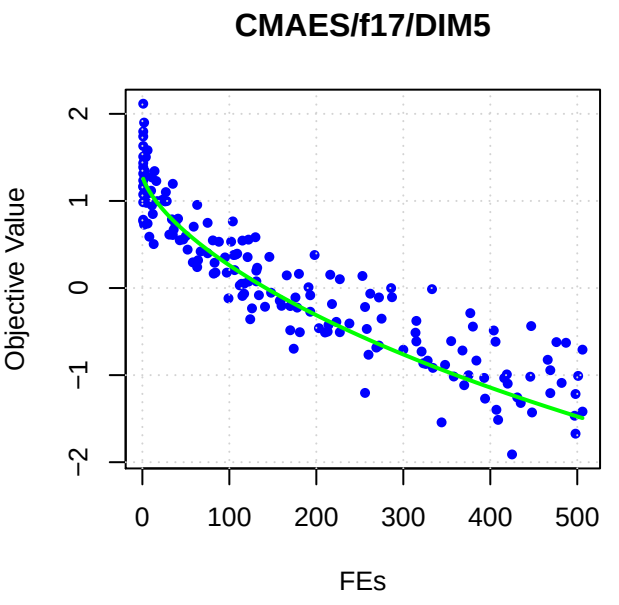

CMAES/f15/DIM10
Objective Value
FEs
CMAES/f15/DIM2
Objective Value
FEs
CMAES/f15/DIM20
Objective Value
FEs
CMAES/f15/DIM3
Objective Value
FEs

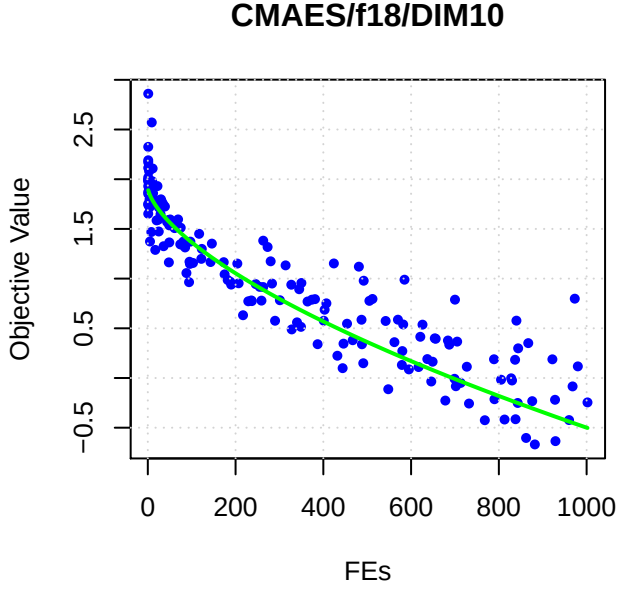

CMAES/f15/DIM40
Objective Value
FEs
CMAES/f15/DIM5
Objective Value
FEs
CMAES/f16/DIM10
Objective Value
FEs
CMAES/f16/DIM2
Objective Value
FEs

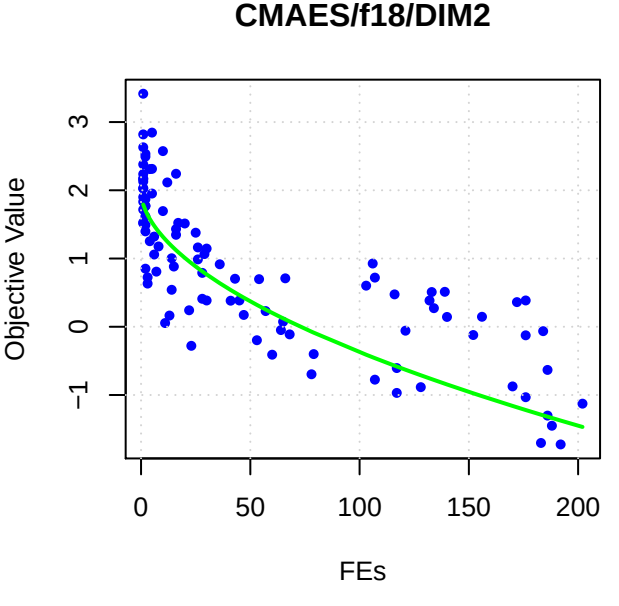

CMAES/f16/DIM20
Objective Value
FEs
0.5
1.0
1.5
2.0
0
500
1000
1500
2000
CMAES/f16/DIM3
Objective Value
FEs
−3
−2
−1
0
1
2
0
50
100
150
200
250
300
CMAES/f16/DIM40
Objective Value
FEs
0.8
1.2
1.6
2.0
0
1000
2000
3000
4000
CMAES/f16/DIM5
Objective Value
FEs
0.0
0.5
1.0
1.5
2.0
0
100
200
300
400
500

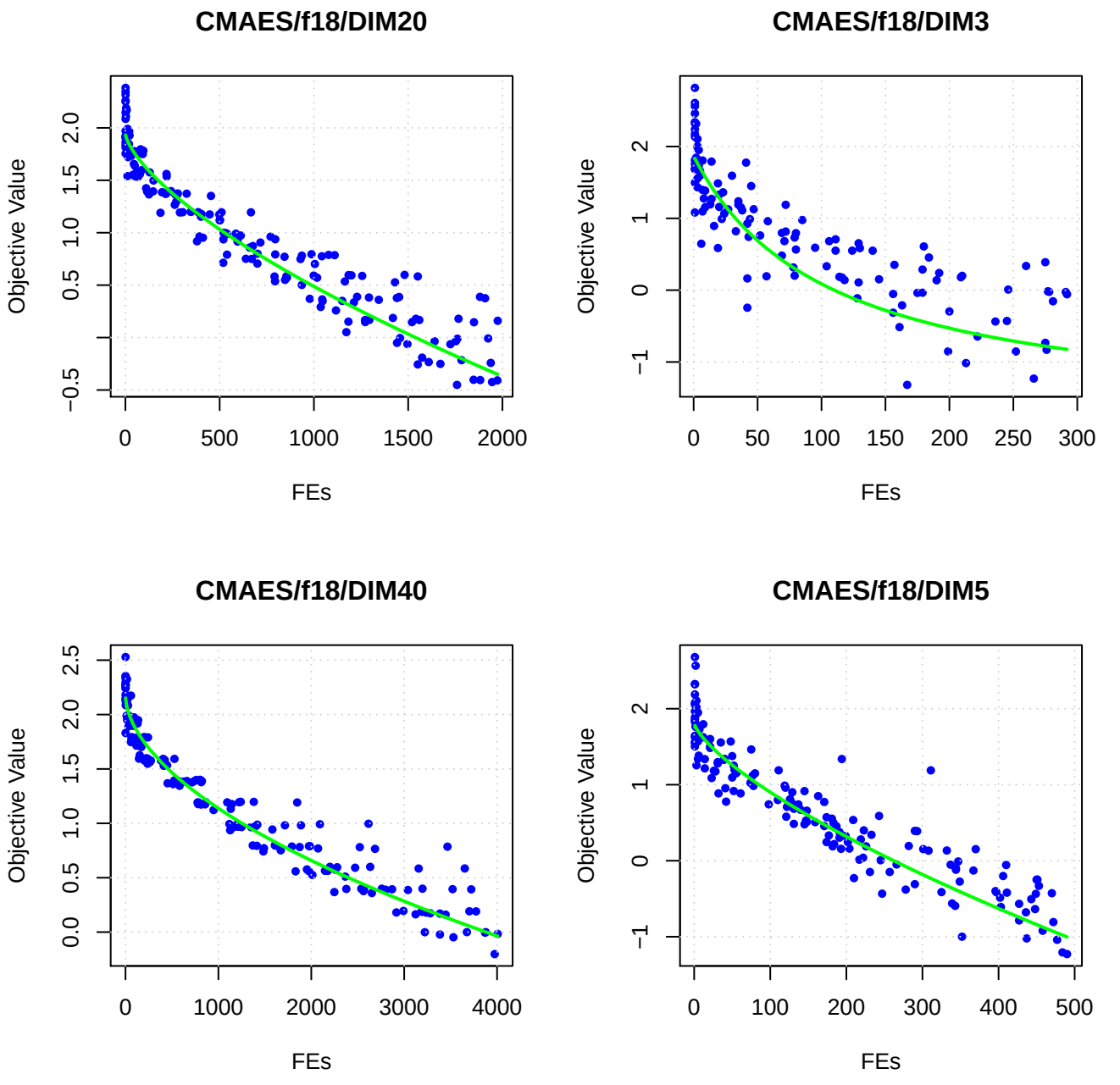

CMAES/f17/DIM10
Objective Value
FEs
CMAES/f17/DIM2
Objective Value
FEs
CMAES/f17/DIM20
Objective Value
FEs
CMAES/f17/DIM3
Objective Value
FEs

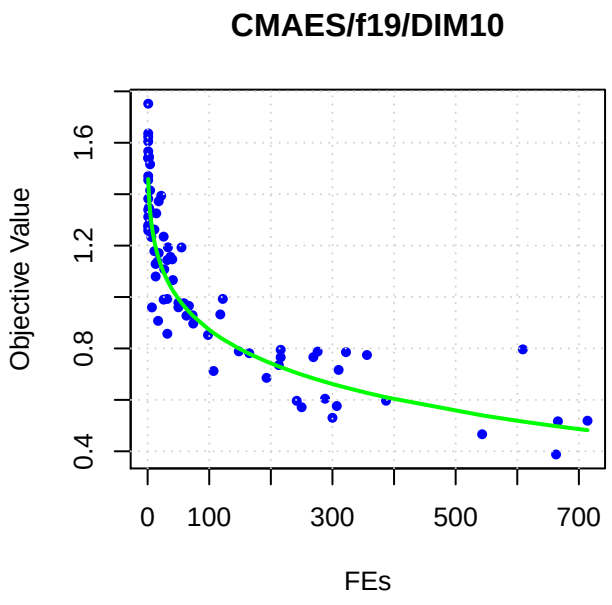

CMAES/f17/DIM40
Objective Value
FEs
2.0
1.0
0.0
−1.0
0
1000
2000
3000
4000


CMAES/f17/DIM5
Objective Value
FEs
2
1
0
−1
−2
0
100
200
300
400
500


CMAES/f18/DIM10
Objective Value
FEs
2.5
1.5
0.5
−0.5
0
200
400
600
800
1000


CMAES/f18/DIM2
Objective Value
FEs
3
2
1
0
−1
0
50
100
150
200


CMAES/f18/DIM20
Objective Value
FEs
CMAES/f18/DIM3
Objective Value
FEs
CMAES/f18/DIM40
Objective Value
FEs
CMAES/f18/DIM5
Objective Value
FEs


CMAES/f19/DIM10
Objective Value
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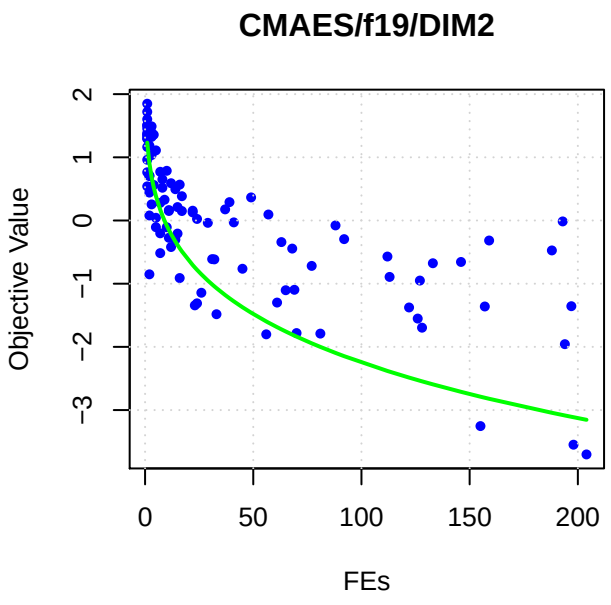
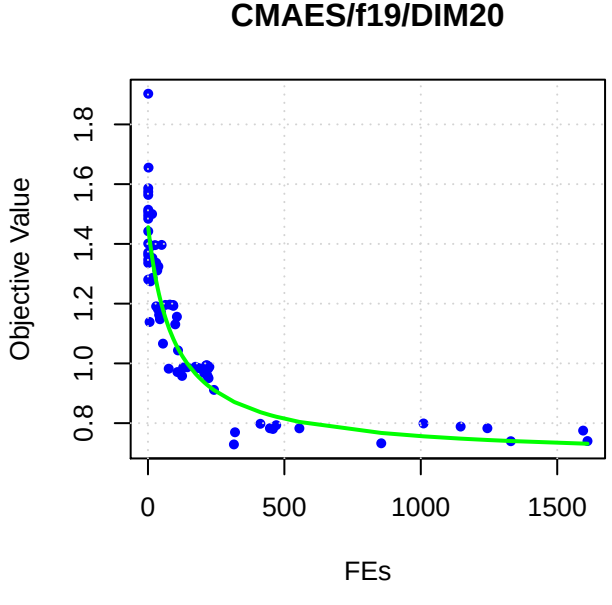
0.8
1.2
1.6
0
100
300
500
700
FEs


CMAES/f19/DIM2
Objective Value
−3
−2
−1
0
1
2
0
50
100
150
200
FEs


CMAES/f19/DIM20
Objective Value
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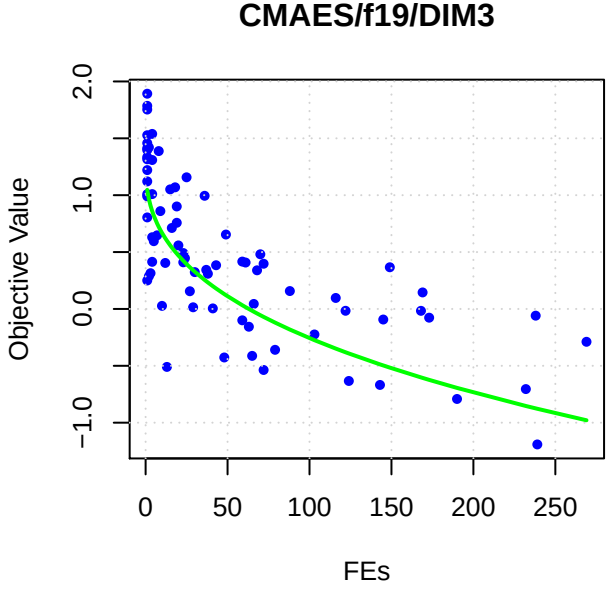
1.0
1.2
1.4
1.6
1.8
0
500
1000
1500
FEs


CMAES/f19/DIM3
Objective Value
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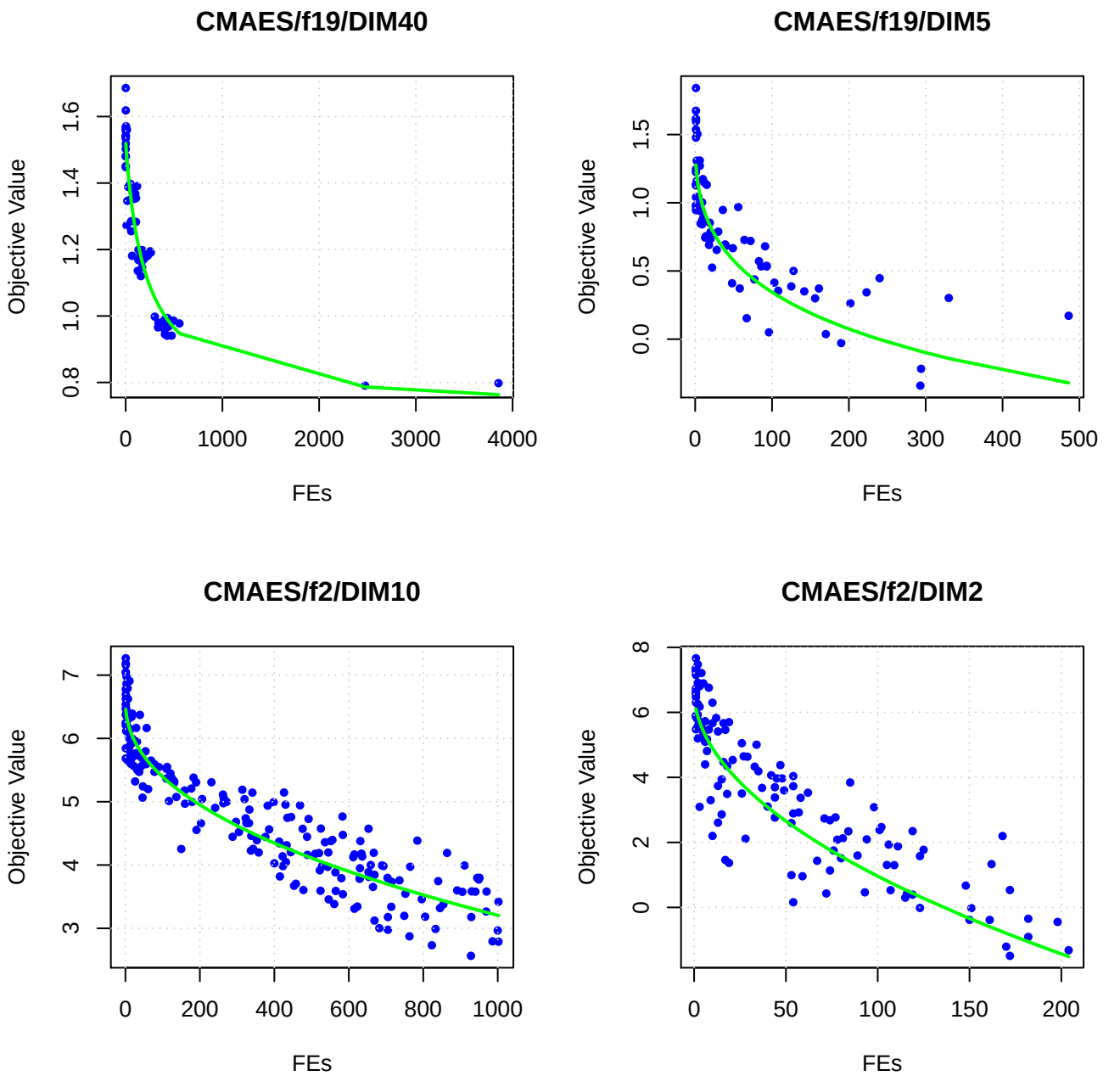
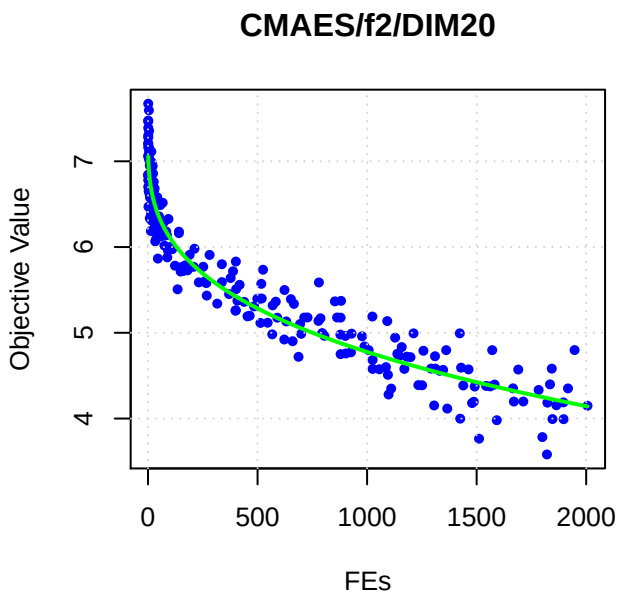
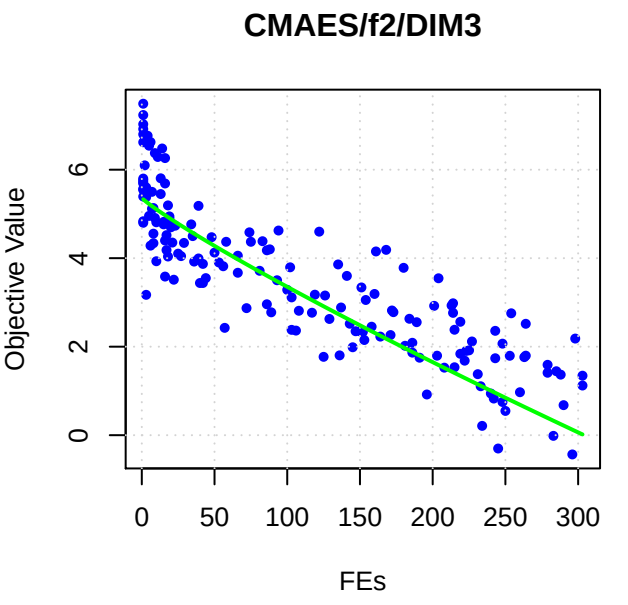
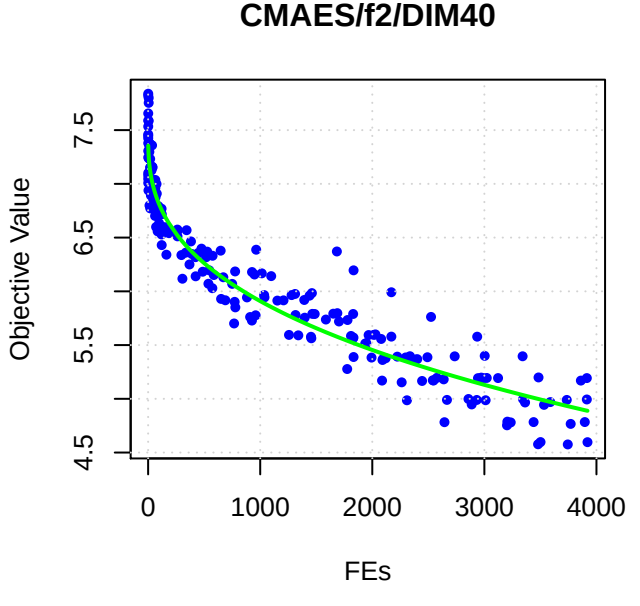
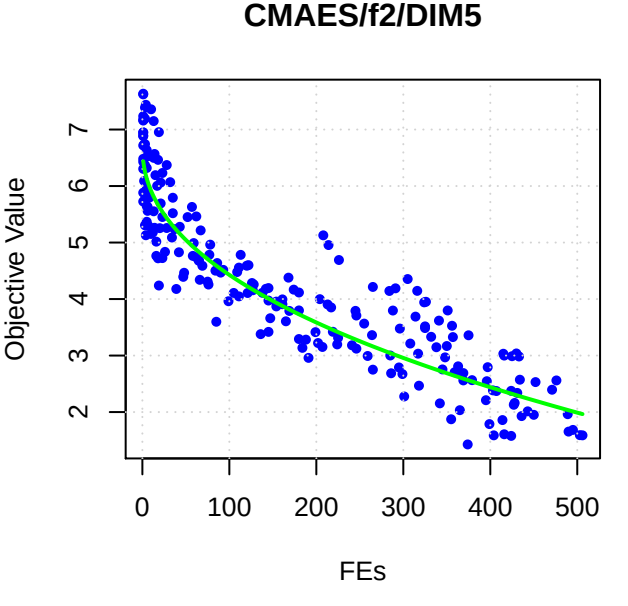
0.0
1.0
2.0
0
50
100
150
200
250
FEs

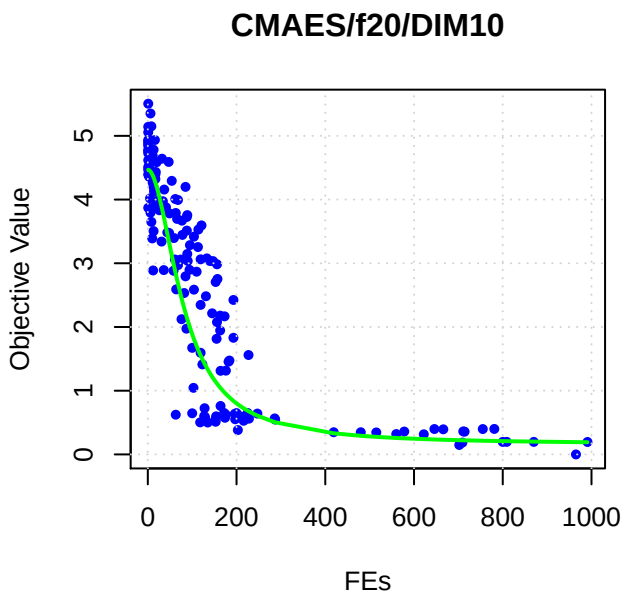

CMAES/f19/DIM40
Objective Value
0.8
1.0
1.2
1.4
1.6
0
1000
2000
3000
4000
FEs
CMAES/f19/DIM5
Objective Value
0.0
0.5
1.0
1.5
0
100
200
300
400
500
FEs
CMAES/f2/DIM10
Objective Value
3
4
5
6
7
0
200
400
600
800
1000
FEs
CMAES/f2/DIM2
Objective Value
0
2
4
6
8
0
50
100
150
200
FEs

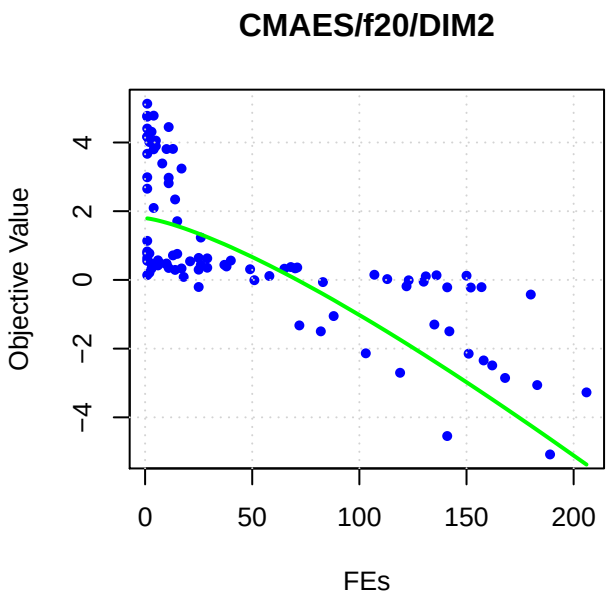

CMAES/f2/DIM20
Objective Value
FEs
0
500
1000
1500
2000
4
5
6
7

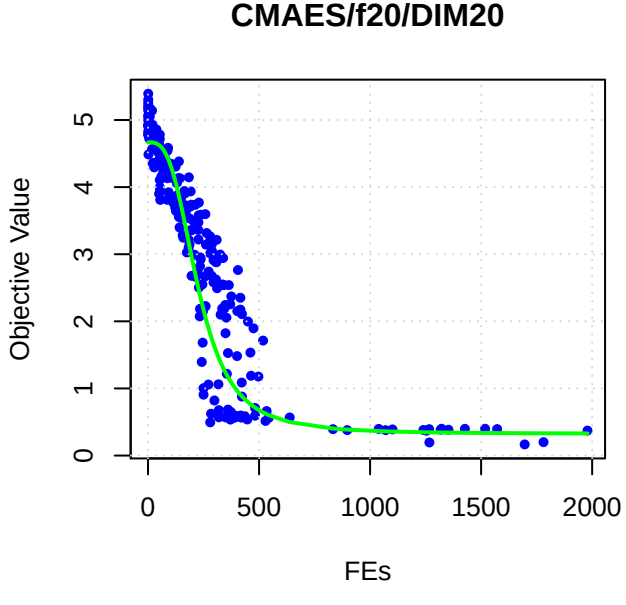

CMAES/f2/DIM3
Objective Value
FEs
0
50
100
150
200
250
300
0
2
4
6

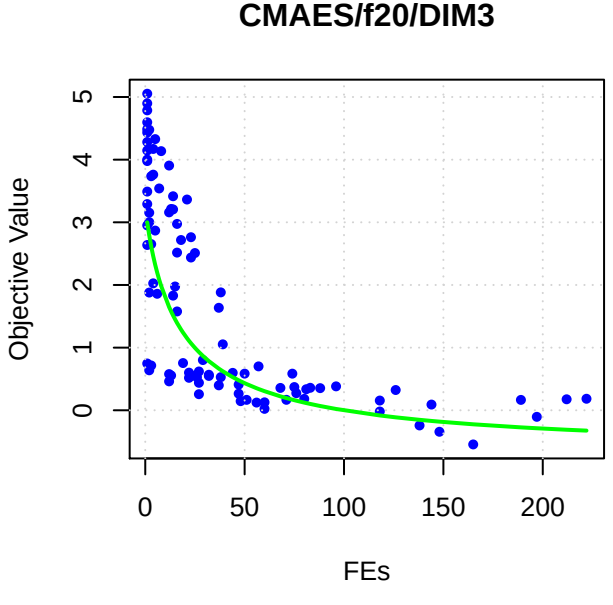

CMAES/f2/DIM40
Objective Value
FEs
0
1000
2000
3000
4000
4.5
5.5
6.5
7.5

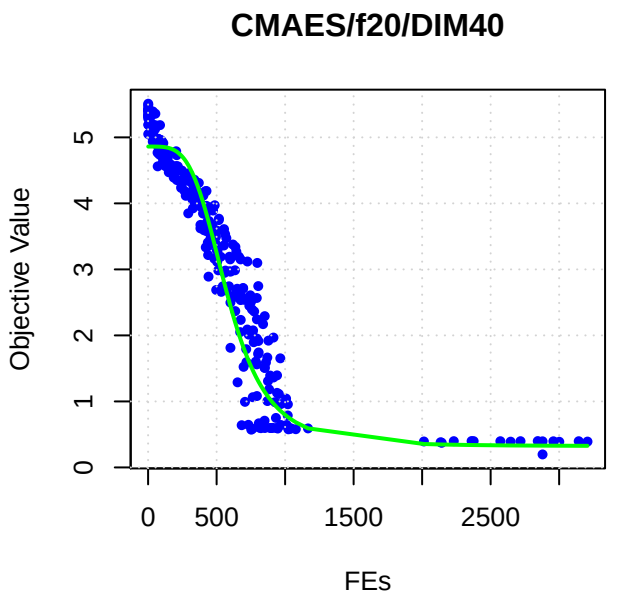

CMAES/f2/DIM5
Objective Value
FEs
0
100
200
300
400
500
2
3
4
5
6
7

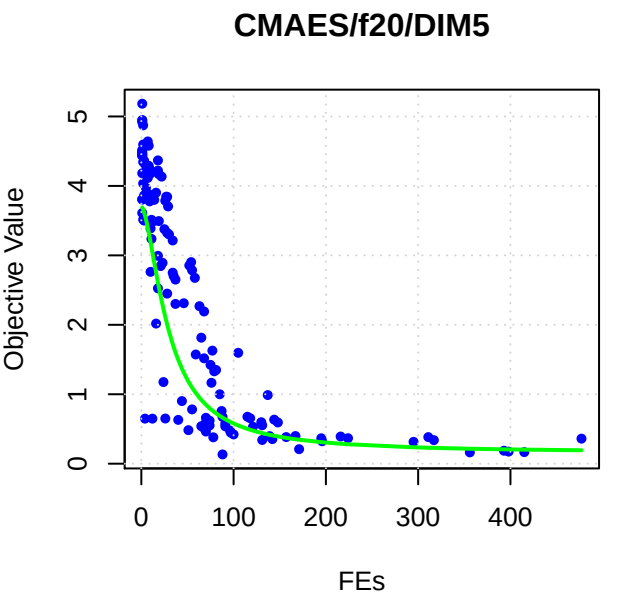

CMAES/f20/DIM10
Objective Value
FEs
0
1
2
3
4
5
0
200
400
600
800
1000

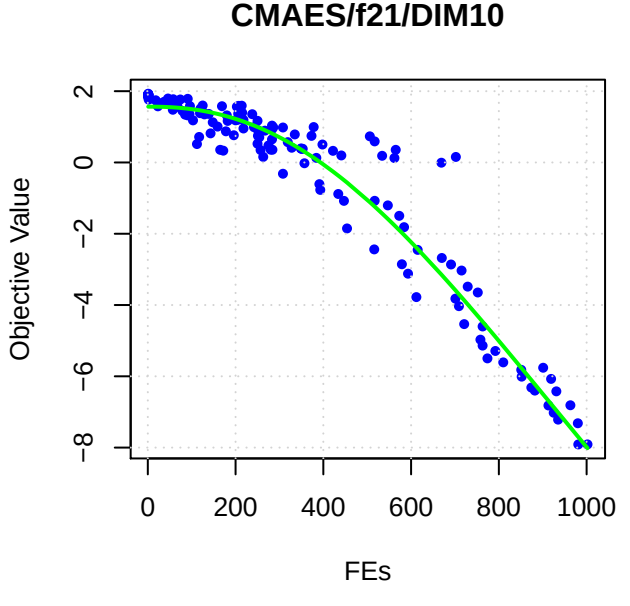

CMAES/f20/DIM2
Objective Value
FEs
−4
−2
0
2
4
0
50
100
150
200

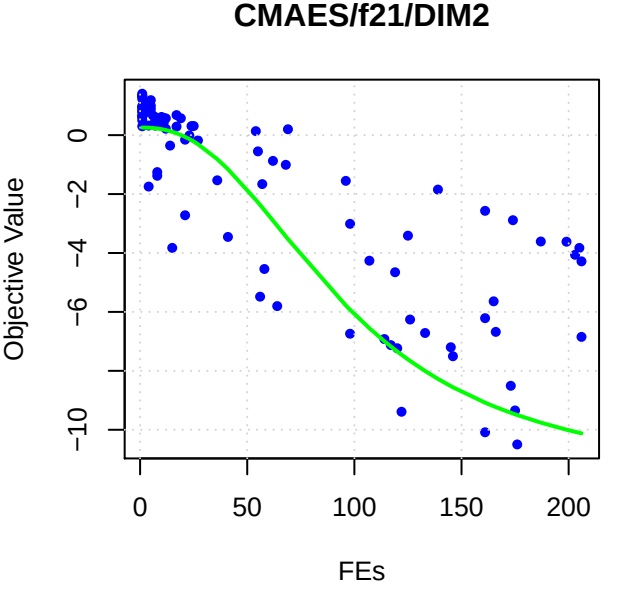

CMAES/f20/DIM20
Objective Value
FEs
0
1
2
3
4
5
0
500
1000
1500
2000

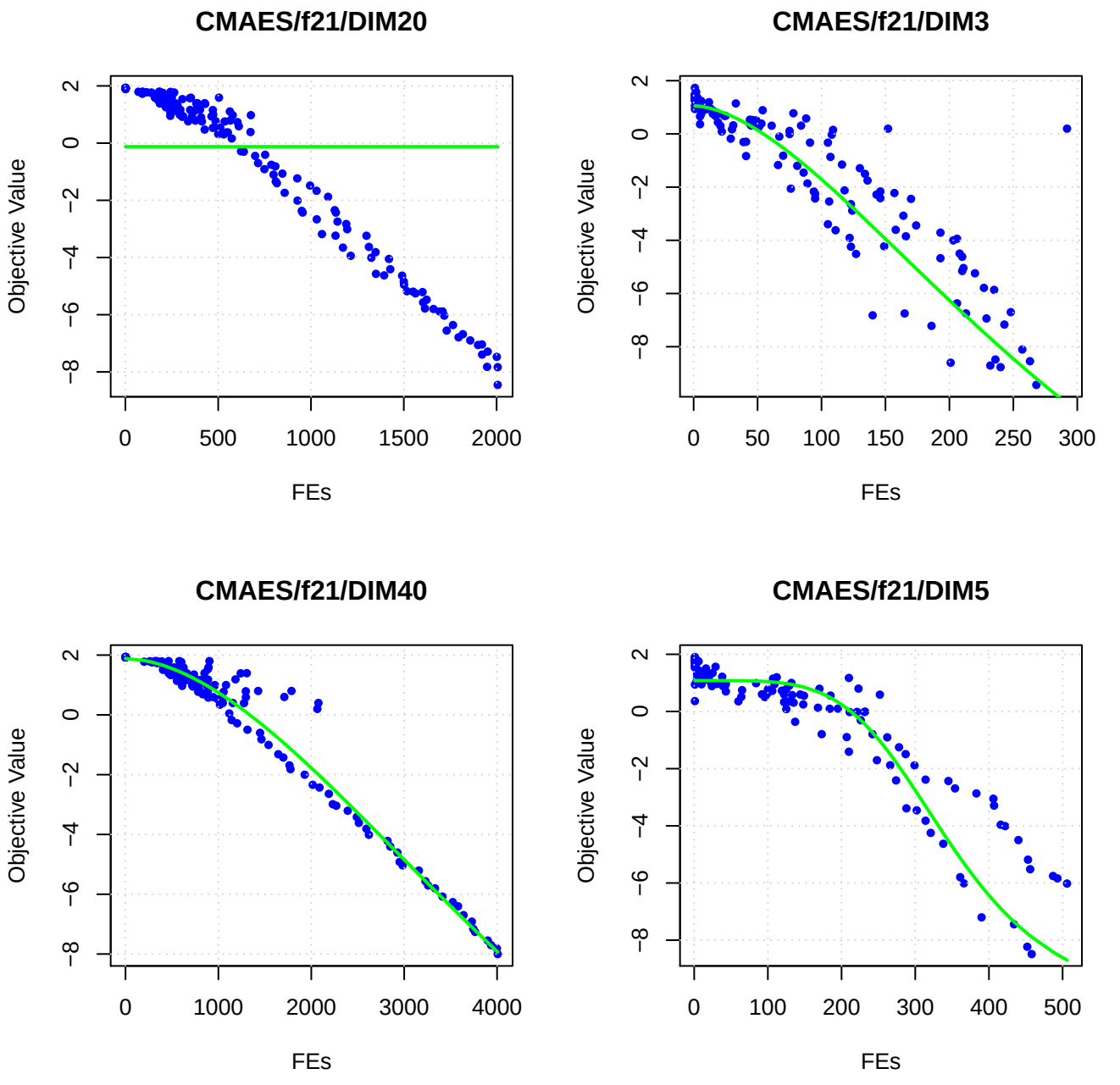

CMAES/f20/DIM3
Objective Value
FEs
0
1
2
3
4
5
0
50
100
150
200

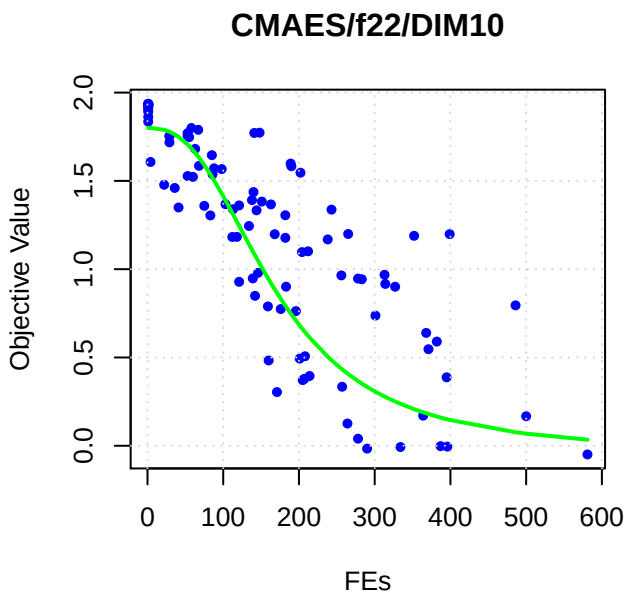

CMAES/f20/DIM40
Objective Value
FEs
0
1
2
3
4
5
0
500
1500
2500

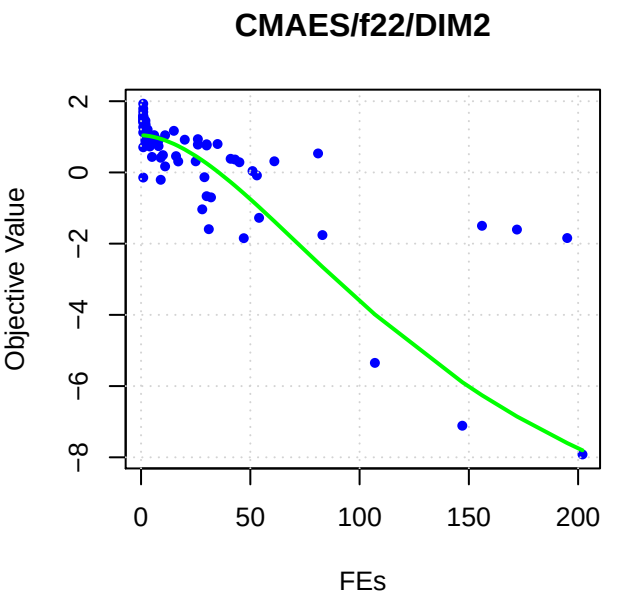

CMAES/f20/DIM5
Objective Value
FEs
0
1
2
3
4
5
0
100
200
300
400

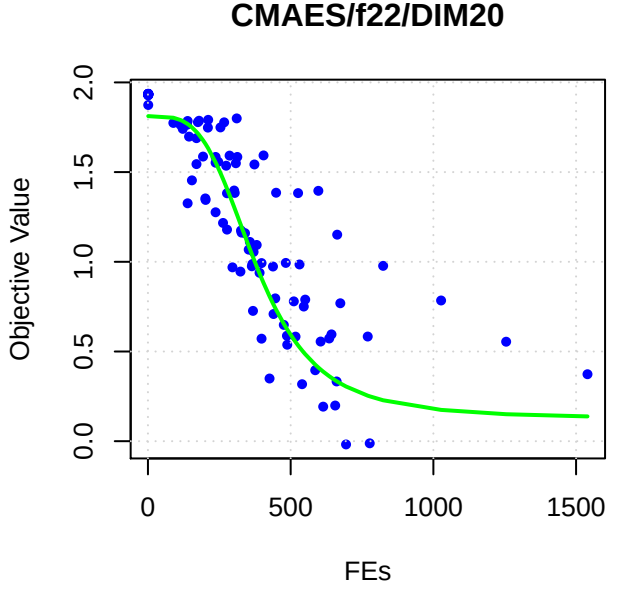

CMAES/f21/DIM10
Objective Value
FEs
2
0
−2
−4
−6
−8
0
200
400
600
800
1000

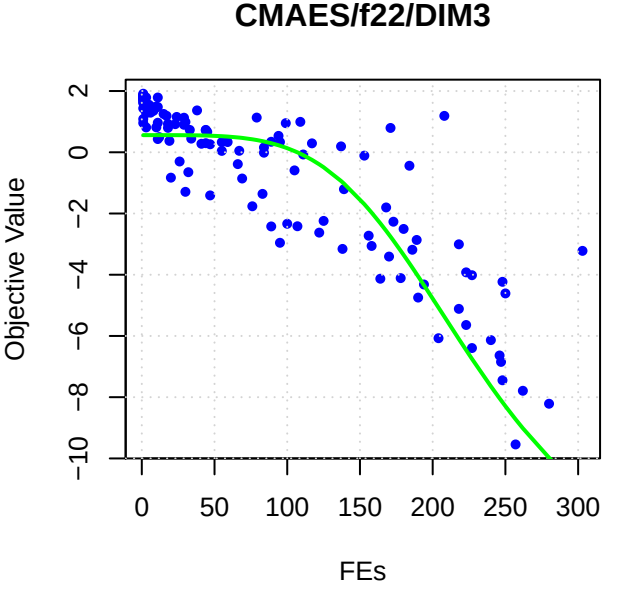

CMAES/f21/DIM2
Objective Value
FEs
0
−2
−4
−6
−10
0
50
100
150
200

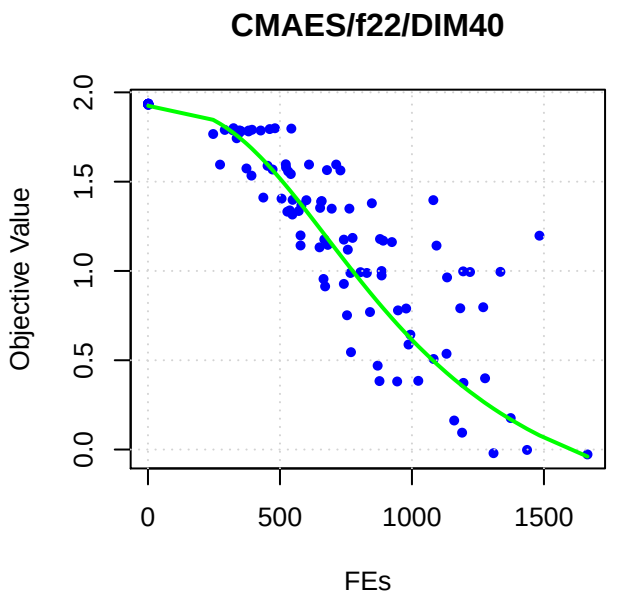

CMAES/f21/DIM20
Objective Value
FEs
2
0
−2
−4
−6
−8
0
500
1000
1500
2000
CMAES/f21/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
150
200
250
300
CMAES/f21/DIM40
Objective Value
FEs
2
0
−2
−4
−6
−8
0
1000
2000
3000
4000
CMAES/f21/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
100
200
300
400
500

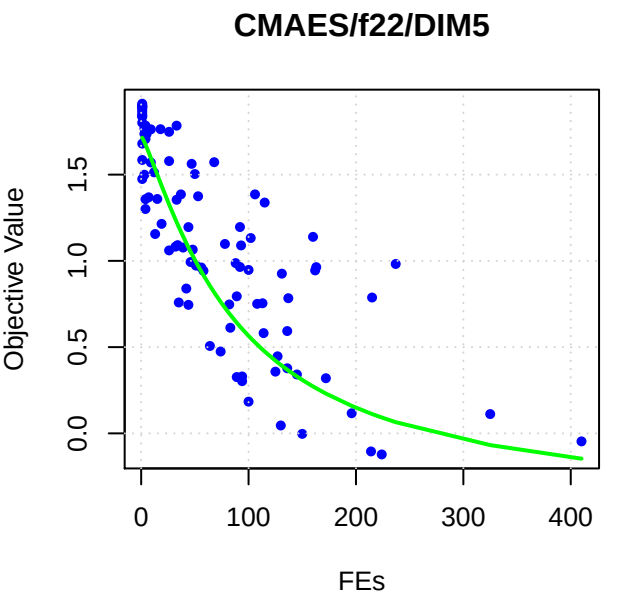

CMAES/f22/DIM10
Objective Value
FEs
0.0
0.5
1.0
1.5
2.0
0
100
200
300
400
500
600

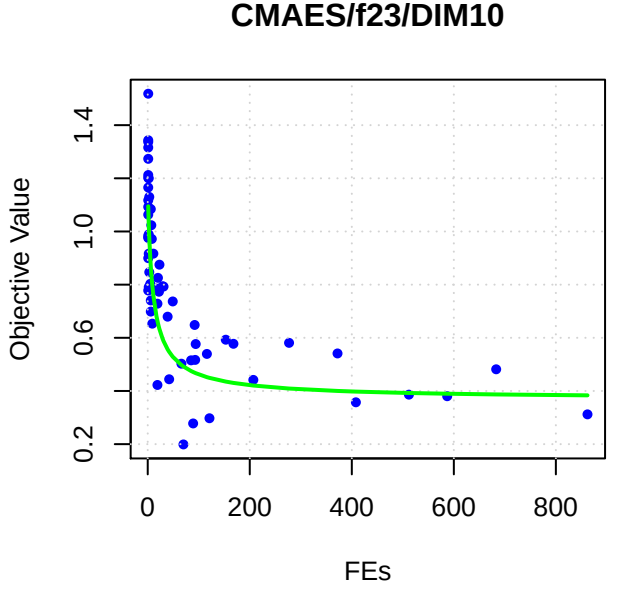

CMAES/f22/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
150
200

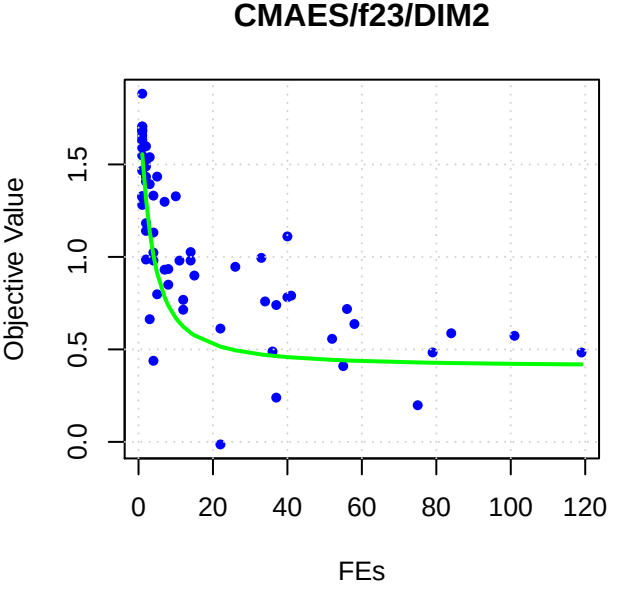

CMAES/f22/DIM20
Objective Value
FEs
0.0
0.5
1.0
1.5
2.0
0
500
1000
1500

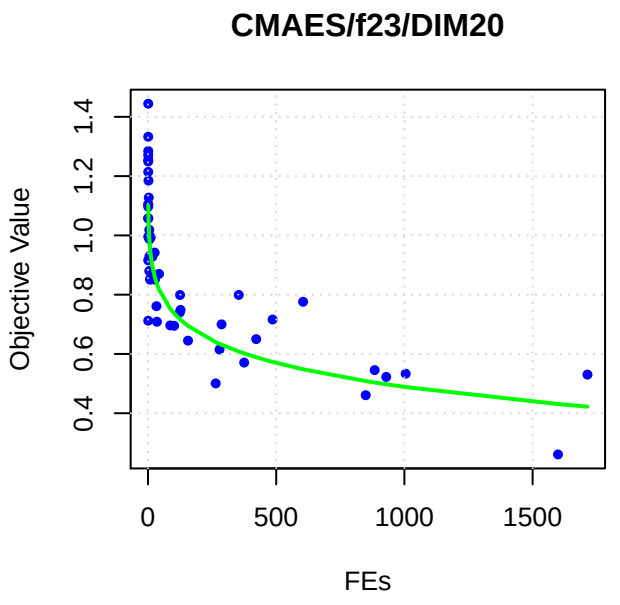

CMAES/f22/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
−10
0
50
100
150
200
250
300

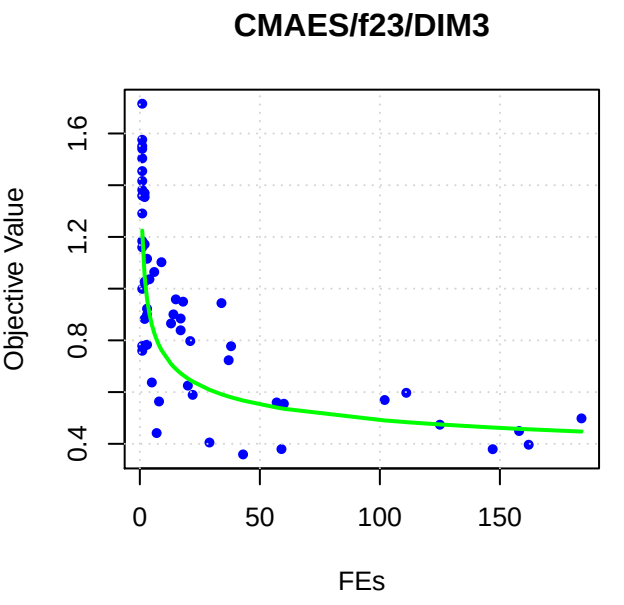

CMAES/f22/DIM40
Objective Value
FEs
0.0
0.5
1.0
1.5
2.0
0
500
1000
1500

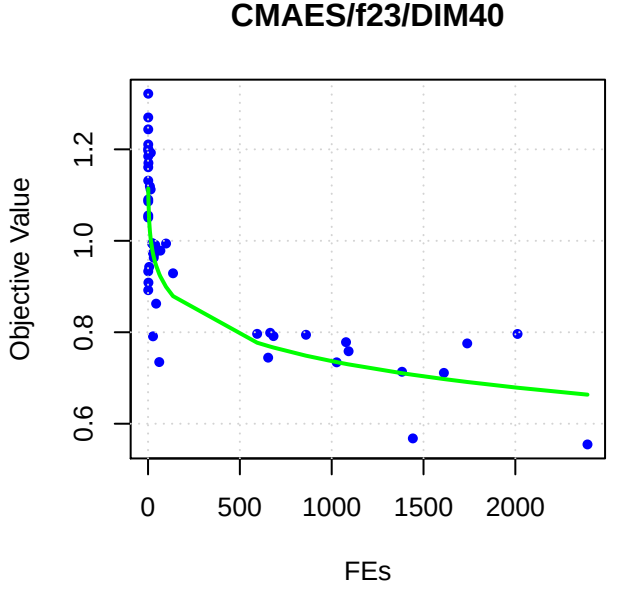

CMAES/f22/DIM5
Objective Value
FEs
0.0
0.5
1.0
1.5
0
100
200
300
400

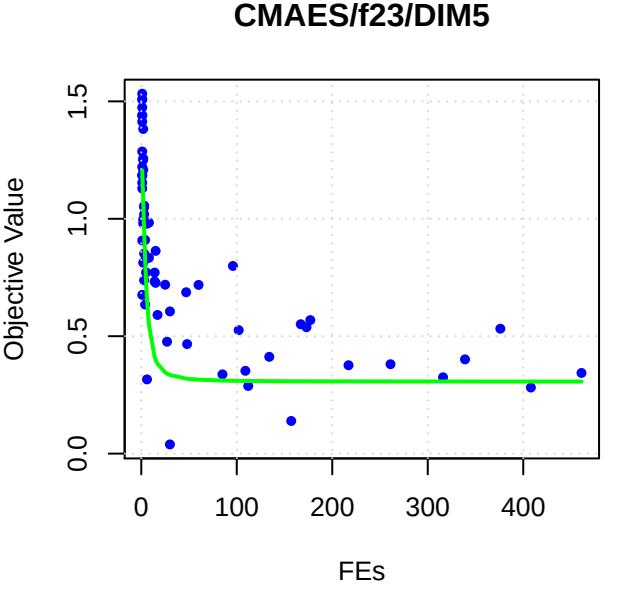

CMAES/f23/DIM10
Objective Value
FEs
0.2
0.6
1.0
1.4
0
200
400
600
800

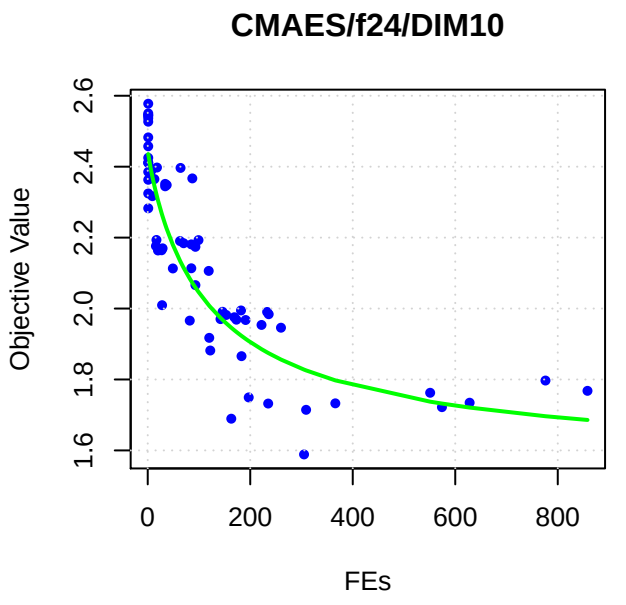

CMAES/f23/DIM2
Objective Value
FEs
0.0
0.5
1.0
1.5
0
20
40
60
80
100
120

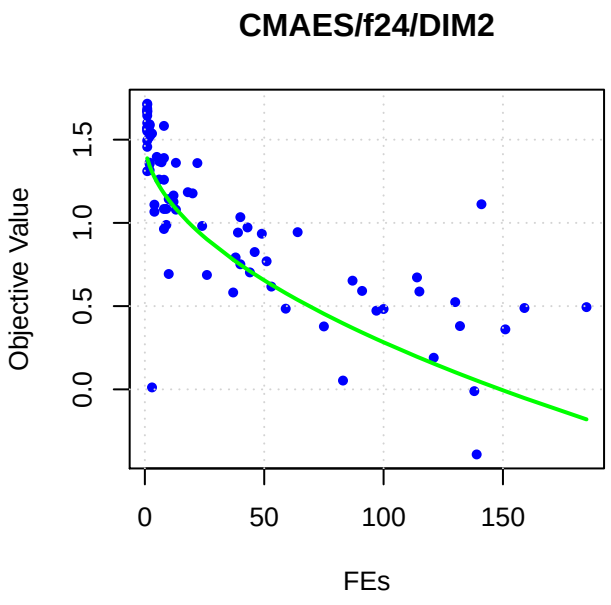

CMAES/f23/DIM20
Objective Value
0.4
0.6
0.8
1.0
1.2
1.4
0
500
1000
1500
FEs

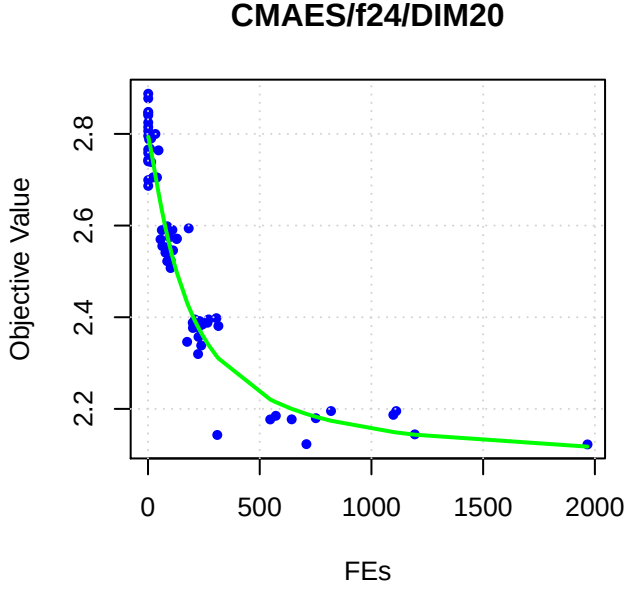

CMAES/f23/DIM3
Objective Value
0.4
0.8
1.2
1.6
0
50
100
150
FEs

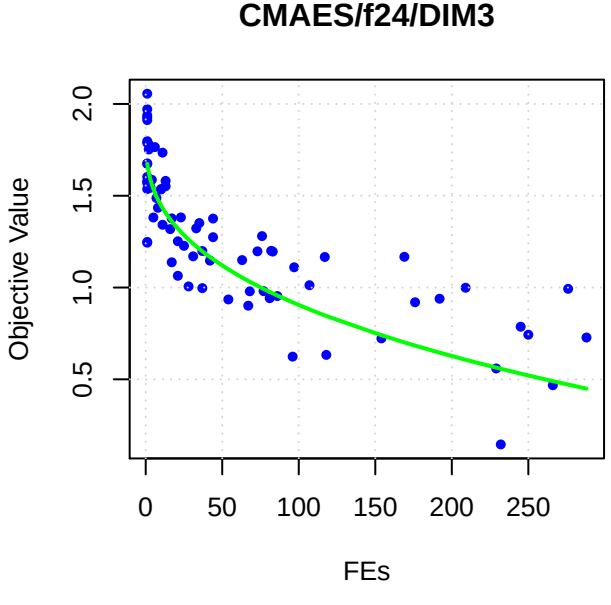

CMAES/f23/DIM40
Objective Value
0.6
0.8
1.0
1.2
0
500
1000
1500
2000
FEs

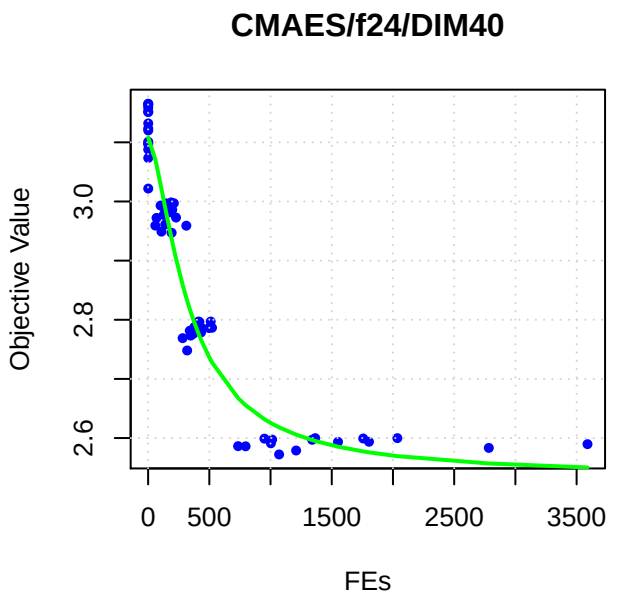

CMAES/f23/DIM5
Objective Value
0.0
0.5
1.0
1.5
0
100
200
300
400
FEs

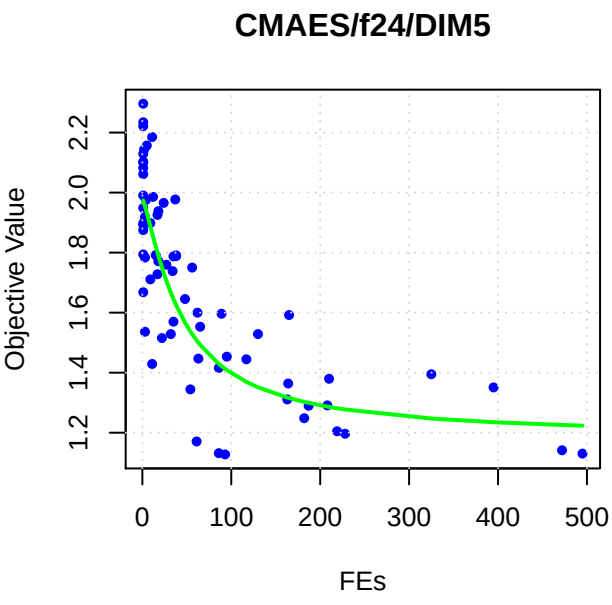

CMAES/f24/DIM10
Objective Value
1.6
1.8
2.0
2.2
2.4
2.6
0
200
400
600
800
FEs

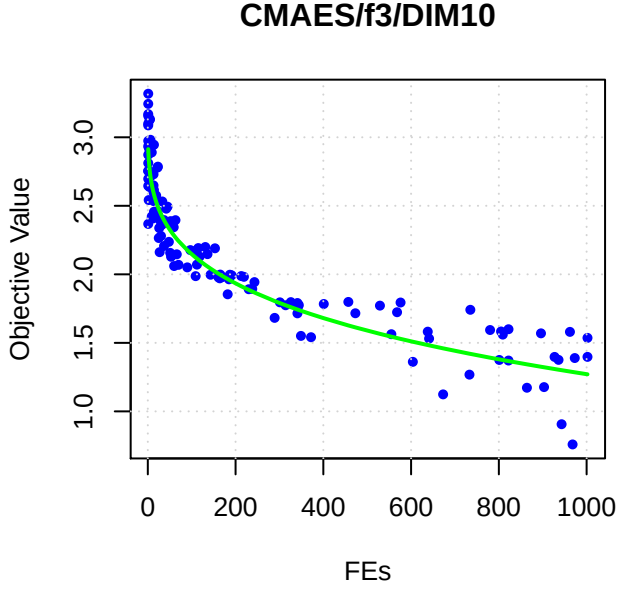

CMAES/f24/DIM2
Objective Value
0.0
0.5
1.0
1.5
0
50
100
150
FEs


CMAES/f24/DIM20
Objective Value
2.2
2.4
2.6
2.8
0
500
1000
1500
2000
FEs


CMAES/f24/DIM3
Objective Value
0.5
1.0
1.5
2.0
0
50
100
150
200
250
FEs


CMAES/f24/DIM40
Objective Value
2.6
2.8
3.0
0
500
1500
2500
3500
FEs


CMAES/f24/DIM5
Objective Value
1.2
1.4
1.6
1.8
2.0
2.2
0
100
200
300
400
500
FEs


CMAES/f3/DIM10
Objective Value
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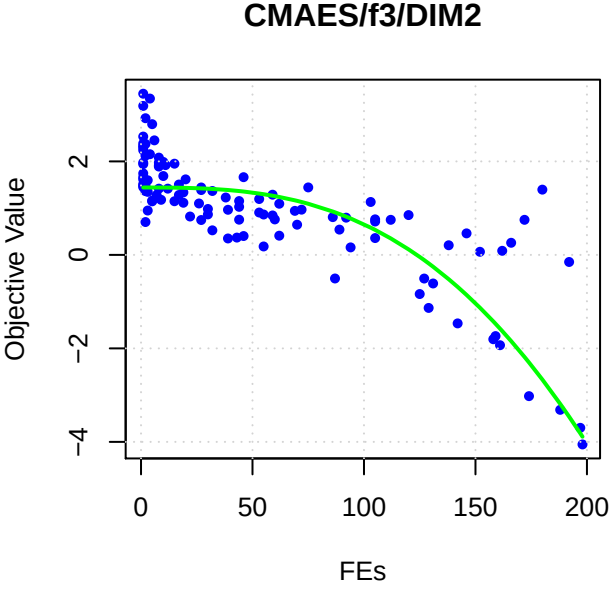
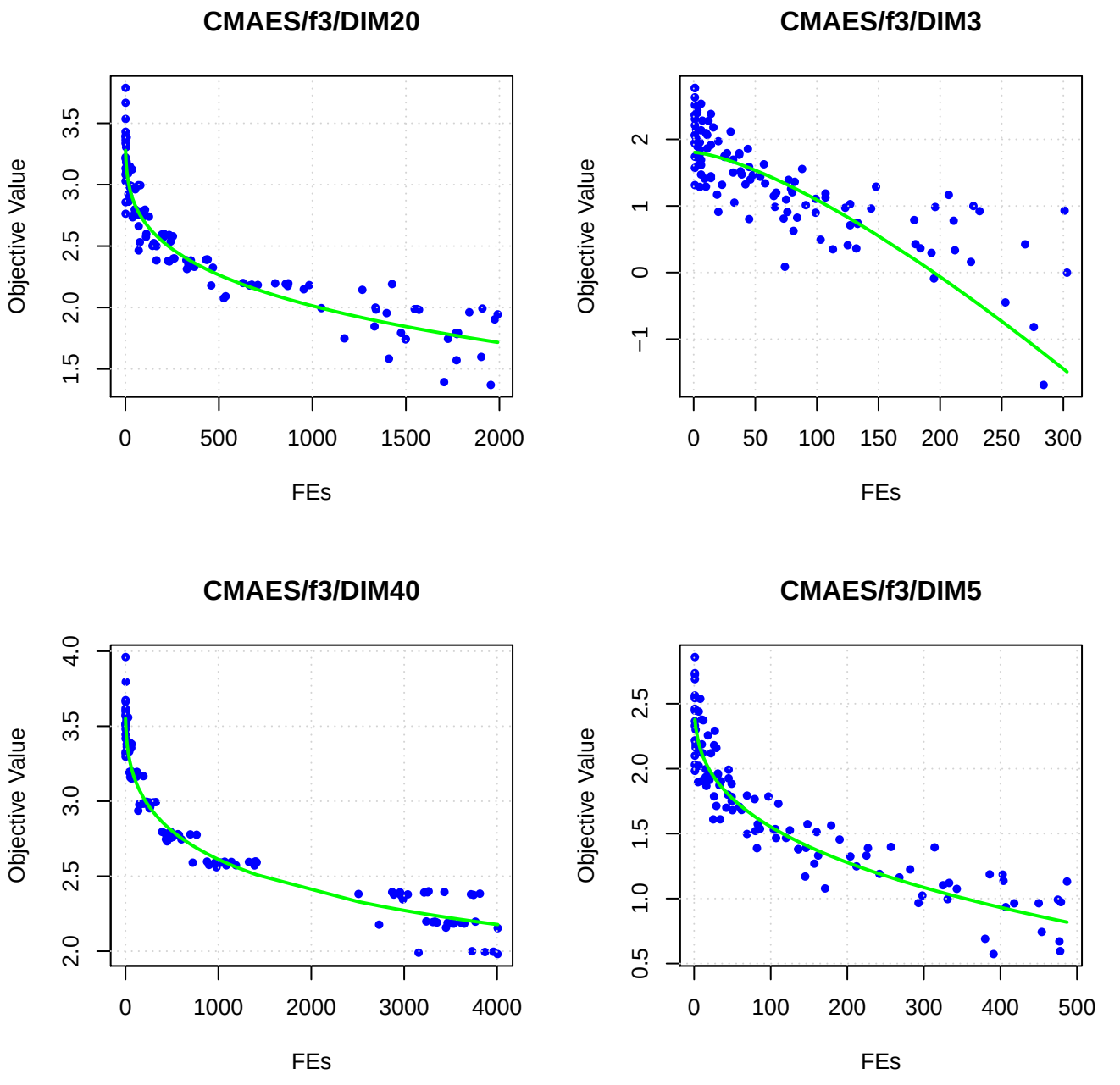
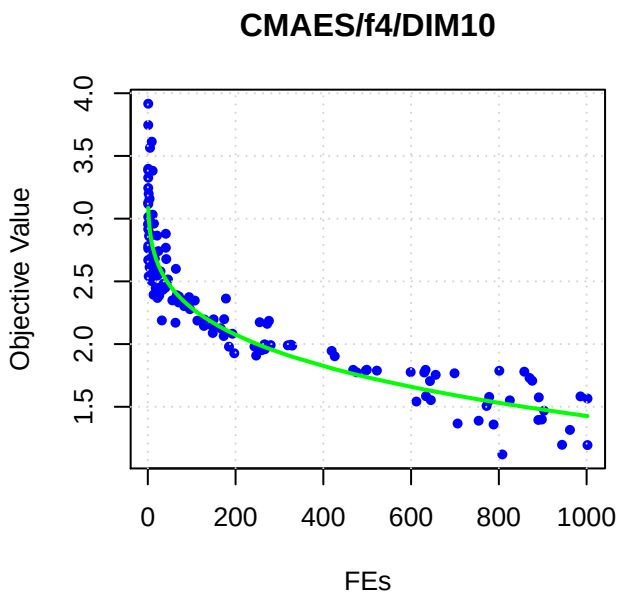
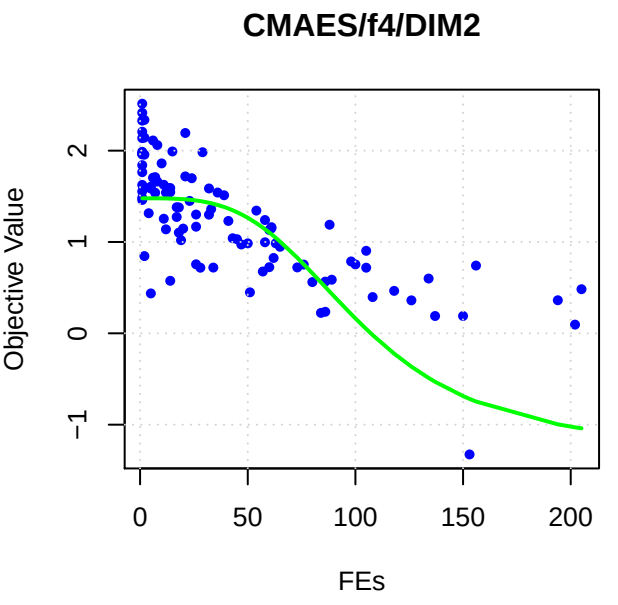
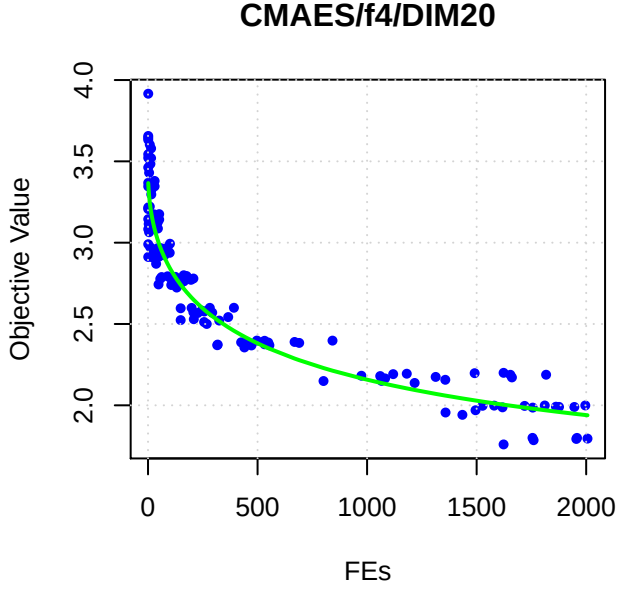
1.5
2.0
2.5
3.0
0
200
400
600
800
1000
FEs

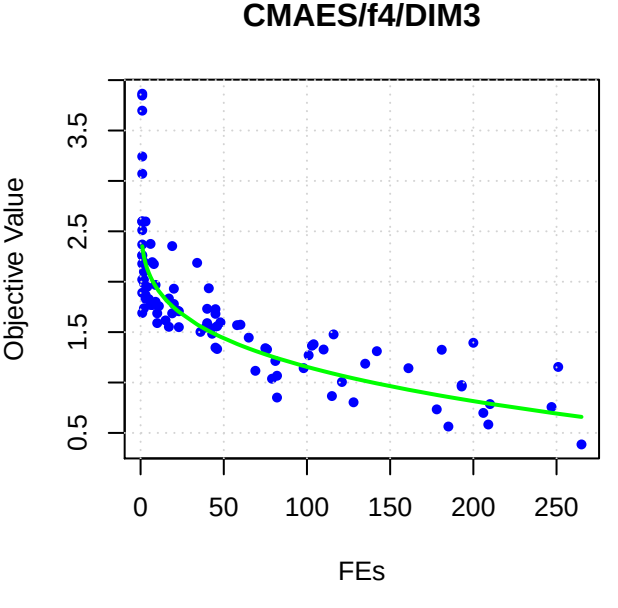

CMAES/f3/DIM2
Objective Value
−4
−2
0
2
0
50
100
150
200
FEs

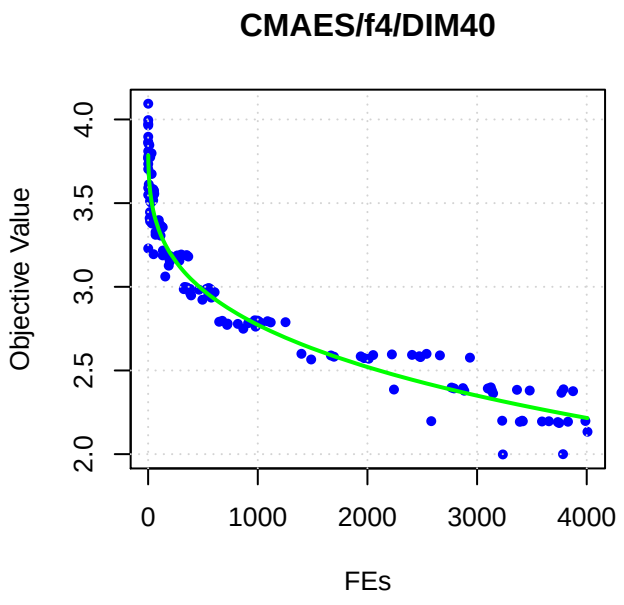

CMAES/f3/DIM20
Objective Value
FEs
CMAES/f3/DIM3
Objective Value
FEs
CMAES/f3/DIM40
Objective Value
FEs
CMAES/f3/DIM5
Objective Value
FEs

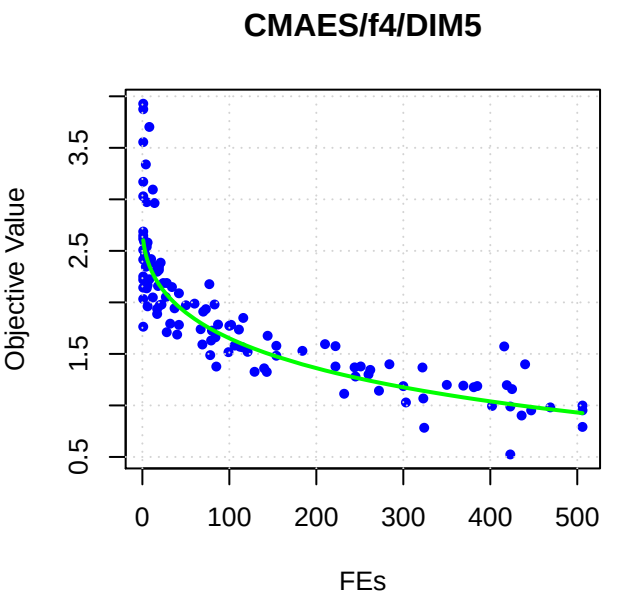

CMAES/f4/DIM10
Objective Value
FEs
1.5
2.0
2.5
3.0
3.5
4.0
0
200
400
600
800
1000

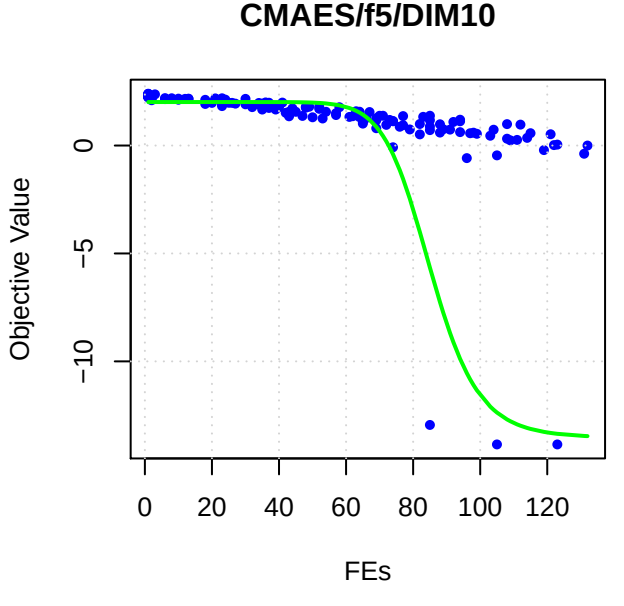

CMAES/f4/DIM2
Objective Value
FEs
−1
0
1
2
0
50
100
150
200

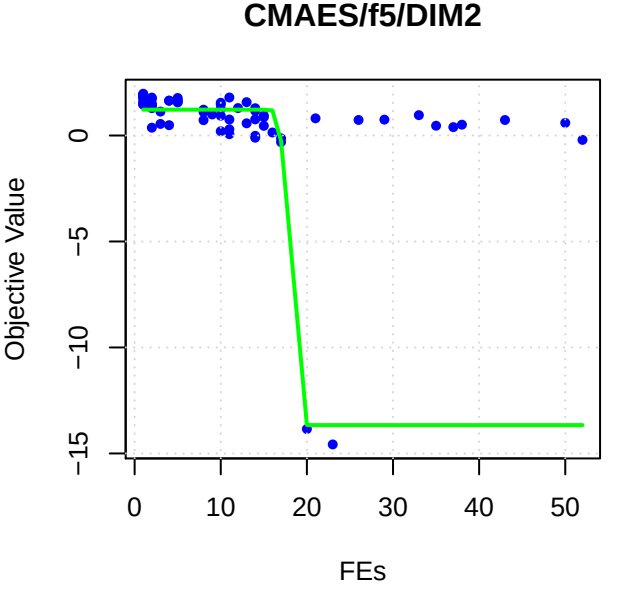

CMAES/f4/DIM20
Objective Value
FEs
2.0
2.5
3.0
3.5
4.0
0
500
1000
1500
2000

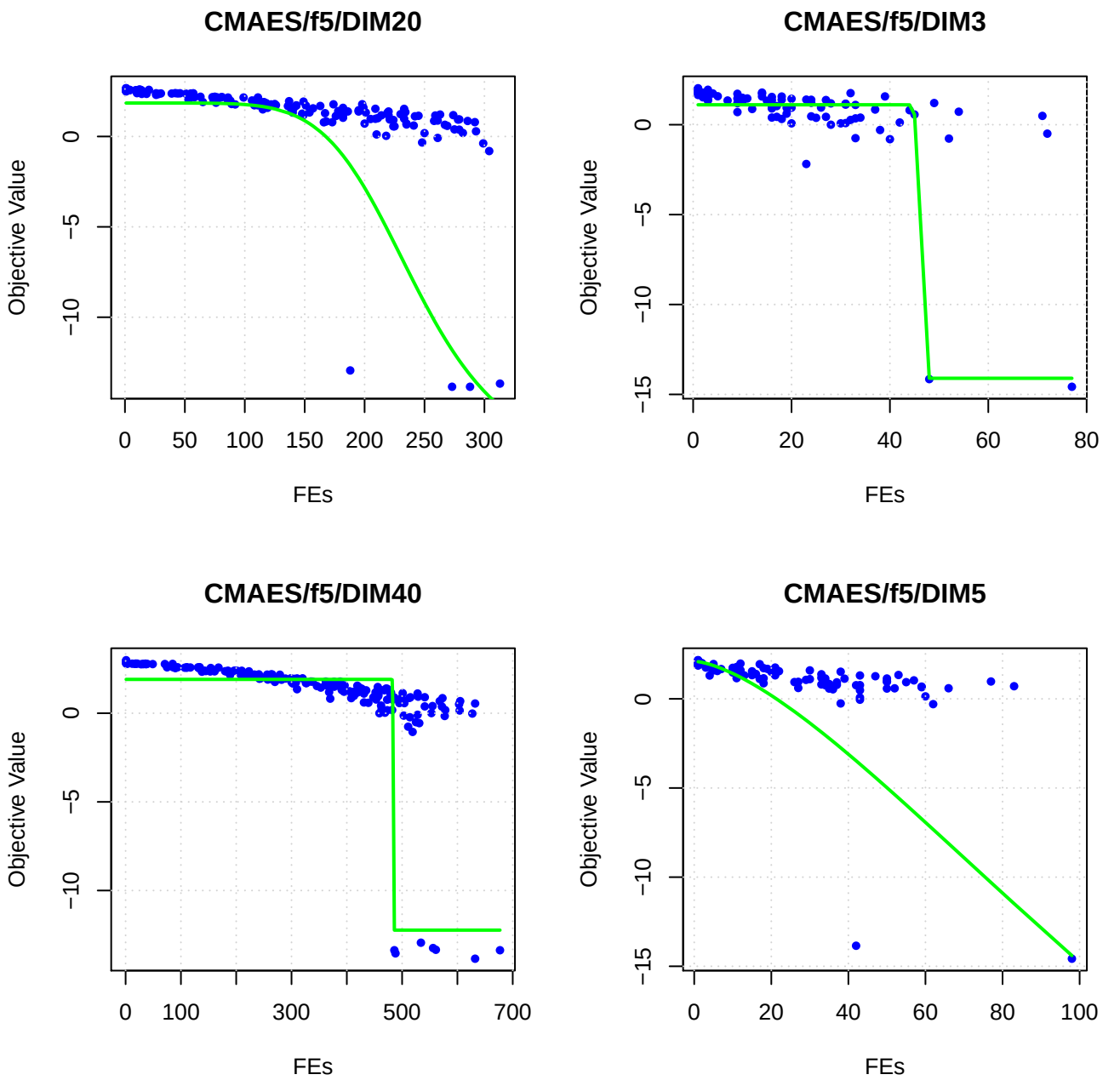

CMAES/f4/DIM3
Objective Value
FEs
0.5
1.5
2.5
3.5
0
50
100
150
200
250

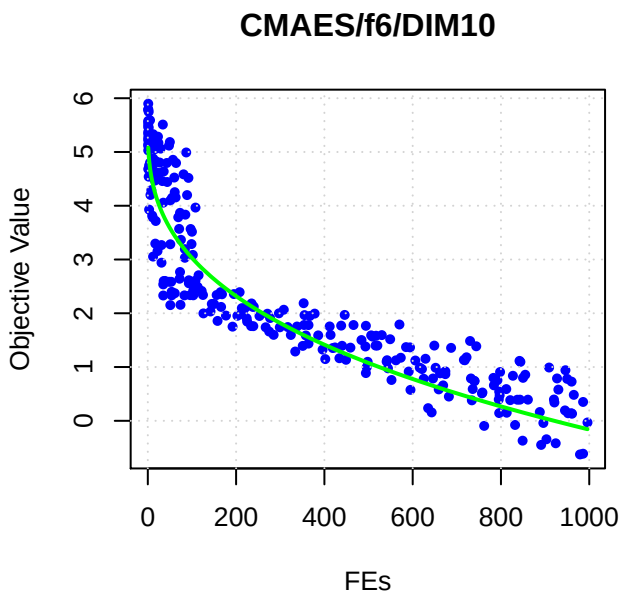

CMAES/f4/DIM40
Objective Value
FEs
2.0
2.5
3.0
3.5
4.0
0
1000
2000
3000
4000

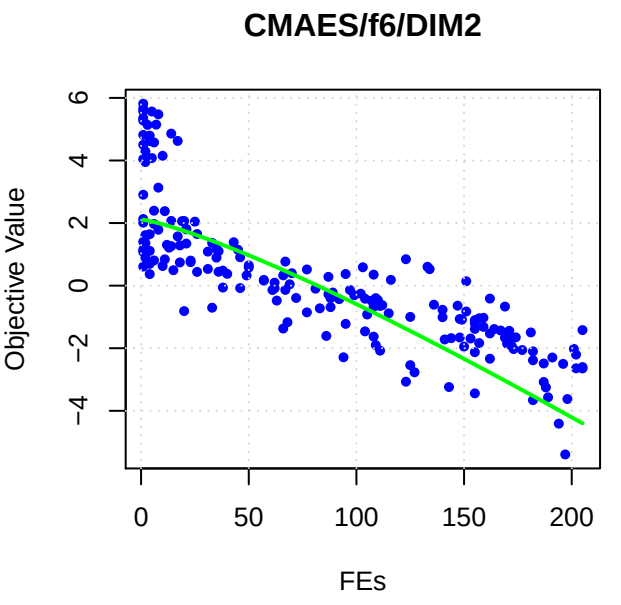

CMAES/f4/DIM5
Objective Value
FEs
0.5
1.5
2.5
3.5
0
100
200
300
400
500

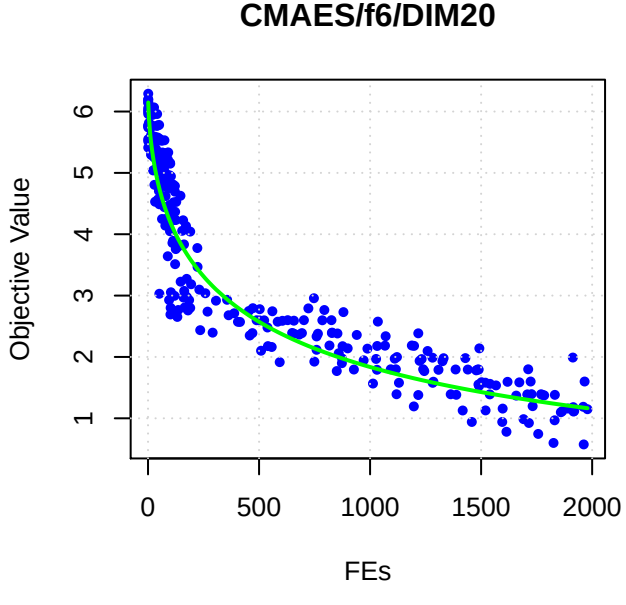

CMAES/f5/DIM10
Objective Value
FEs
−10
−5
0
0
20
40
60
80
100
120

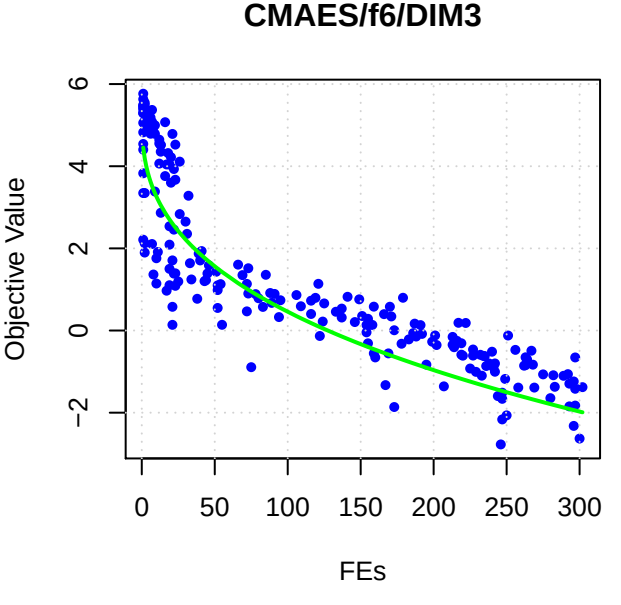

CMAES/f5/DIM2
Objective Value
FEs
−15
−10
−5
0
0
10
20
30
40
50

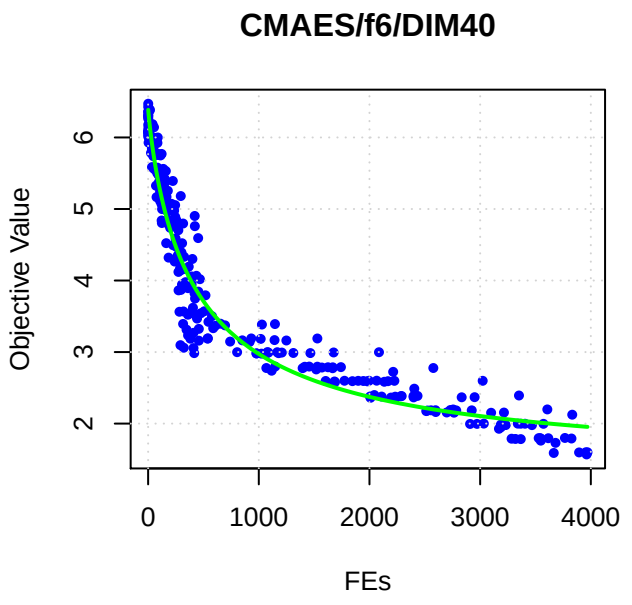

CMAES/f5/DIM20
Objective Value
0
−5
−10
0
50
100
150
200
250
300
FEs
CMAES/f5/DIM3
Objective Value
0
−5
−10
−15
0
20
40
60
80
FEs
CMAES/f5/DIM40
Objective Value
0
−5
−10
0
100
300
500
700
FEs
CMAES/f5/DIM5
Objective Value
0
−5
−10
−15
0
20
40
60
80
100
FEs

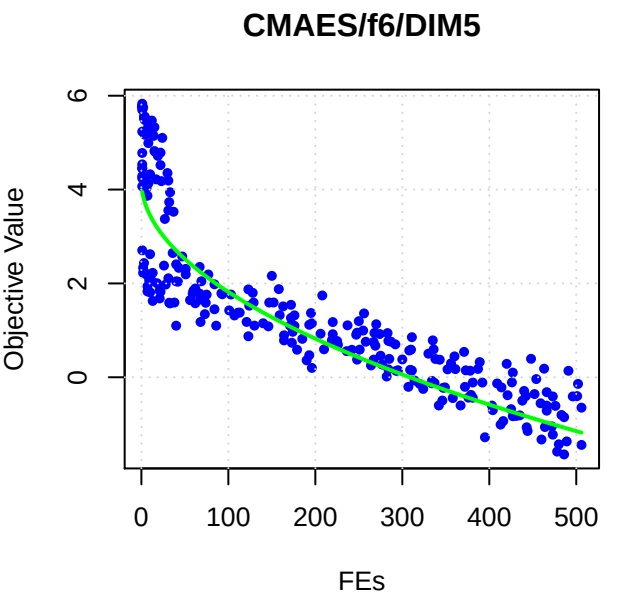

CMAES/f6/DIM10
Objective Value
FEs
0
1
2
3
4
5
6
0
200
400
600
800
1000

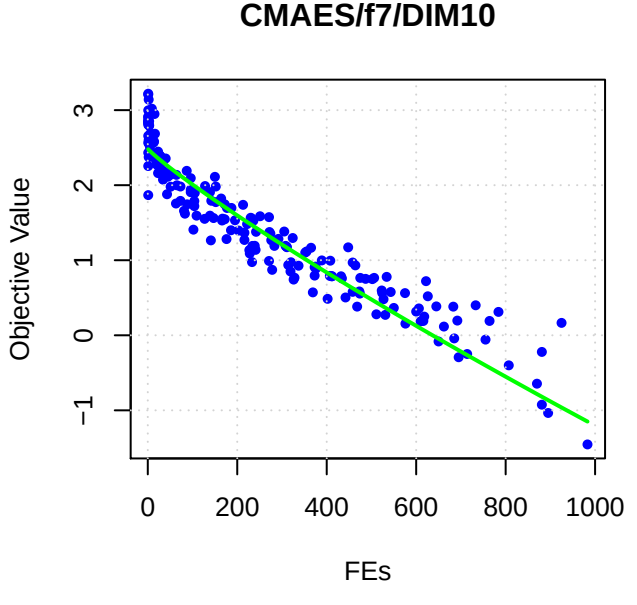

CMAES/f6/DIM2
Objective Value
FEs
−4
−2
0
2
4
6
0
50
100
150
200

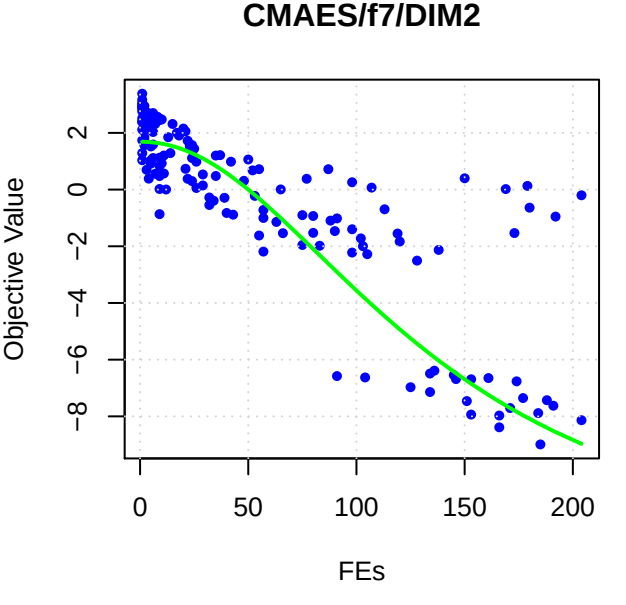

CMAES/f6/DIM20
Objective Value
FEs
1
2
3
4
5
6
0
500
1000
1500
2000

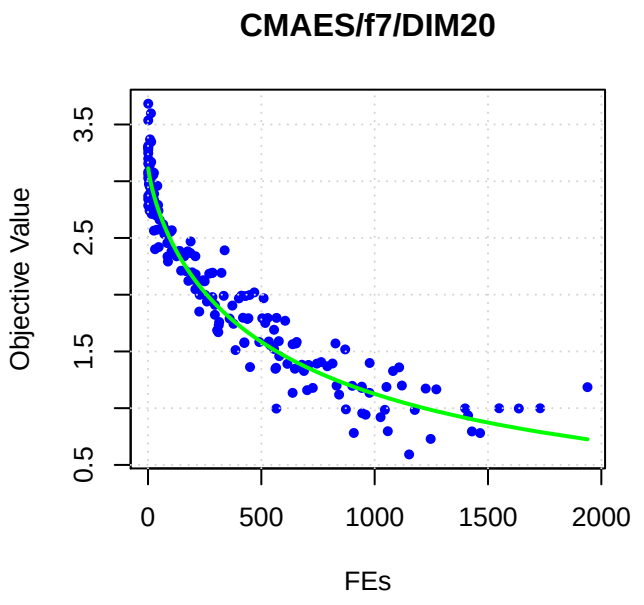

CMAES/f6/DIM3
Objective Value
FEs
−2
0
2
4
6
0
50
100
150
200
250
300


CMAES/f6/DIM40
Objective Value
FEs
0
1000
2000
3000
4000
2
3
4
5
6


CMAES/f6/DIM5
Objective Value
FEs
0
100
200
300
400
500
0
2
4
6


CMAES/f7/DIM10
Objective Value
FEs
0
200
400
600
800
1000
−1
0
1
2
3


CMAES/f7/DIM2
Objective Value
FEs
0
50
100
150
200
−8
−6
−4
−2
0
2


CMAES/f7/DIM20
Objective Value
FEs
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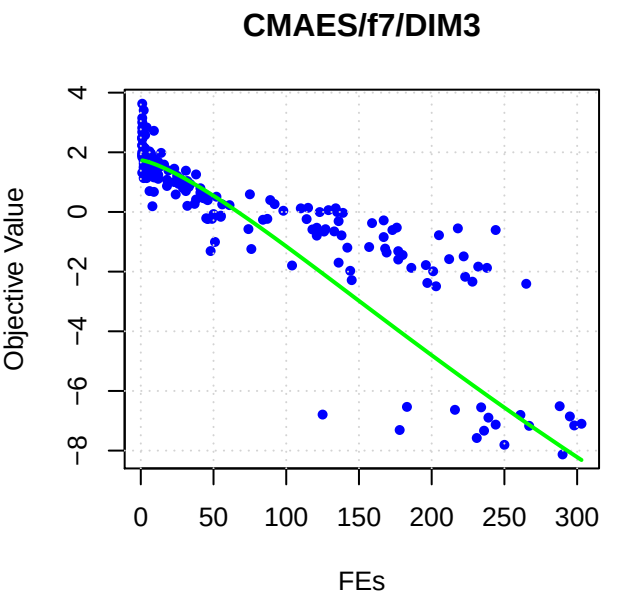
1.5
2.5
3.5
0
500
1000
1500
2000


CMAES/f7/DIM3
Objective Value
FEs
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−6
−4
−2
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2
4
0
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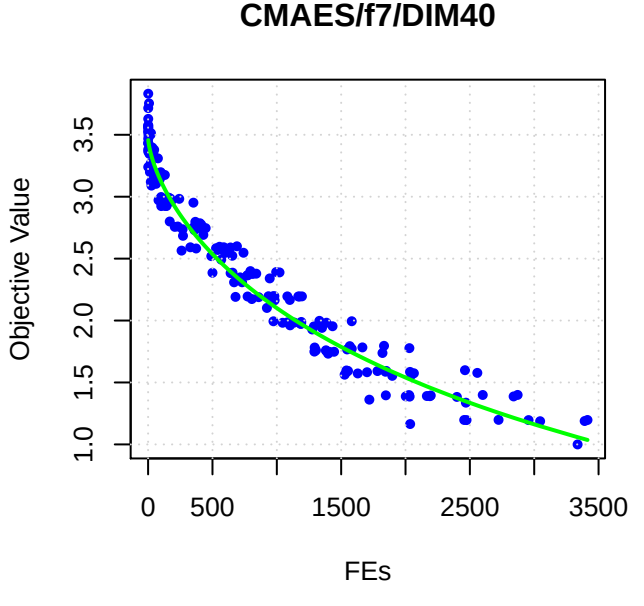
100
150
200
250
300


CMAES/f7/DIM40
Objective Value
FEs
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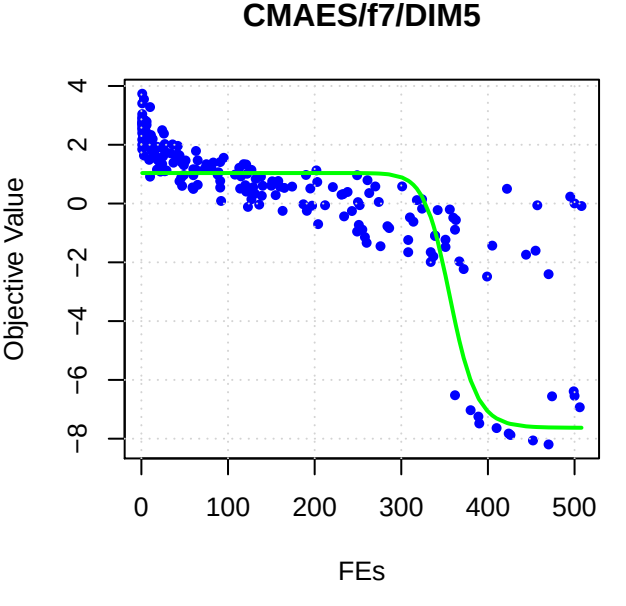
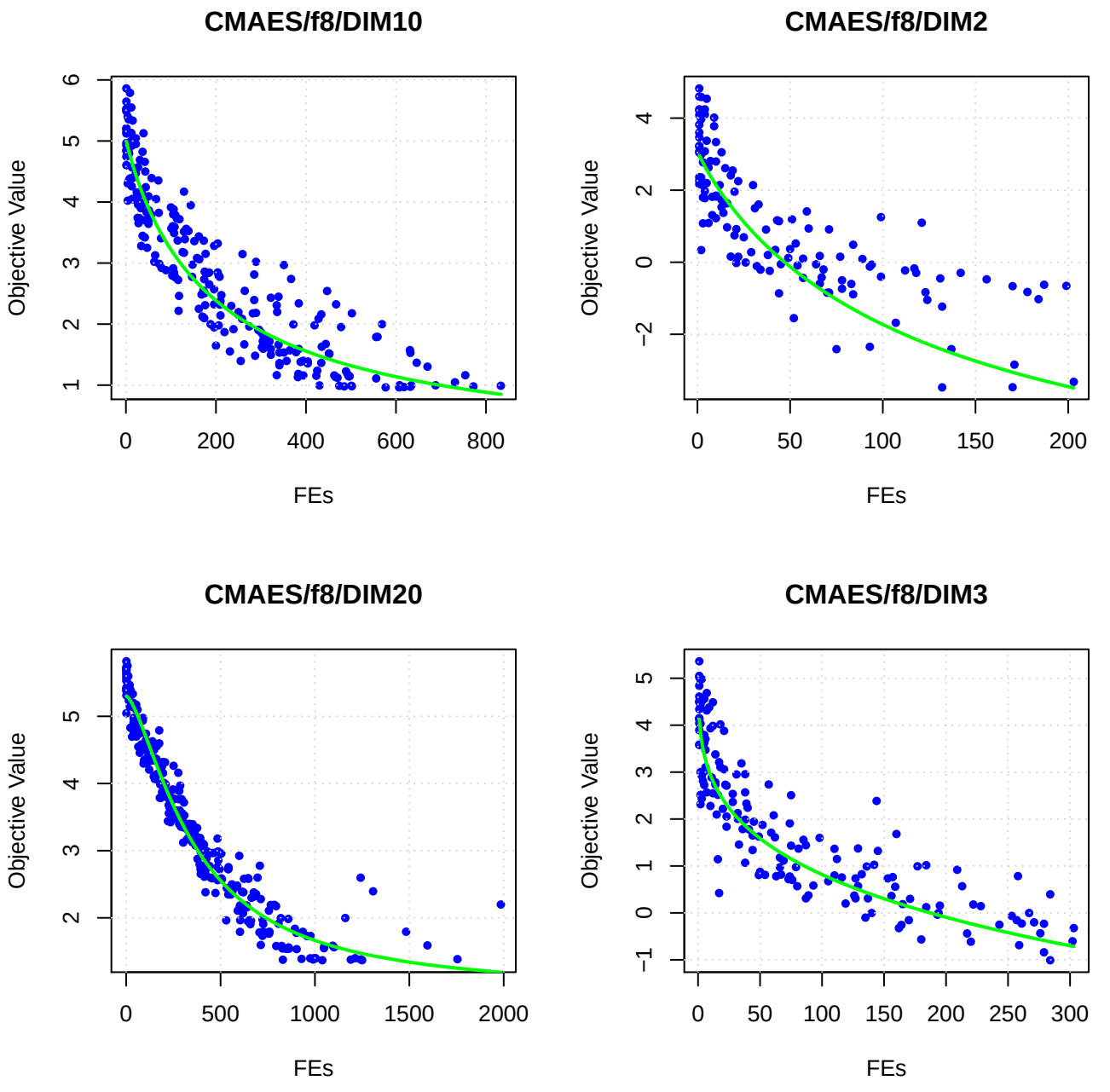
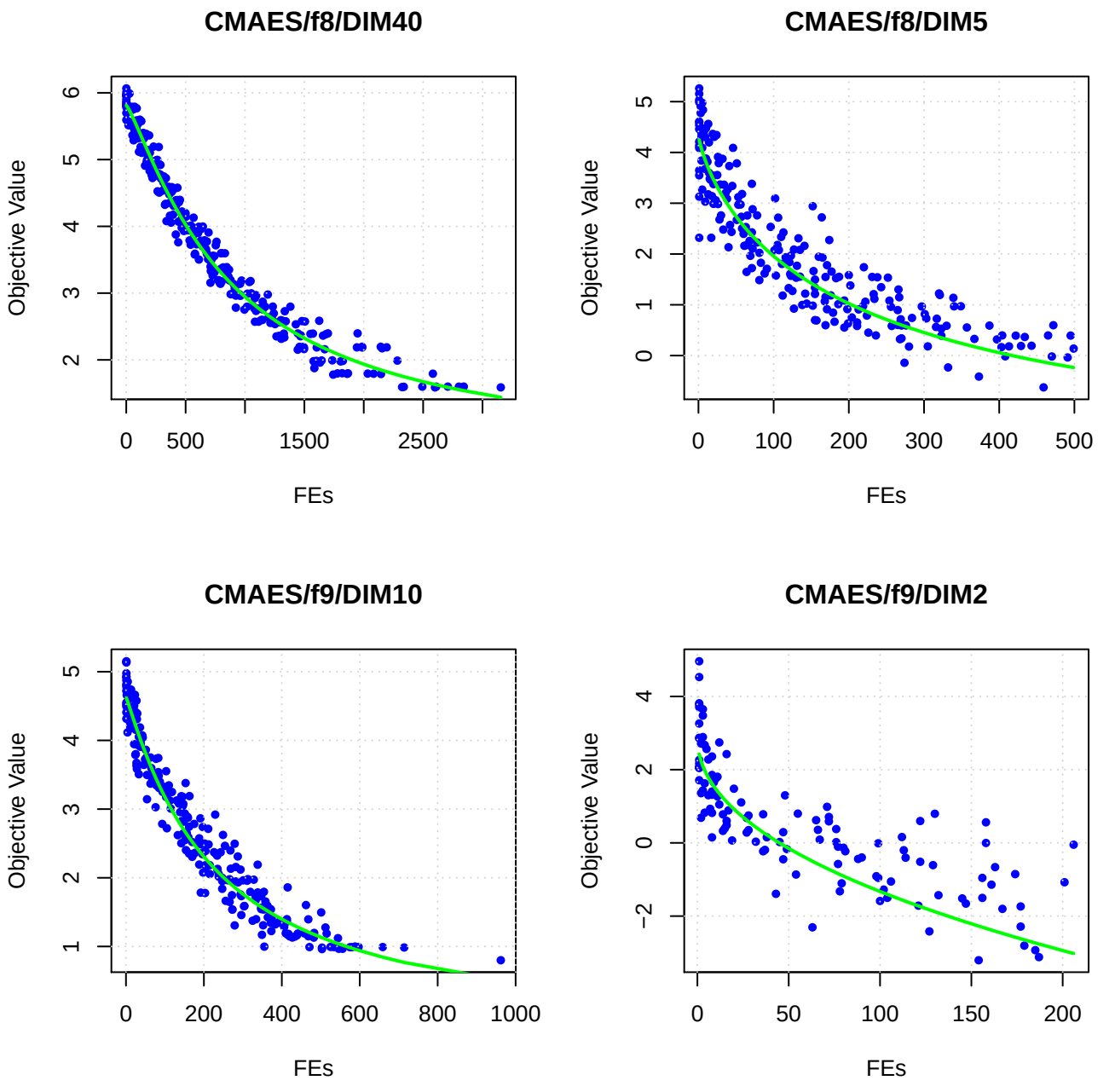
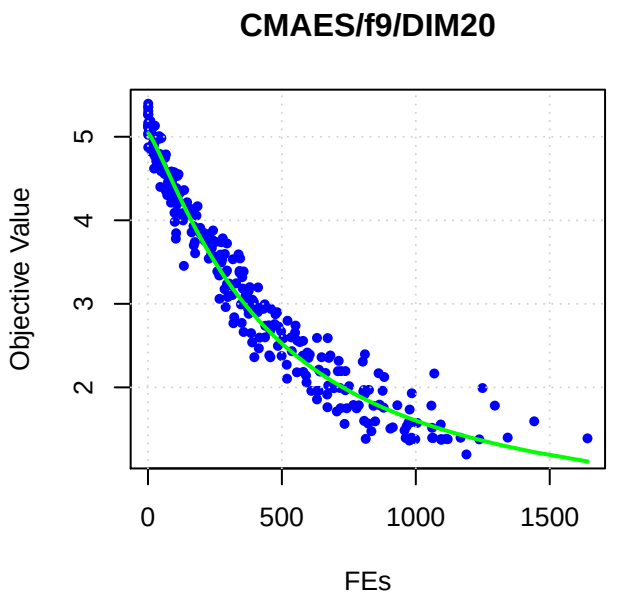
1.5
2.0
2.5
3.0
3.5
0
500
1500
2500
3500


CMAES/f7/DIM5
Objective Value
FEs
−8
−6
−4
−2
0
2
4
0
100
200
300
400
500


CMAES/f8/DIM10
Objective Value
FEs
CMAES/f8/DIM2
Objective Value
FEs
CMAES/f8/DIM20
Objective Value
FEs
CMAES/f8/DIM3
Objective Value
FEs


CMAES/f8/DIM40
Objective Value
FEs
CMAES/f8/DIM5
Objective Value
FEs
CMAES/f9/DIM10
Objective Value
FEs
CMAES/f9/DIM2
Objective Value
FEs


CMAES/f9/DIM20
Objective Value
FEs
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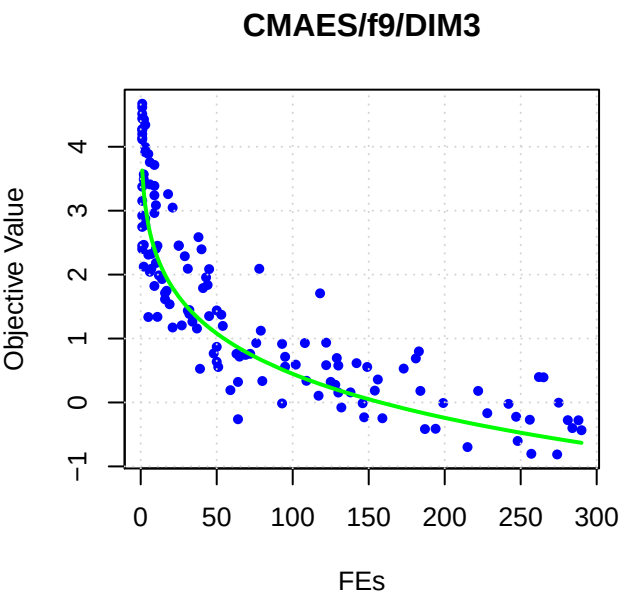
1000
1500
2
3
4
5


CMAES/f9/DIM3
Objective Value
FEs
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100
150
200
250
300
−1
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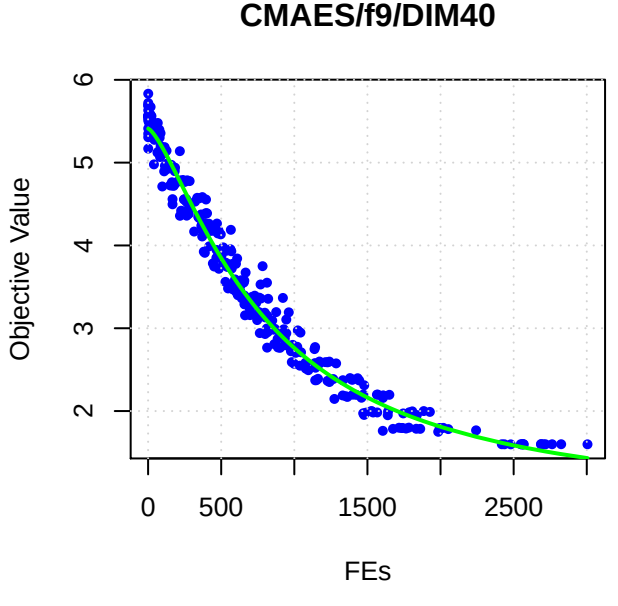
1
2
3
4


CMAES/f9/DIM40
Objective Value
FEs
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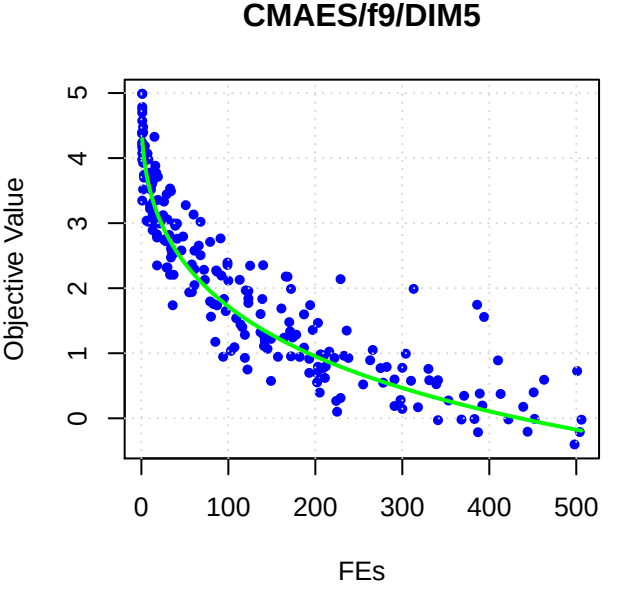
1500
2500
2
3
4
5
6


CMAES/f9/DIM5
Objective Value
FEs
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200
300
400
500
0
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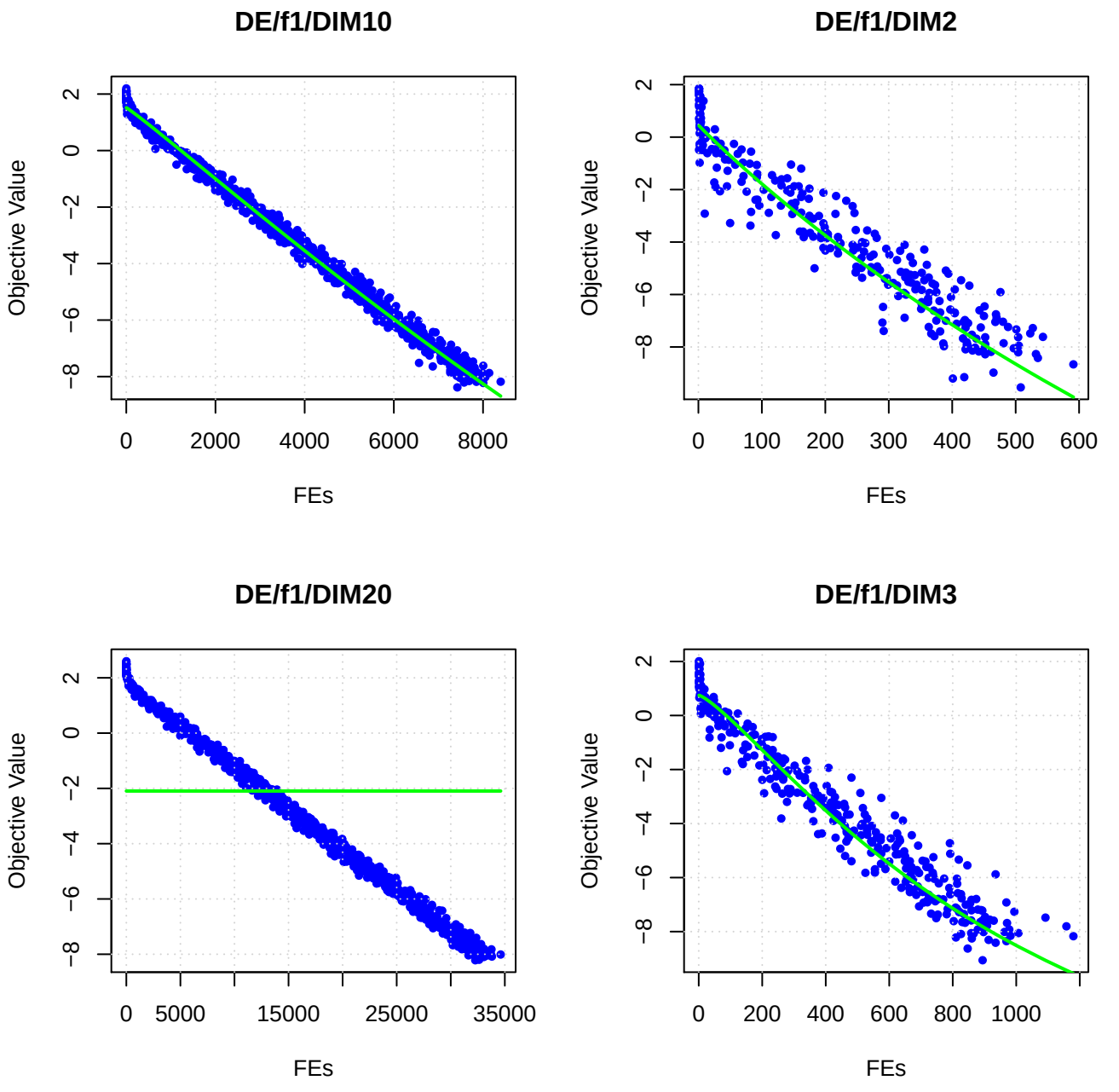
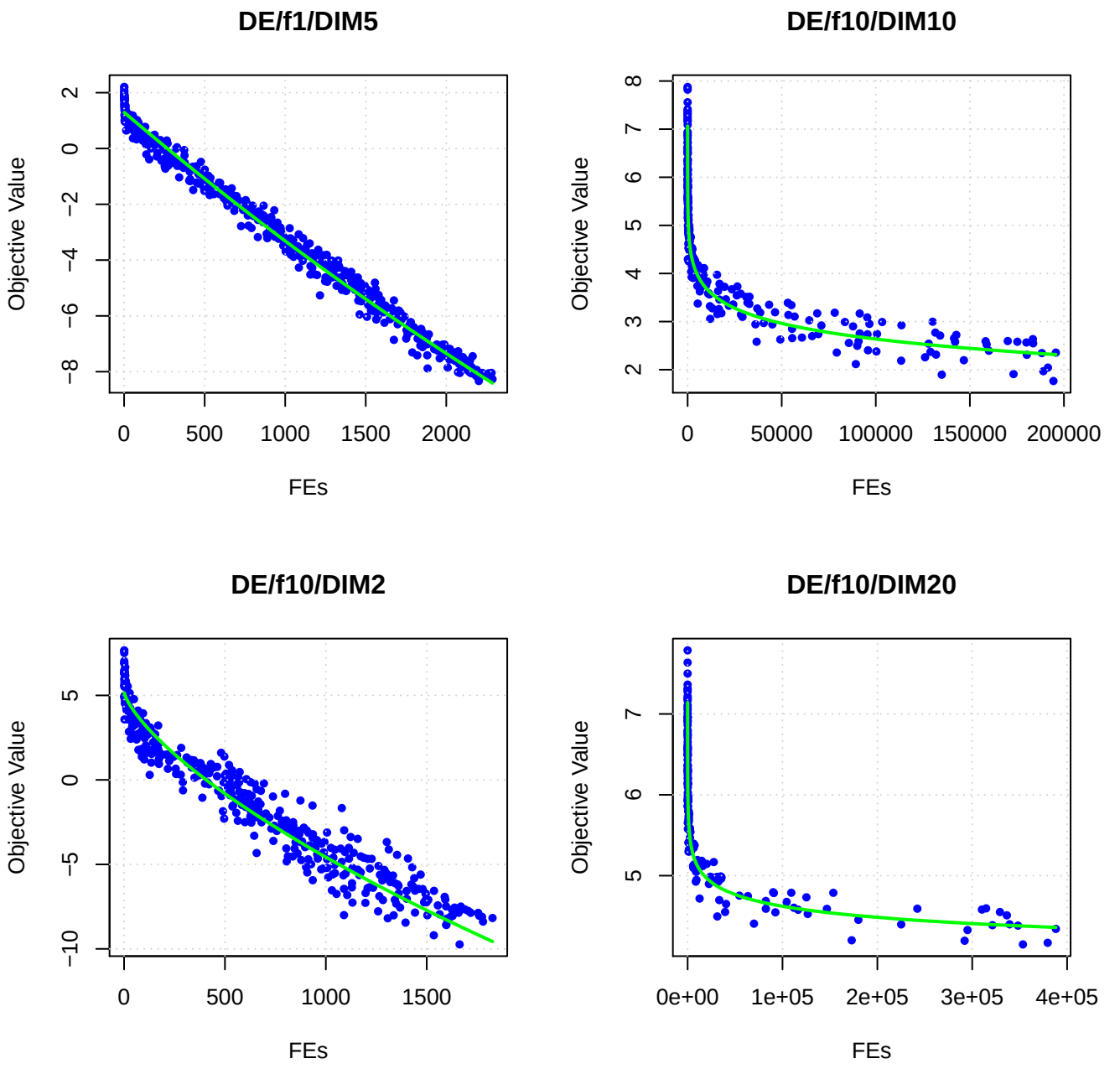
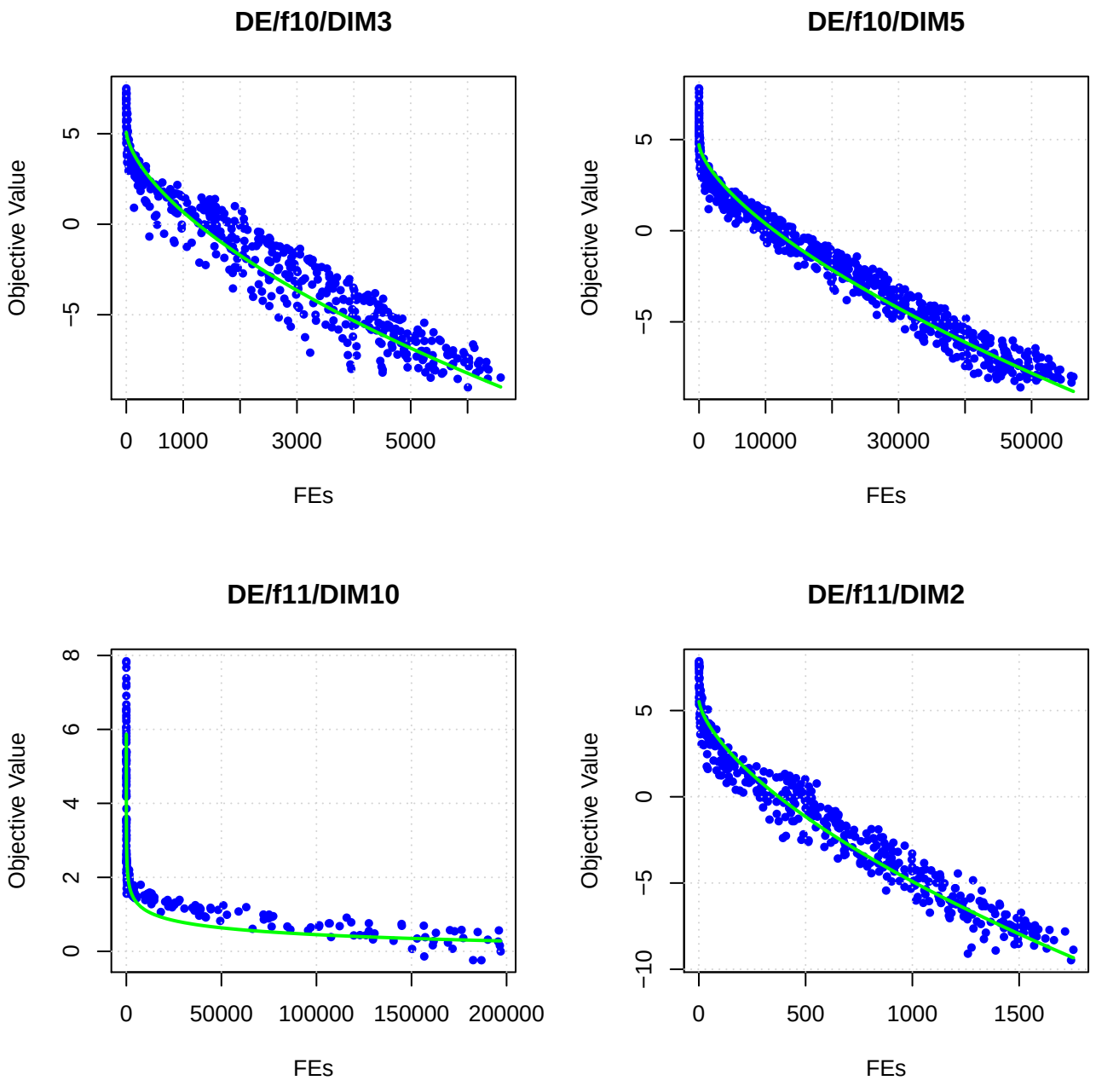
2
3
4
5


DE/f1/DIM10
Objective Value
FEs
DE/f1/DIM2
Objective Value
FEs
DE/f1/DIM20
Objective Value
FEs
DE/f1/DIM3
Objective Value
FEs


DE/f1/DIM5
Objective Value
FEs
DE/f10/DIM10
Objective Value
FEs
DE/f10/DIM2
Objective Value
FEs
DE/f10/DIM20
Objective Value
FEs


DE/f10/DIM3
Objective Value
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0
−5
0
1000
3000
5000
FEs
DE/f10/DIM5
Objective Value
5
0
−5
0
10000
30000
50000
FEs
DE/f11/DIM10
Objective Value
8
6
4
2
0
0
50000
100000
150000
200000
FEs
DE/f11/DIM2
Objective Value
5
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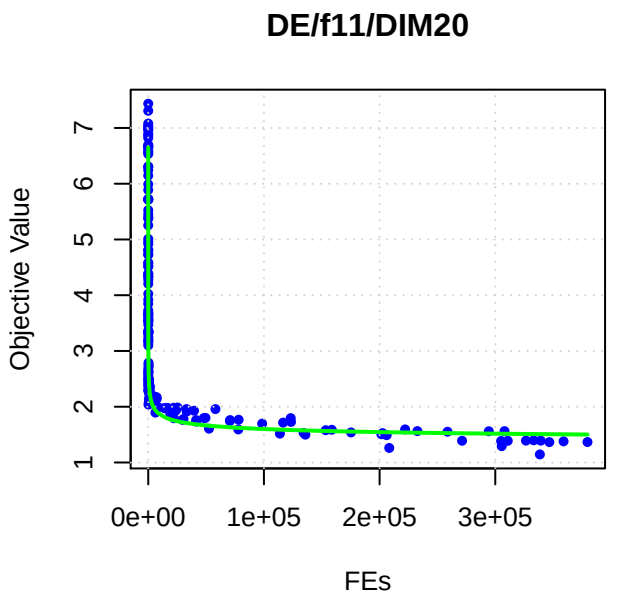
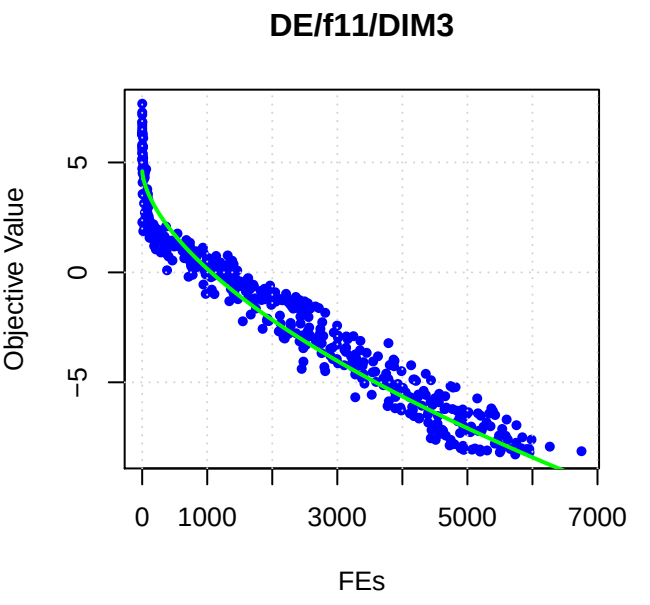
−5
−10
0
500
1000
1500
FEs


DE/f11/DIM20
Objective Value
1
2
3
4
5
6
7
0e+00
1e+05
2e+05
3e+05
FEs


DE/f11/DIM3
Objective Value
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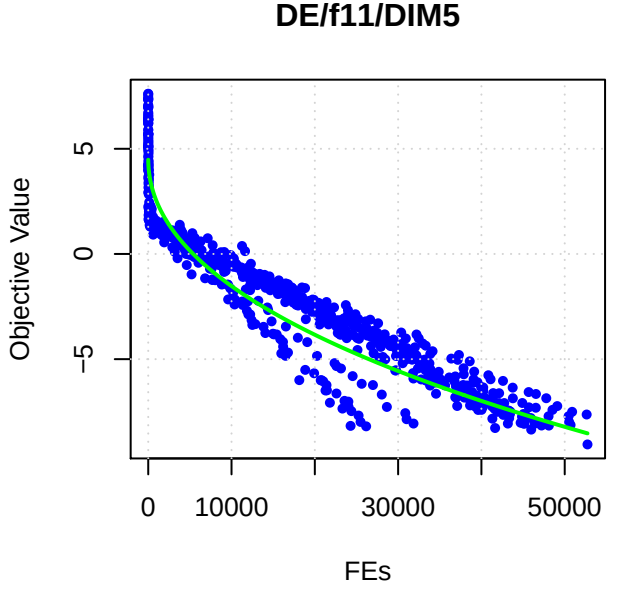
0
5
0
1000
3000
5000
7000
FEs


DE/f11/DIM5
Objective Value
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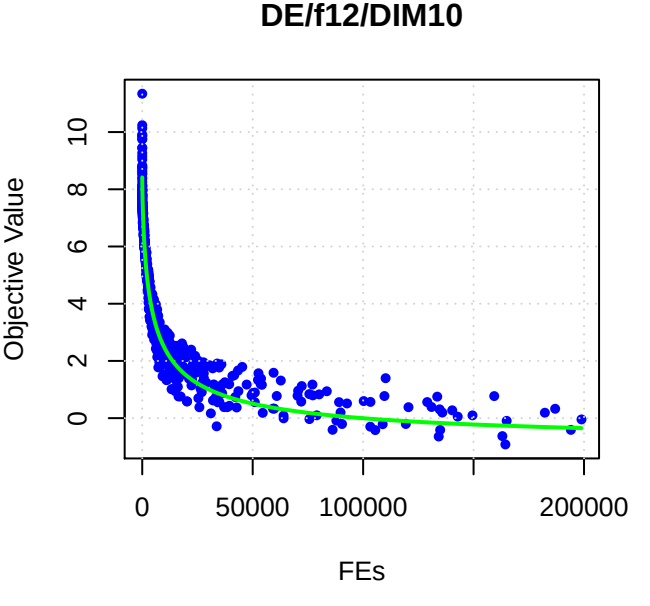
5
0
10000
30000
50000
FEs


DE/f12/DIM10
Objective Value
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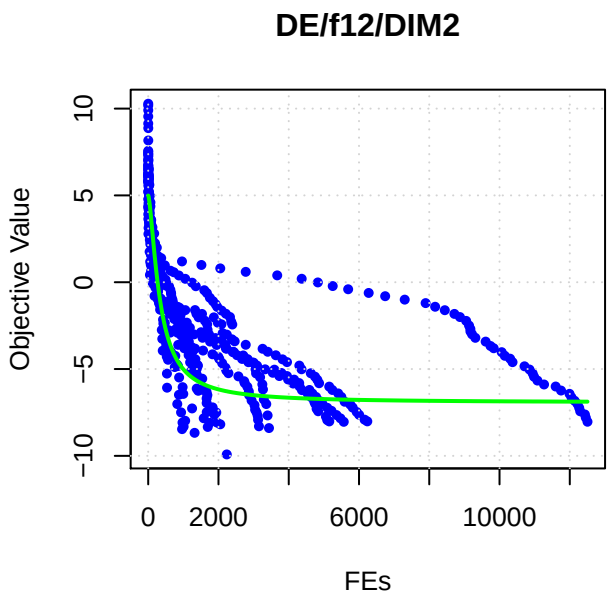
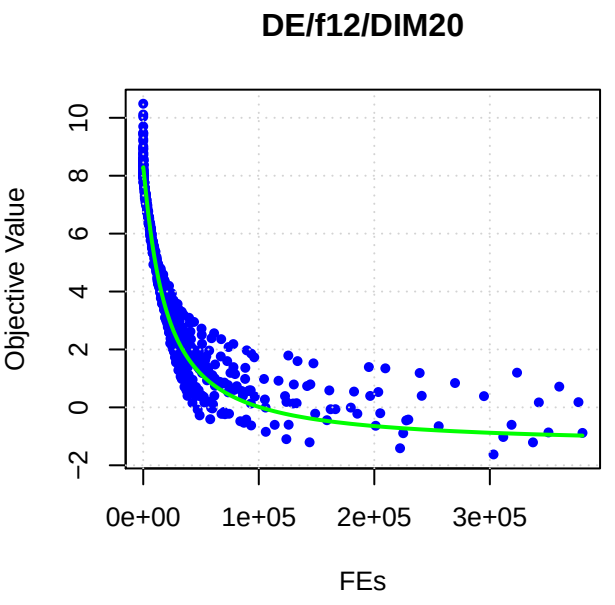
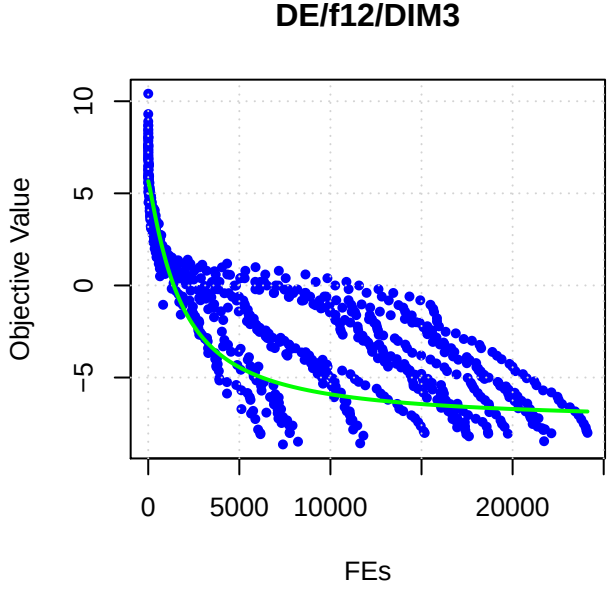
2
4
6
8
10
0
50000
100000
200000
FEs


DE/f12/DIM2
Objective Value
10
5
0
−5
−10
0
2000
6000
10000
FEs


DE/f12/DIM20
Objective Value
10
8
6
4
2
0
−2
0e+00
1e+05
2e+05
3e+05
FEs


DE/f12/DIM3
Objective Value
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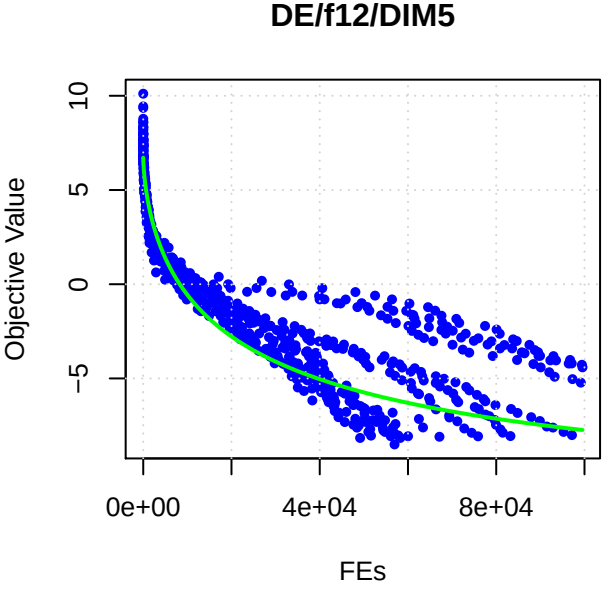
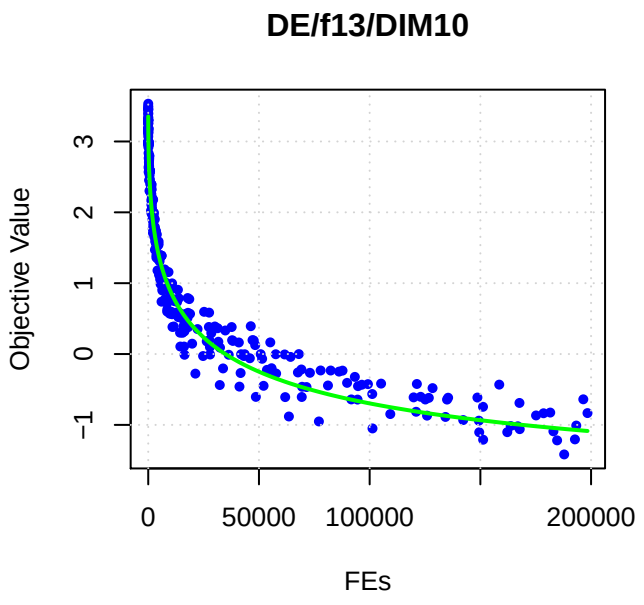
5
0
−5
0
5000
10000
20000
FEs


DE/f12/DIM5
Objective Value
10
5
0
−5
0e+00
4e+04
8e+04
FEs


DE/f13/DIM10
Objective Value
FEs
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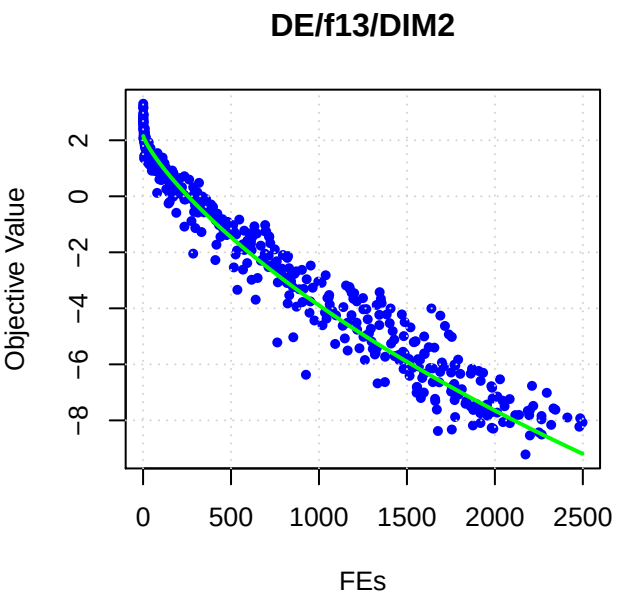
50000
100000
200000
−1
0
1
2
3


DE/f13/DIM2
Objective Value
FEs
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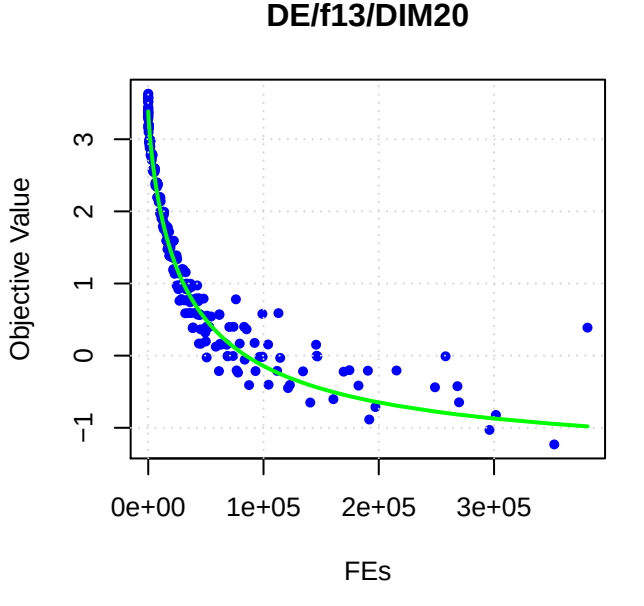
500
1000
1500
2000
2500
−8
−6
−4
−2
0
2


DE/f13/DIM20
Objective Value
FEs
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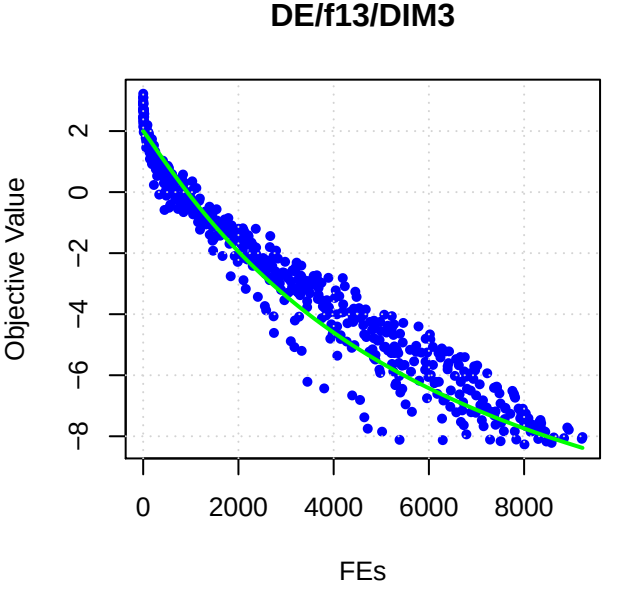
1e+05
2e+05
3e+05
−1
0
1
2
3


DE/f13/DIM3
Objective Value
FEs
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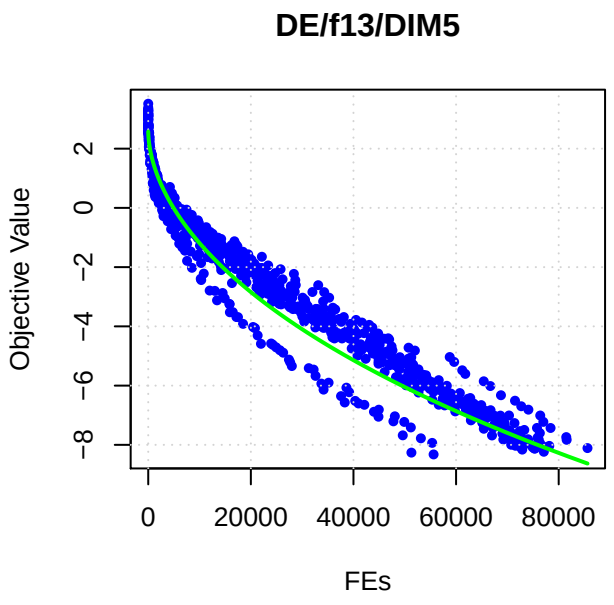
2000
4000
6000
8000
−8
−6
−4
−2
0
2


DE/f13/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
20000
40000
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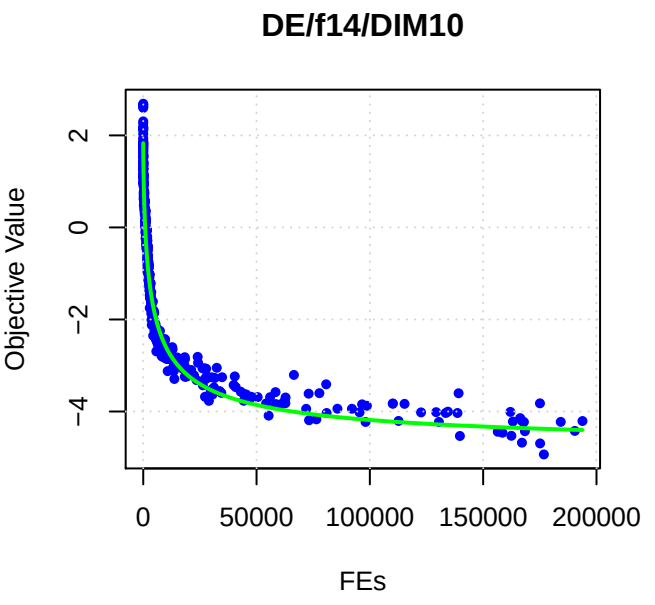
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FEs
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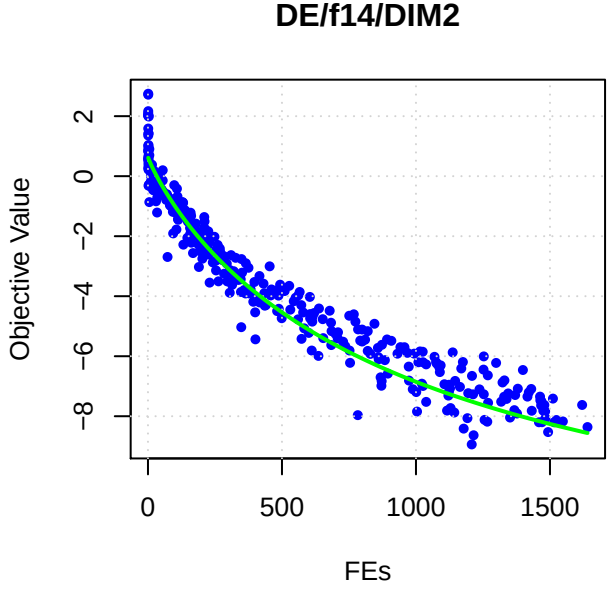
200000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Objective Value
FEs
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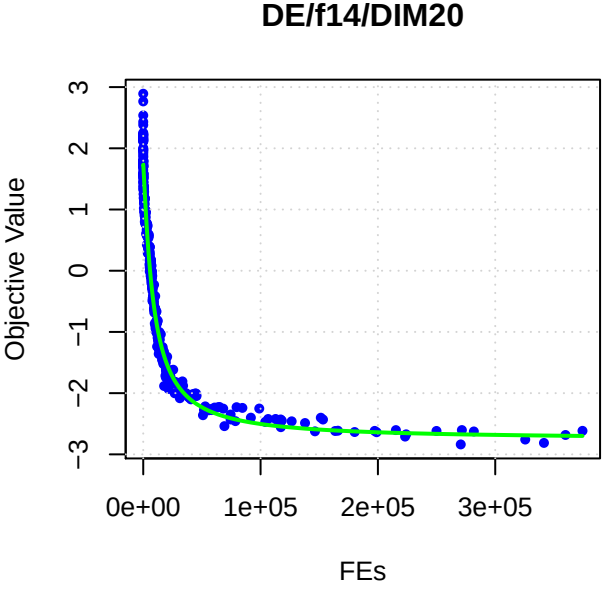
DE/f14/DIM20
Objective Value
FEs
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−1
−2
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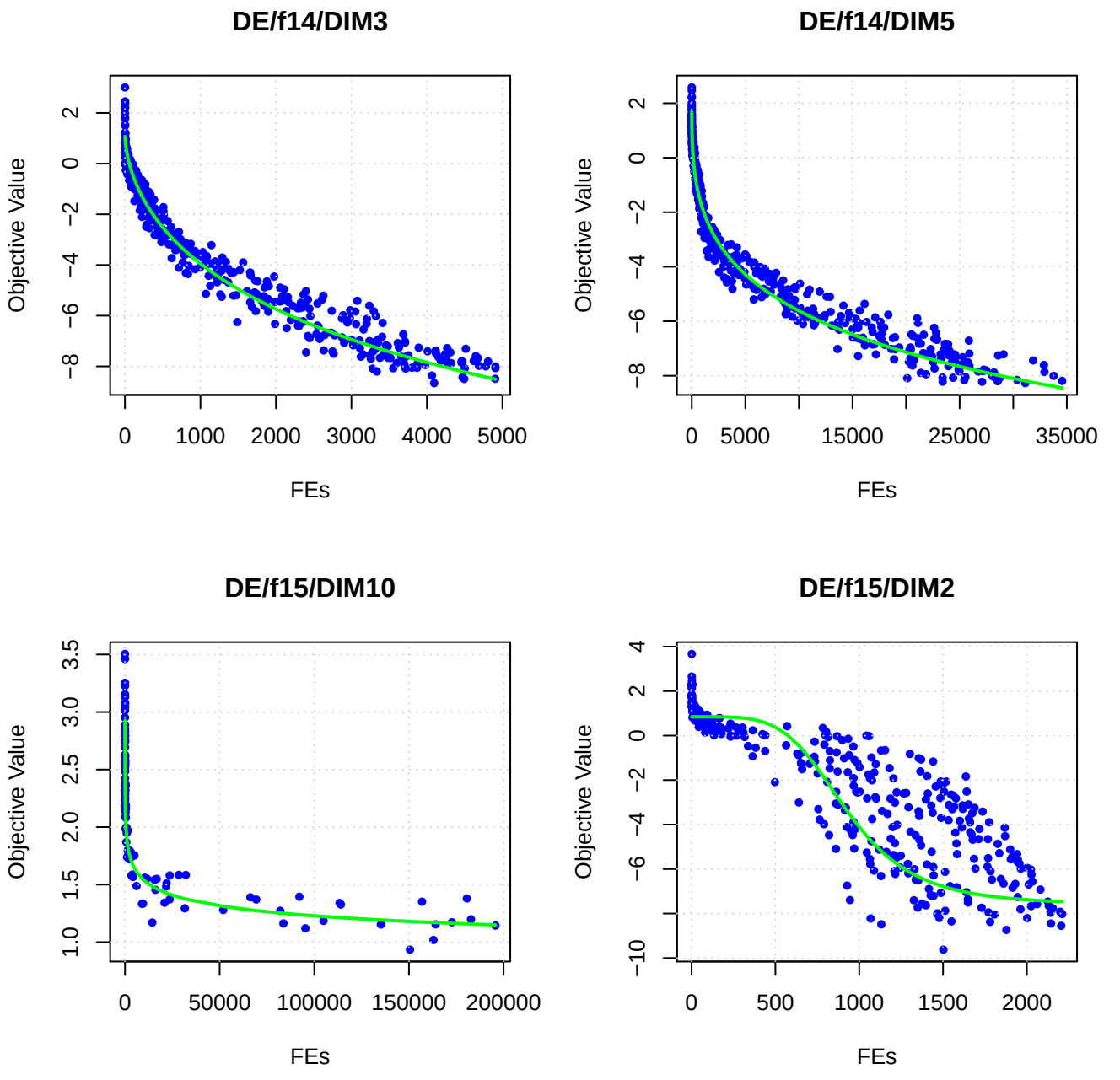
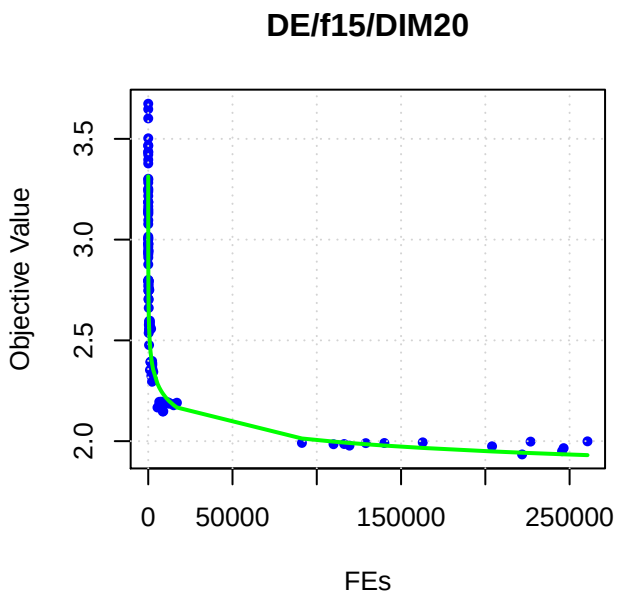
2e+05
3e+05


DE/f14/DIM3
Objective Value
FEs
DE/f14/DIM5
Objective Value
FEs
DE/f15/DIM10
Objective Value
FEs
DE/f15/DIM2
Objective Value
FEs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Objective Value
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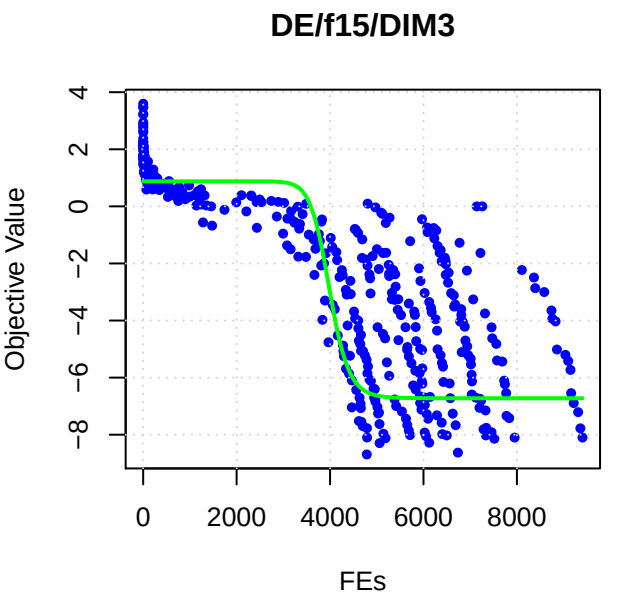
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Objective Value
FEs
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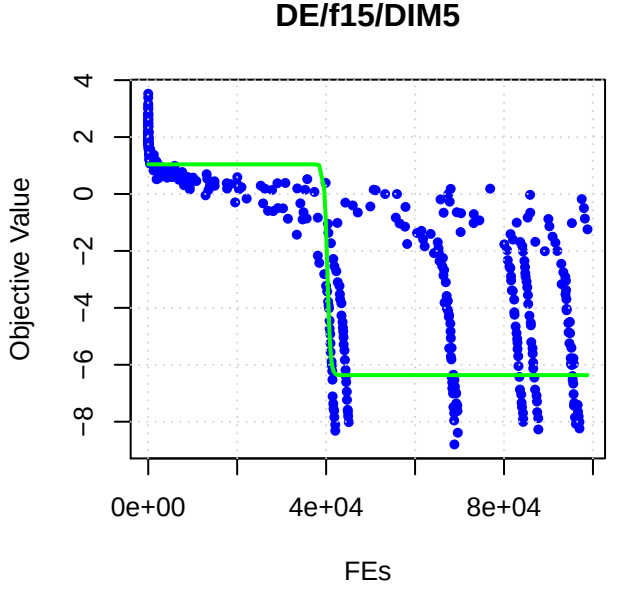
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FEs
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−6
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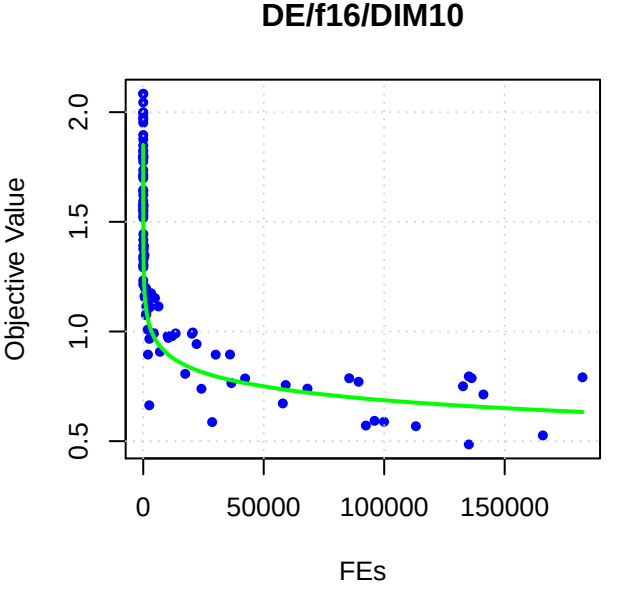
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1.5
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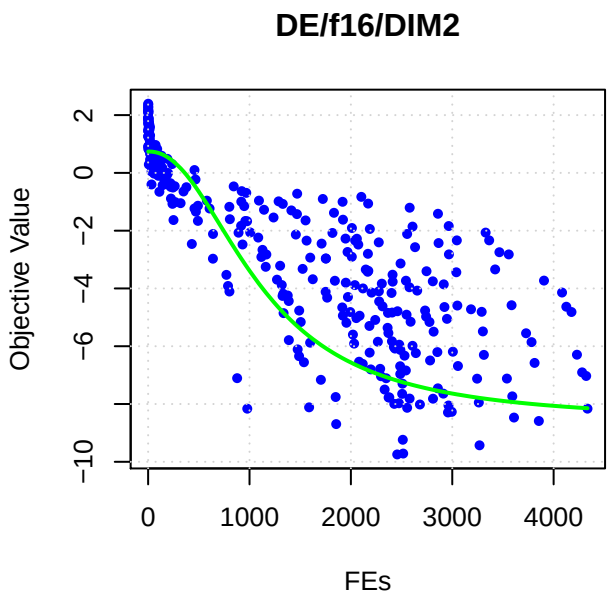
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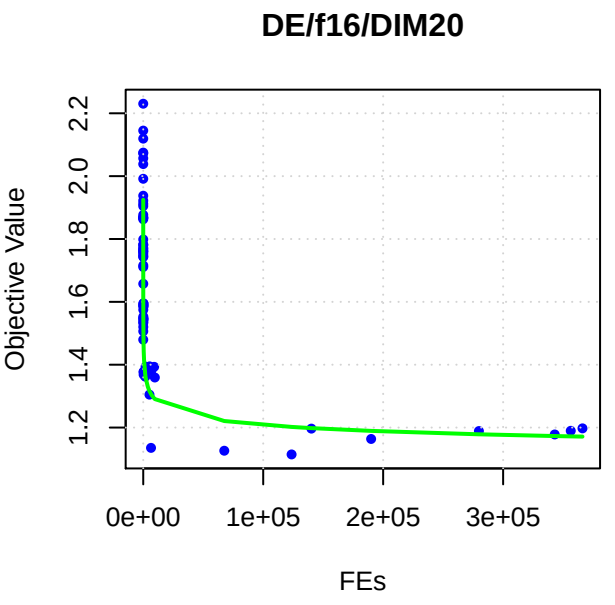
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Objective Value
FEs
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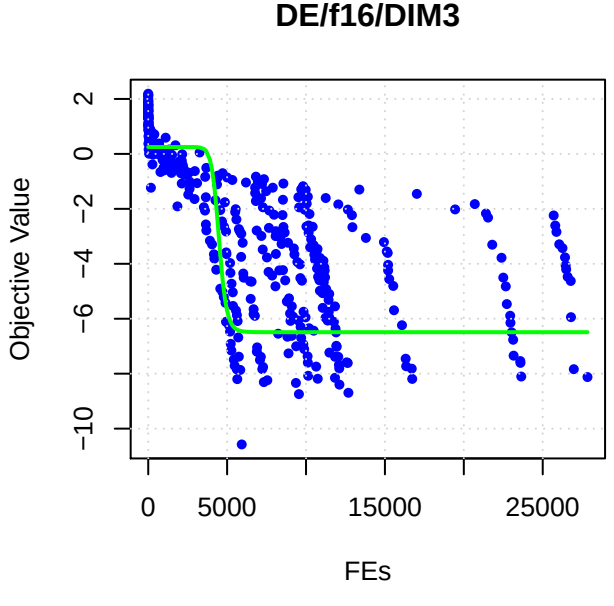
2e+05
3e+05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Objective Value
FEs
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−6
−10
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15000
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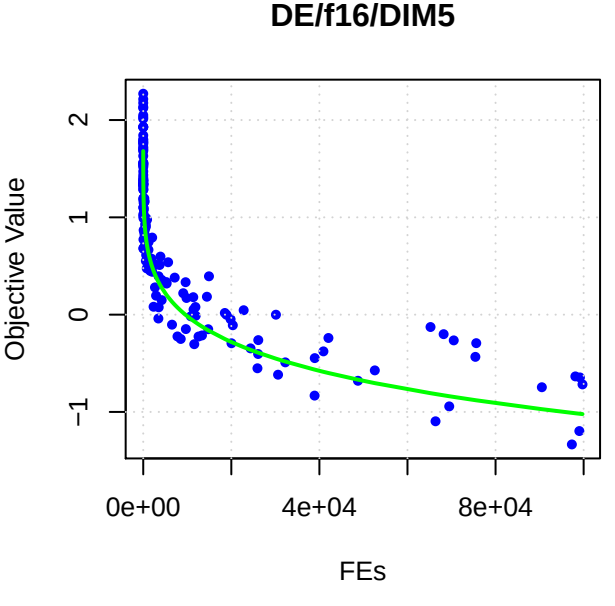
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Objective Value
FEs
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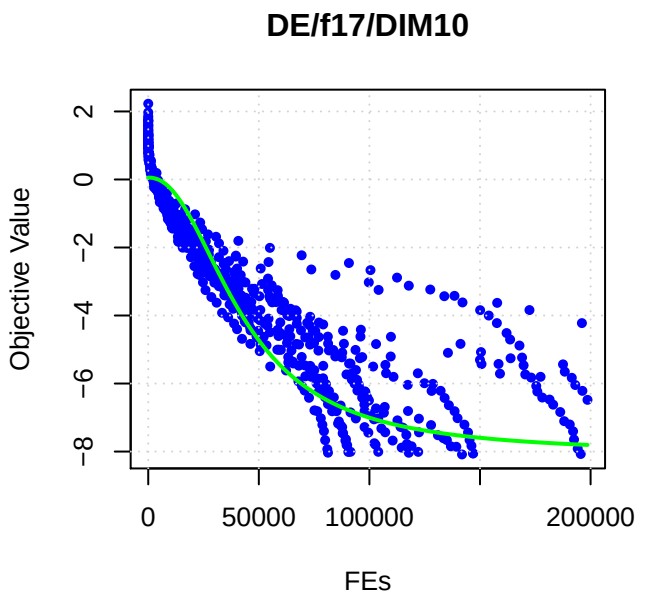
8e+04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Objective Value
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100000
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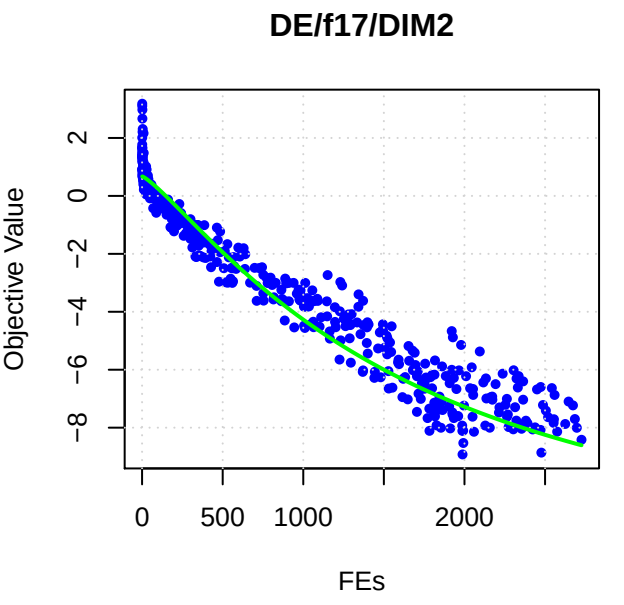
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Objective Value
FEs
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−6
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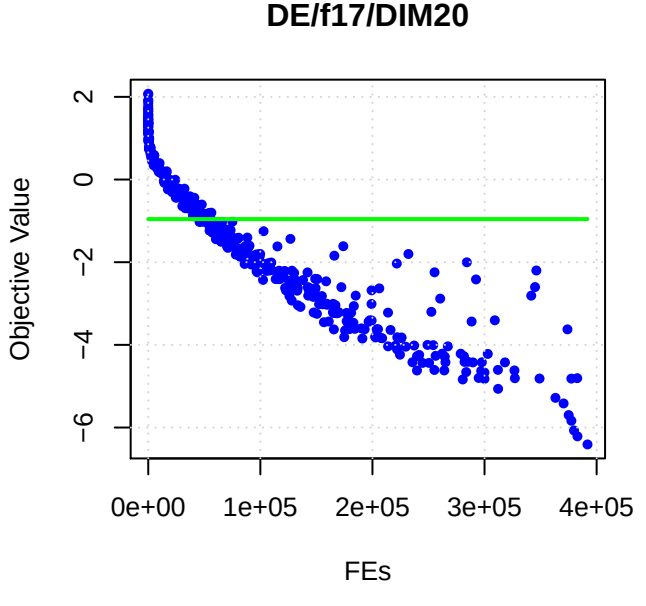
DE/f17/DIM20
Objective Value
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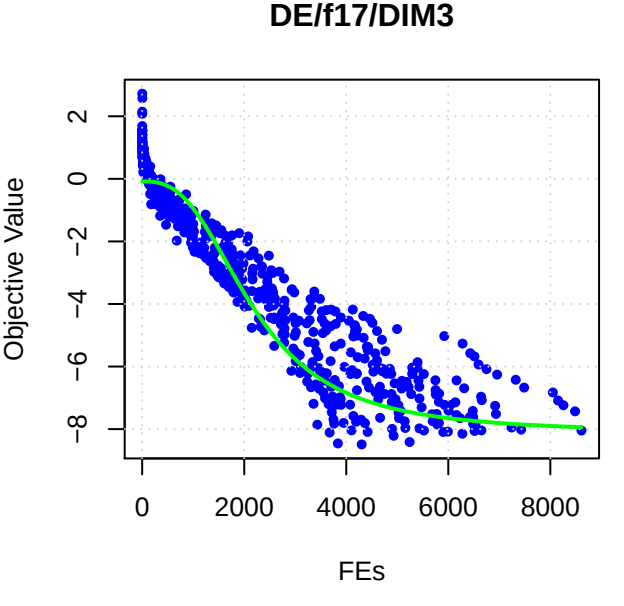
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Objective Value
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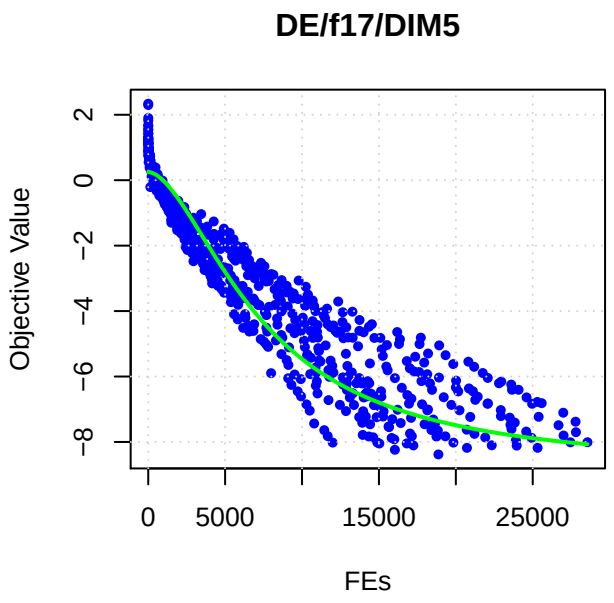
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Objective Value
FEs
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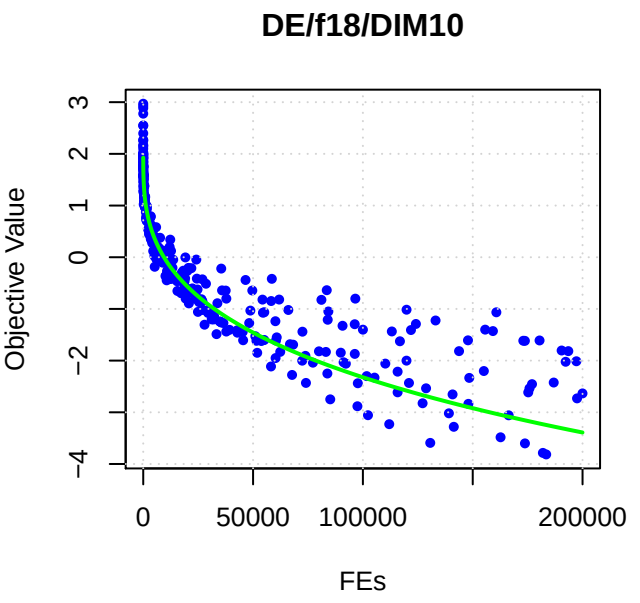
15000
25000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FEs
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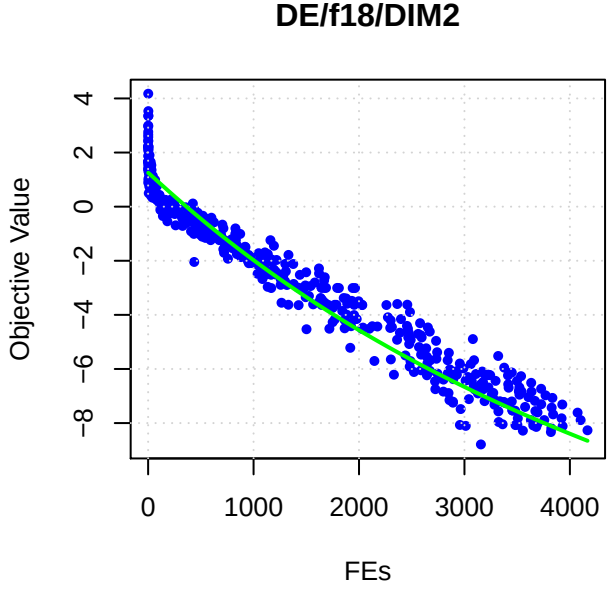
100000
200000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Objective Value
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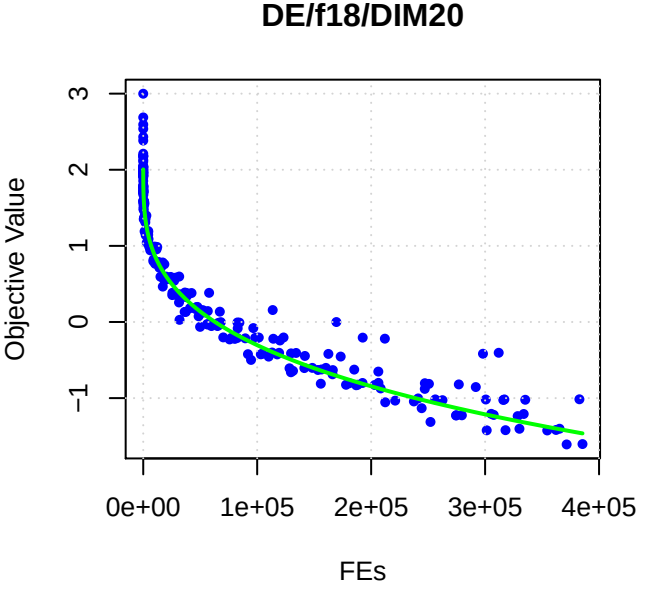
DE/f18/DIM20
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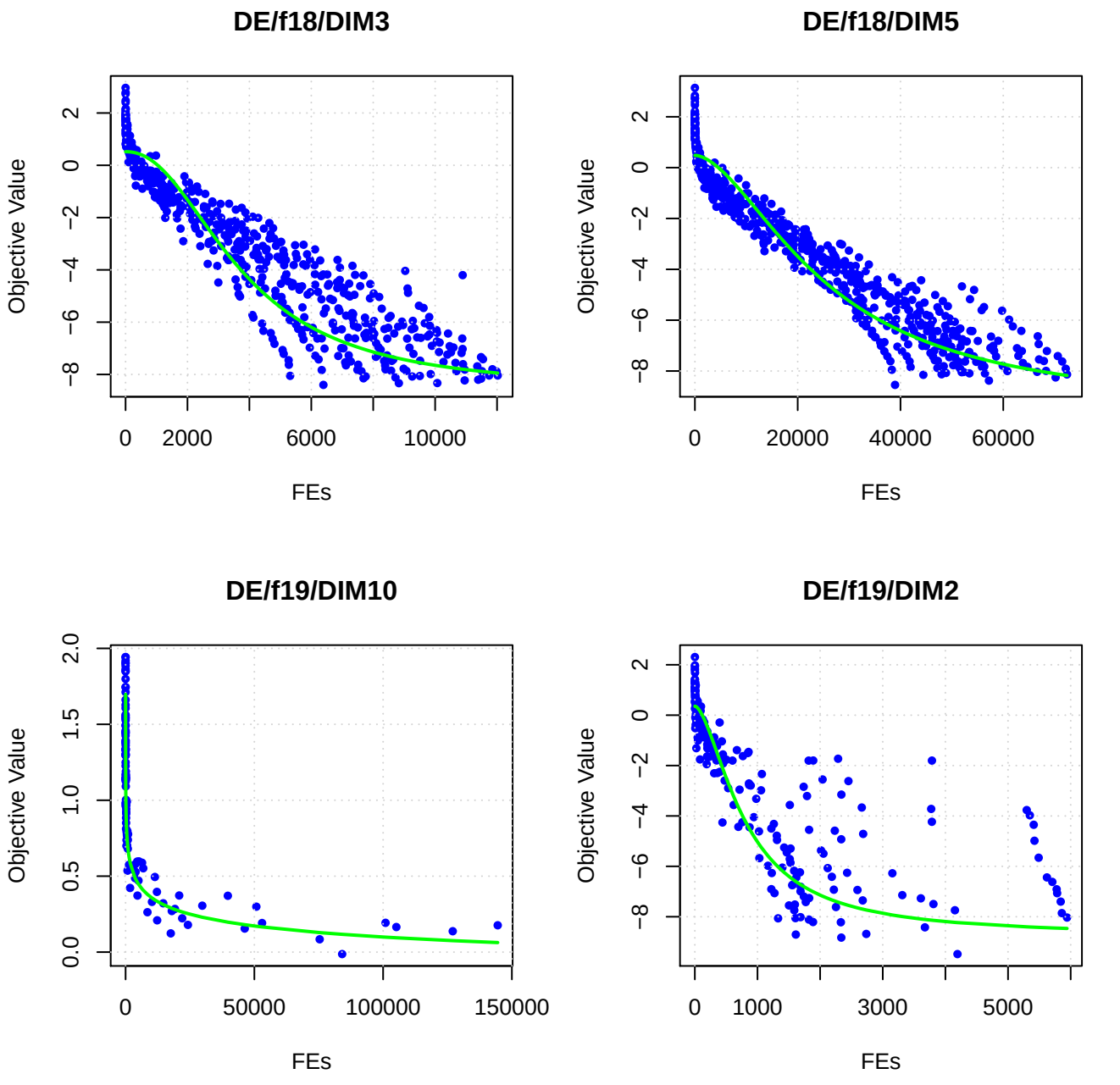
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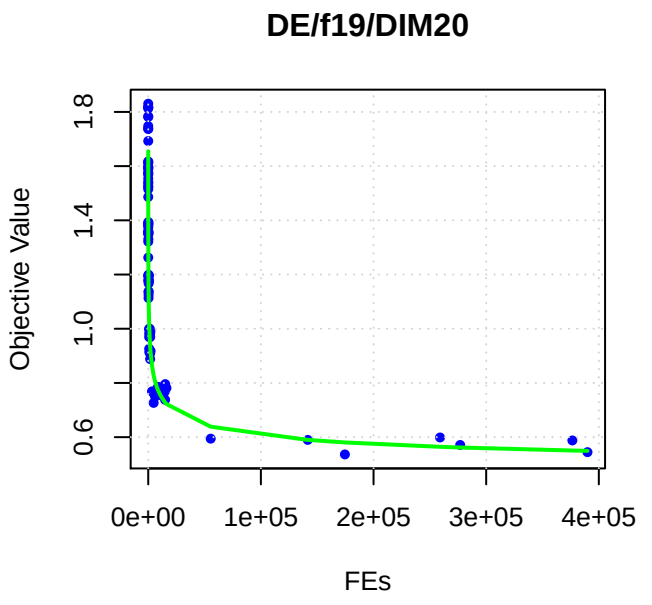
FEs
DE/f19/DIM10
Objective Value
FEs
DE/f19/DIM2
Objective Value
FEs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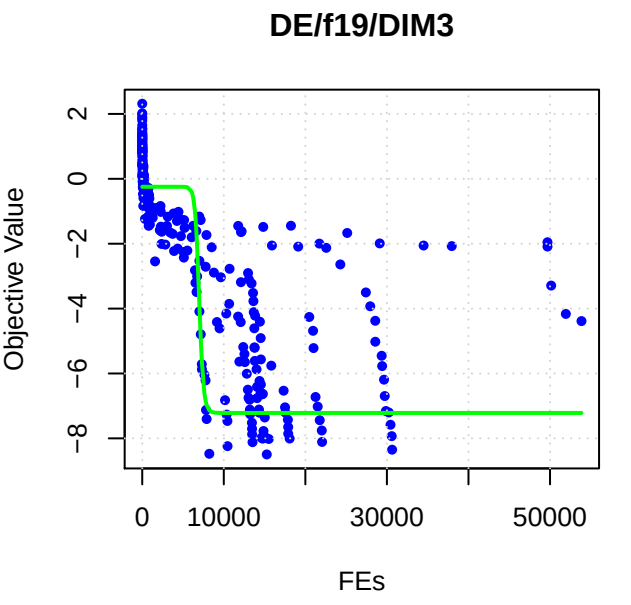
4e+05
FEs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Objective Value
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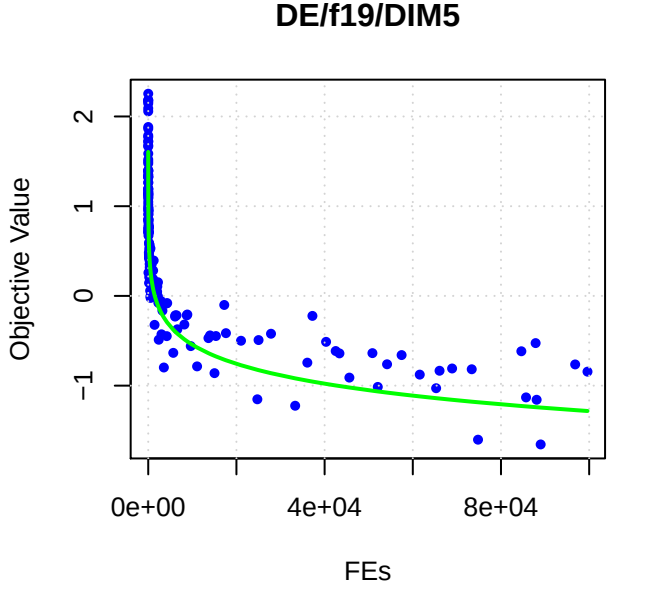
30000
50000
FEs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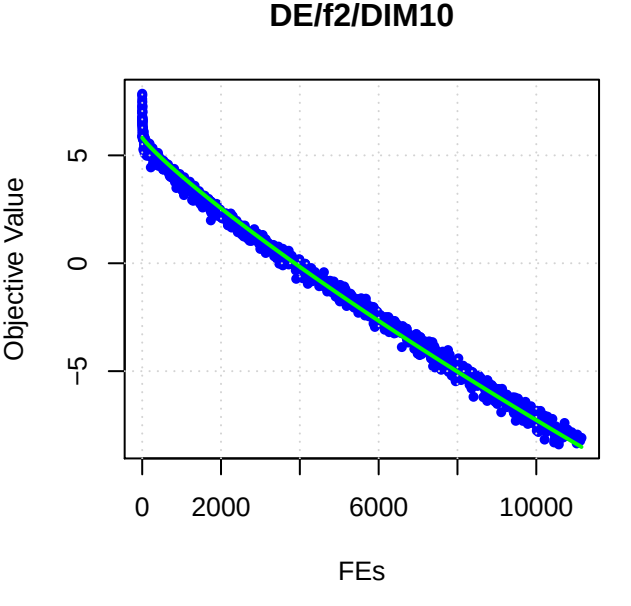
FEs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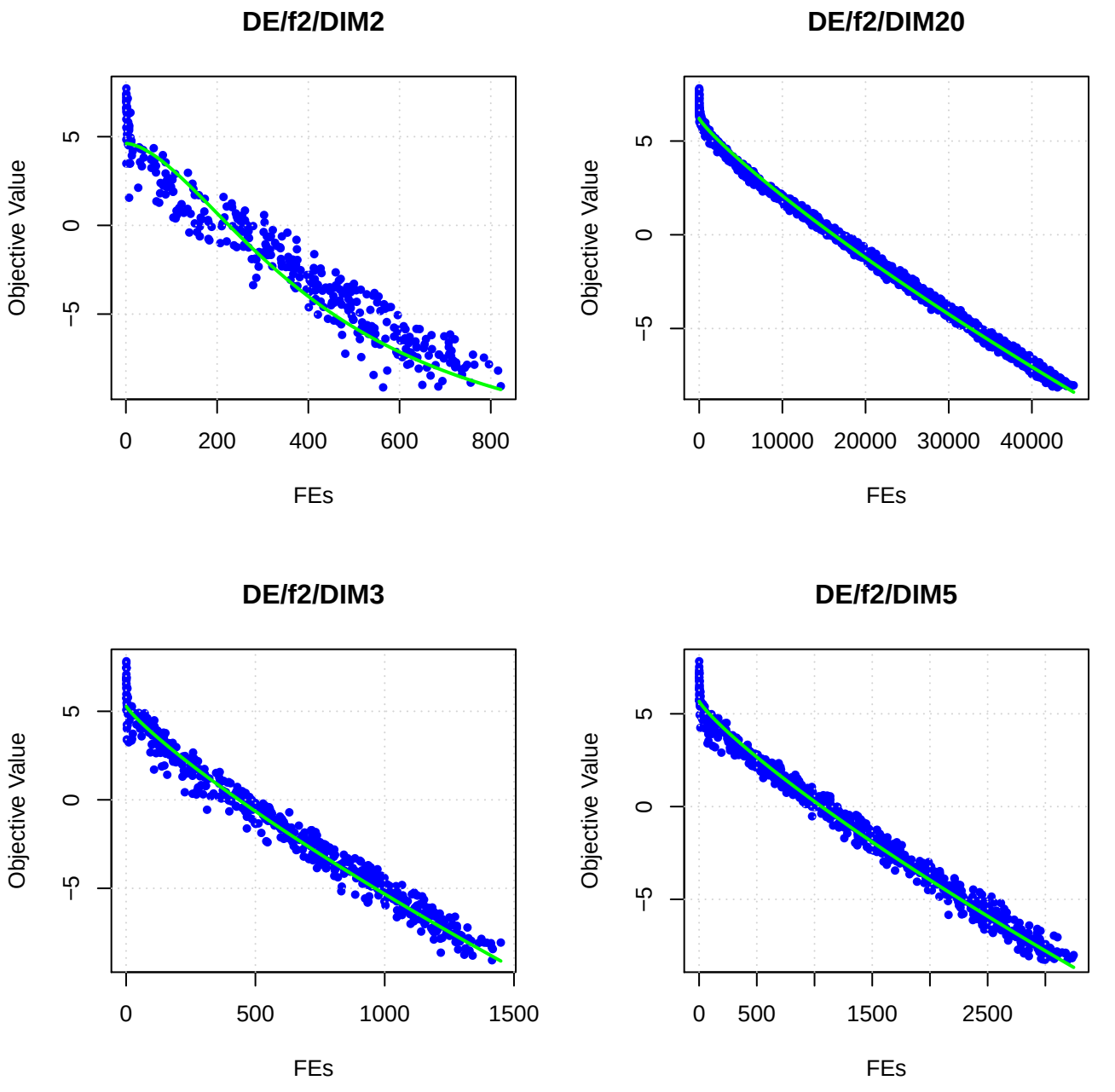
6000
10000
FEs


DE/f2/DIM2
DE/f2/DIM20
DE/f2/DIM3
DE/f2/DIM5
Objective Value
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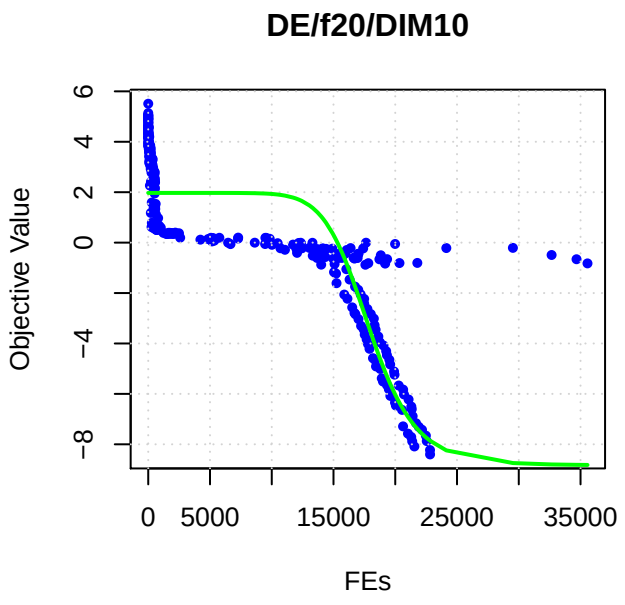
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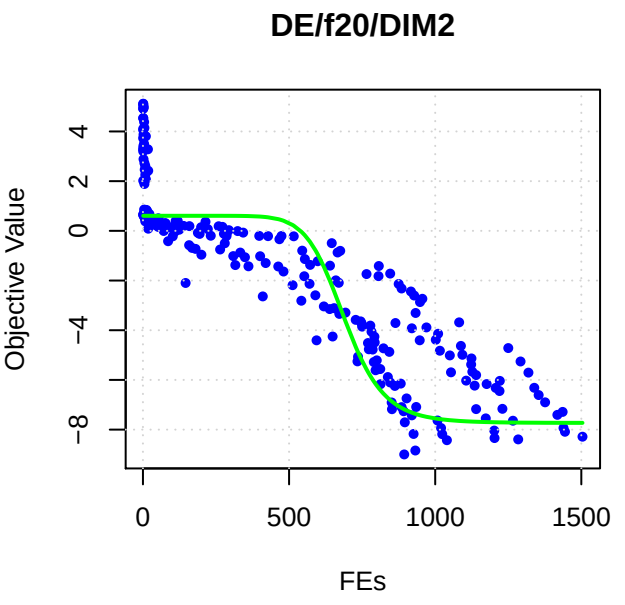
DE/f20/DIM2
Objective Value
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1000
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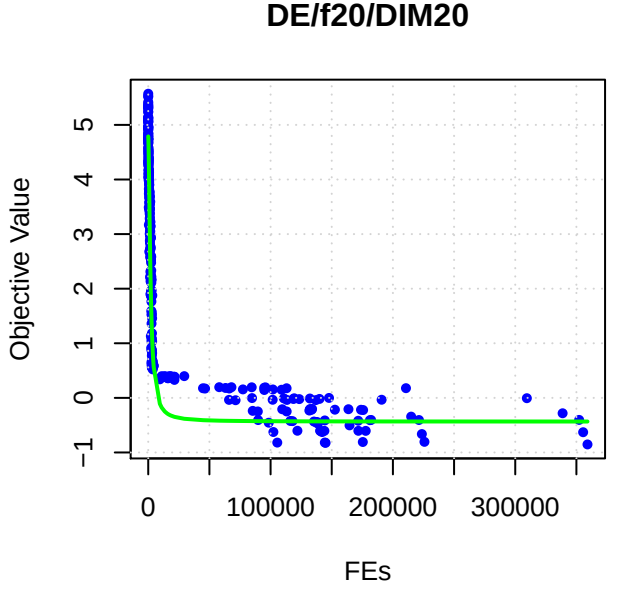
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Objective Value
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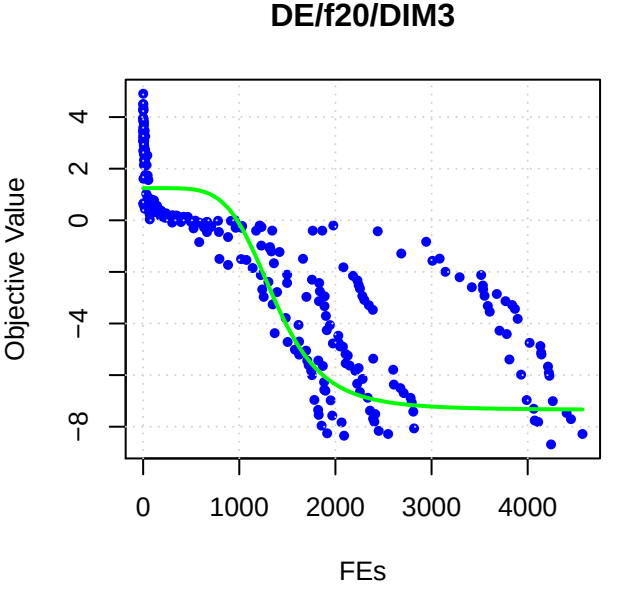
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Objective Value
FEs
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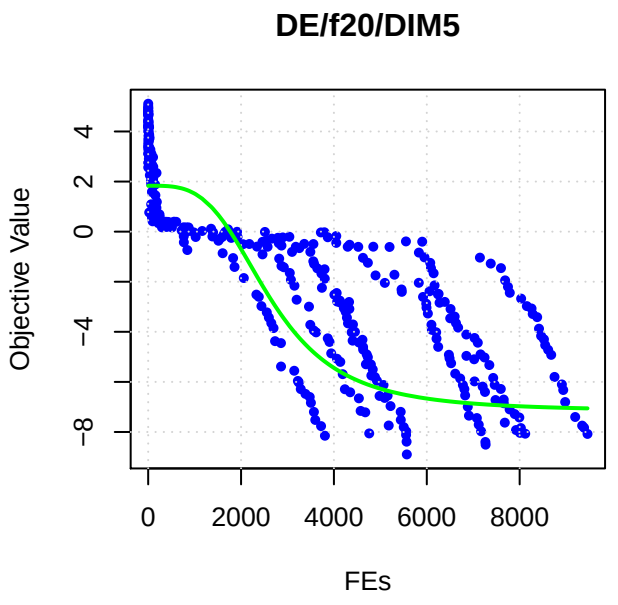
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Objective Value
FEs
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6000
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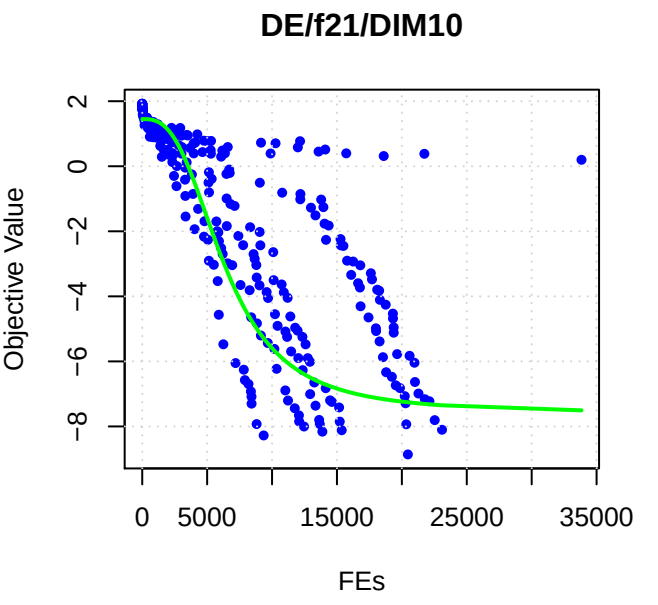
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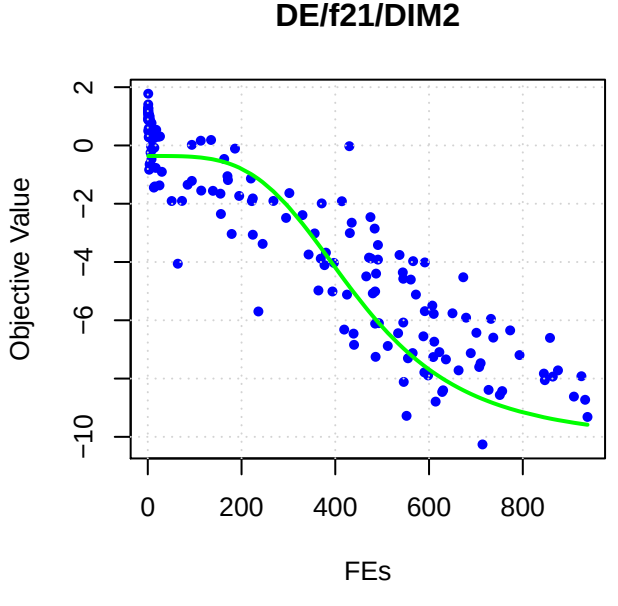
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Objective Value
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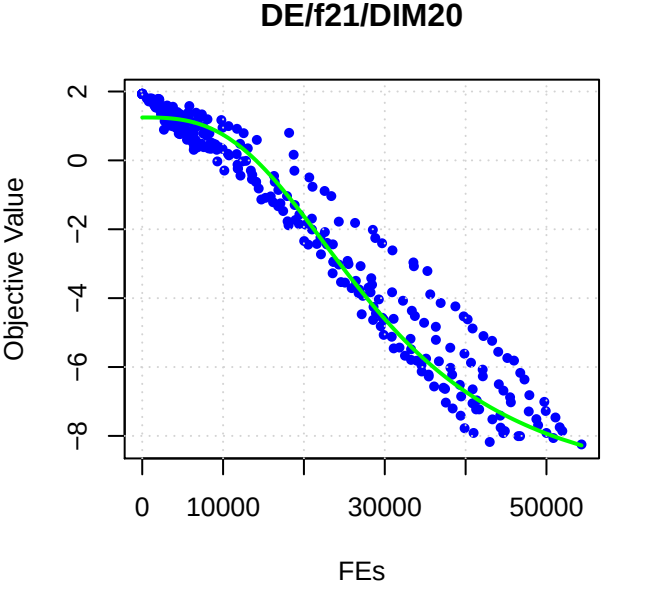
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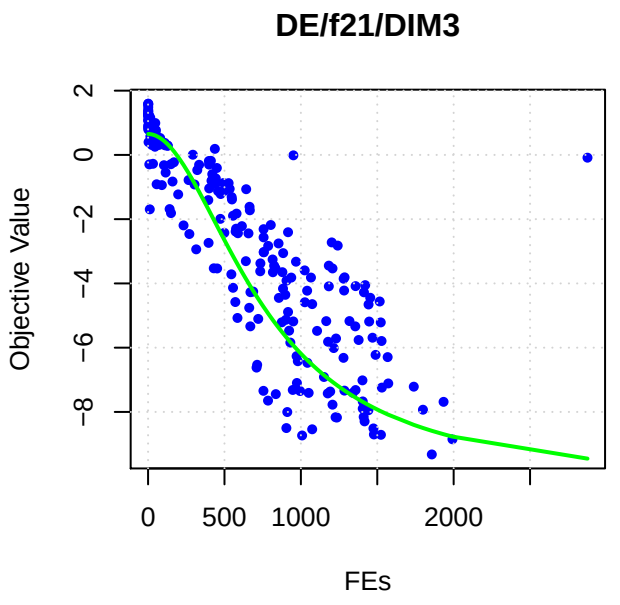
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Objective Value
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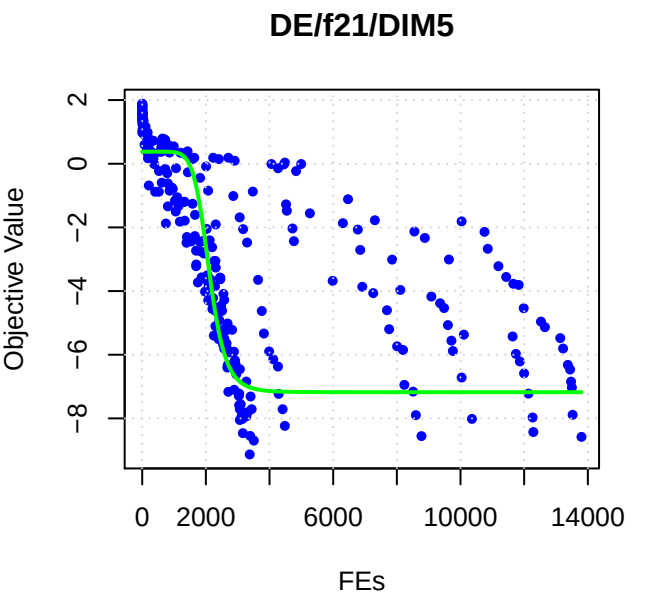
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Objective Value
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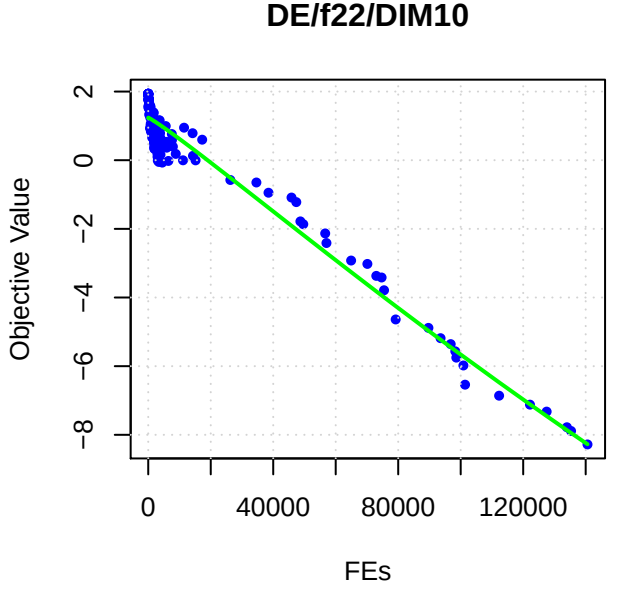
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Objective Value
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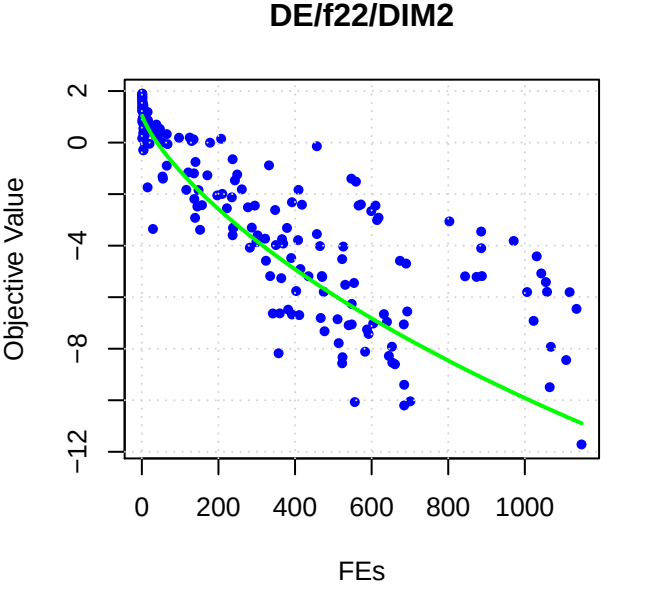
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Objective Value
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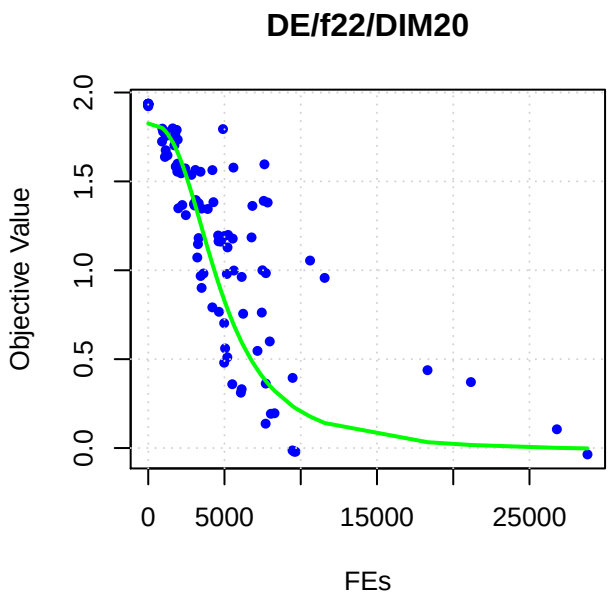
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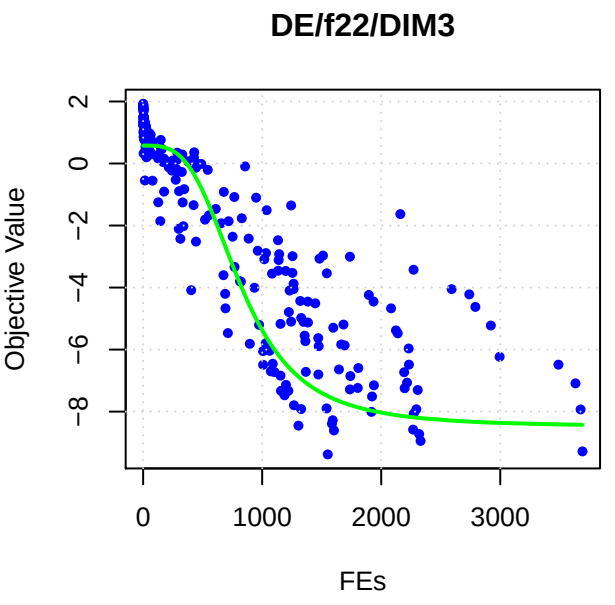
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Objective Value
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−8
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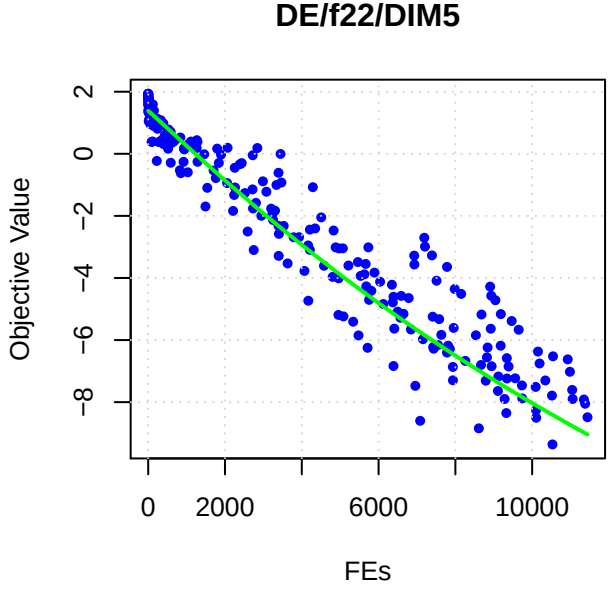
2000
3000


DE/f22/DIM5
Objective Value
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−4
−6
−8
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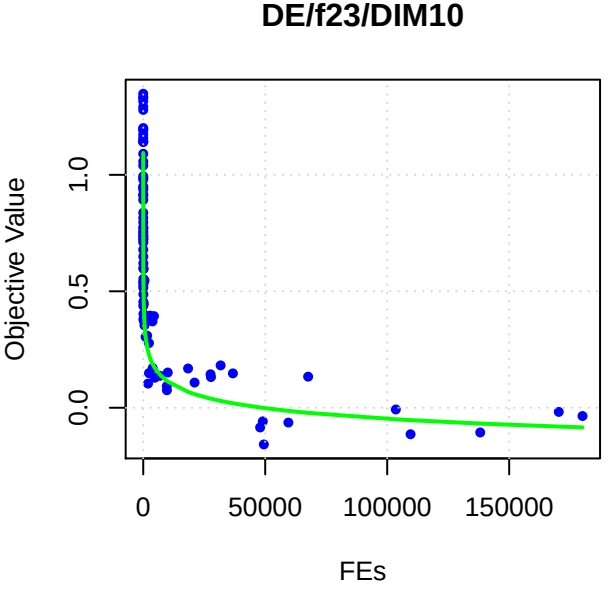
6000
10000


DE/f23/DIM10
Objective Value
FEs
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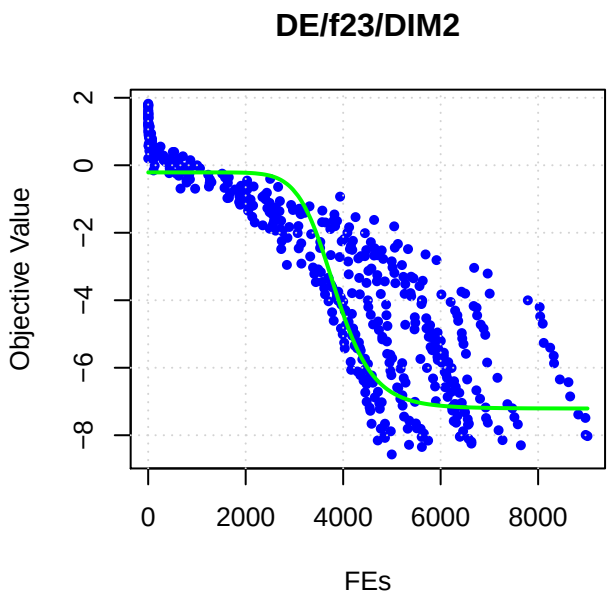
0.5
1.0
0
50000
100000
150000


DE/f23/DIM2
Objective Value
FEs
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0
−2
−4
−6
−8
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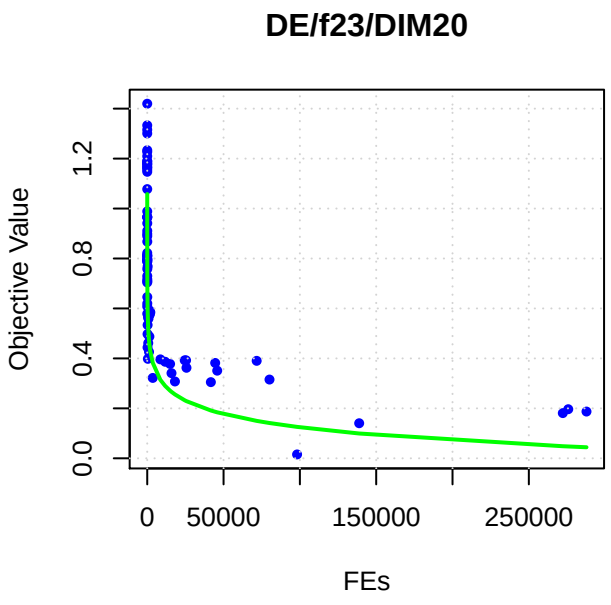
2000
4000
6000
8000


DE/f23/DIM20
Objective Value
FEs
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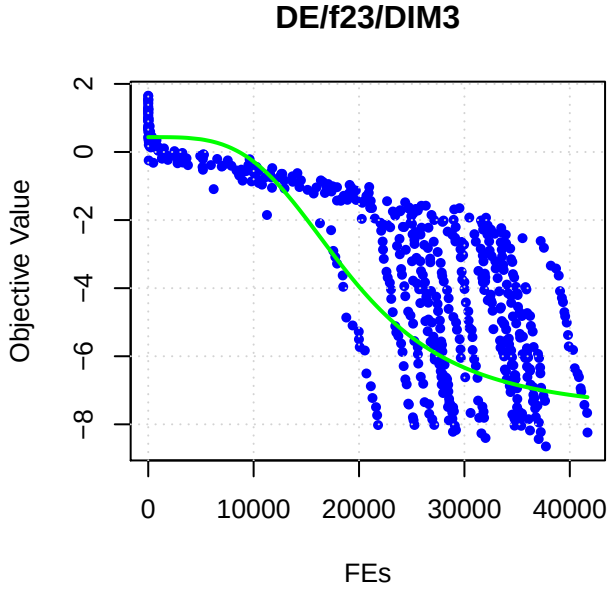
0.8
0.4
0.0
0
50000
150000
250000


DE/f23/DIM3
Objective Value
FEs
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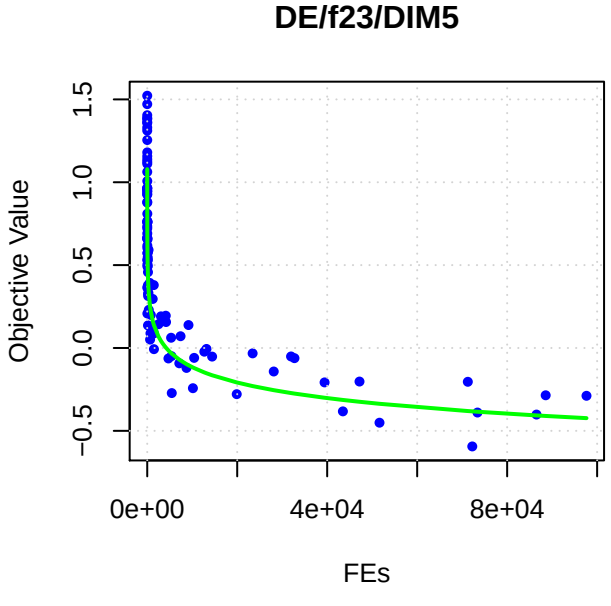
−2
−4
−6
−8
0
10000
20000
30000
40000


DE/f23/DIM5
Objective Value
FEs
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0.5
0.0
−0.5
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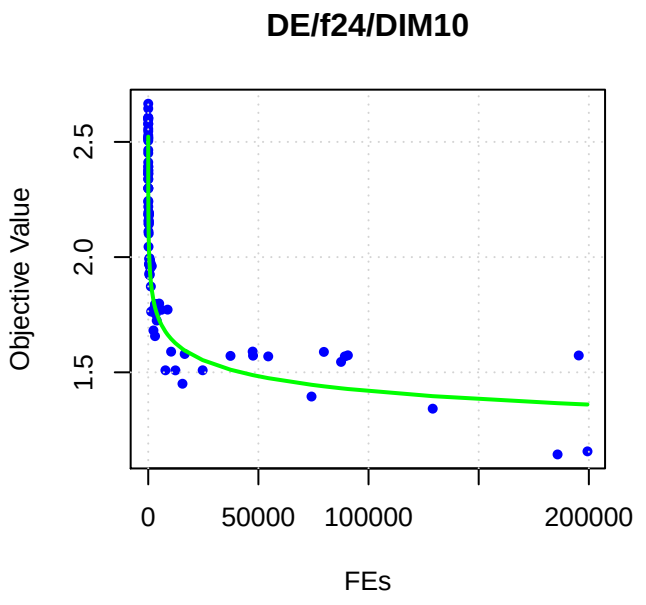
4e+04
8e+04


DE/f24/DIM10
Objective Value
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2.0
1.5
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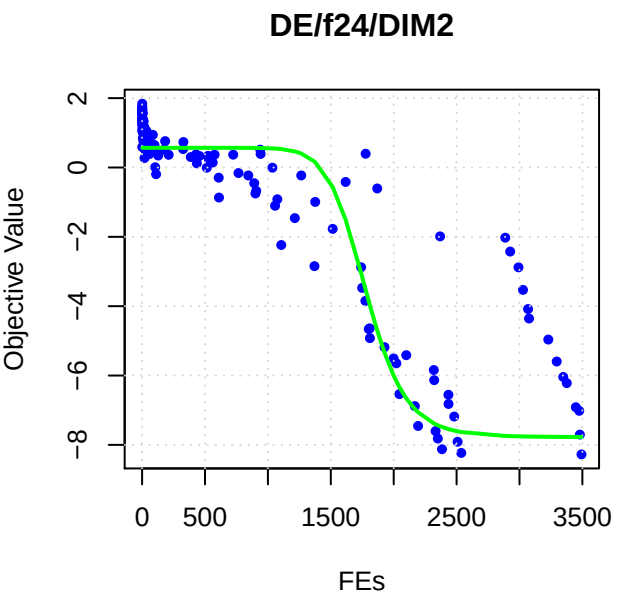
100000
200000
FEs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Objective Value
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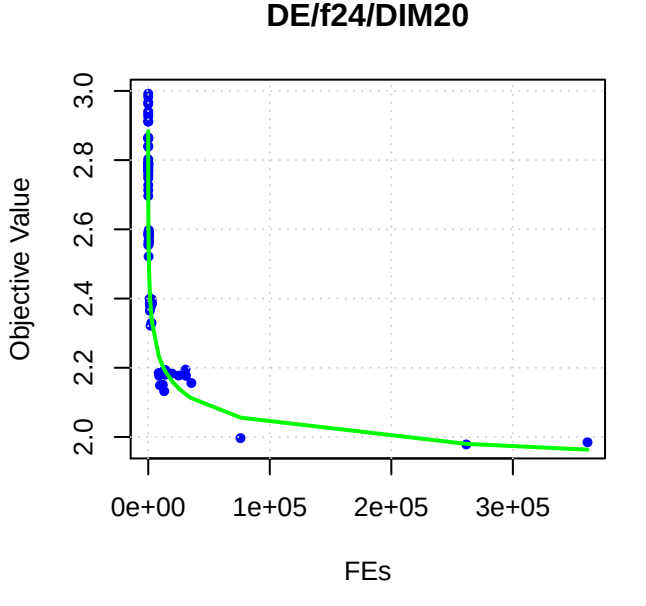
1500
2500
3500
FEs


DE/f24/DIM20
Objective Value
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2.6
2.4
2.2
2.0
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1e+05
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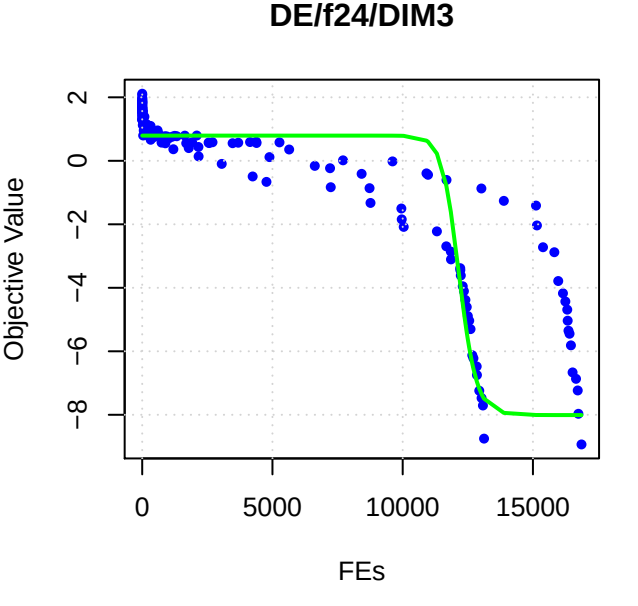
3e+05
FEs


DE/f24/DIM3
Objective Value
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−6
−8
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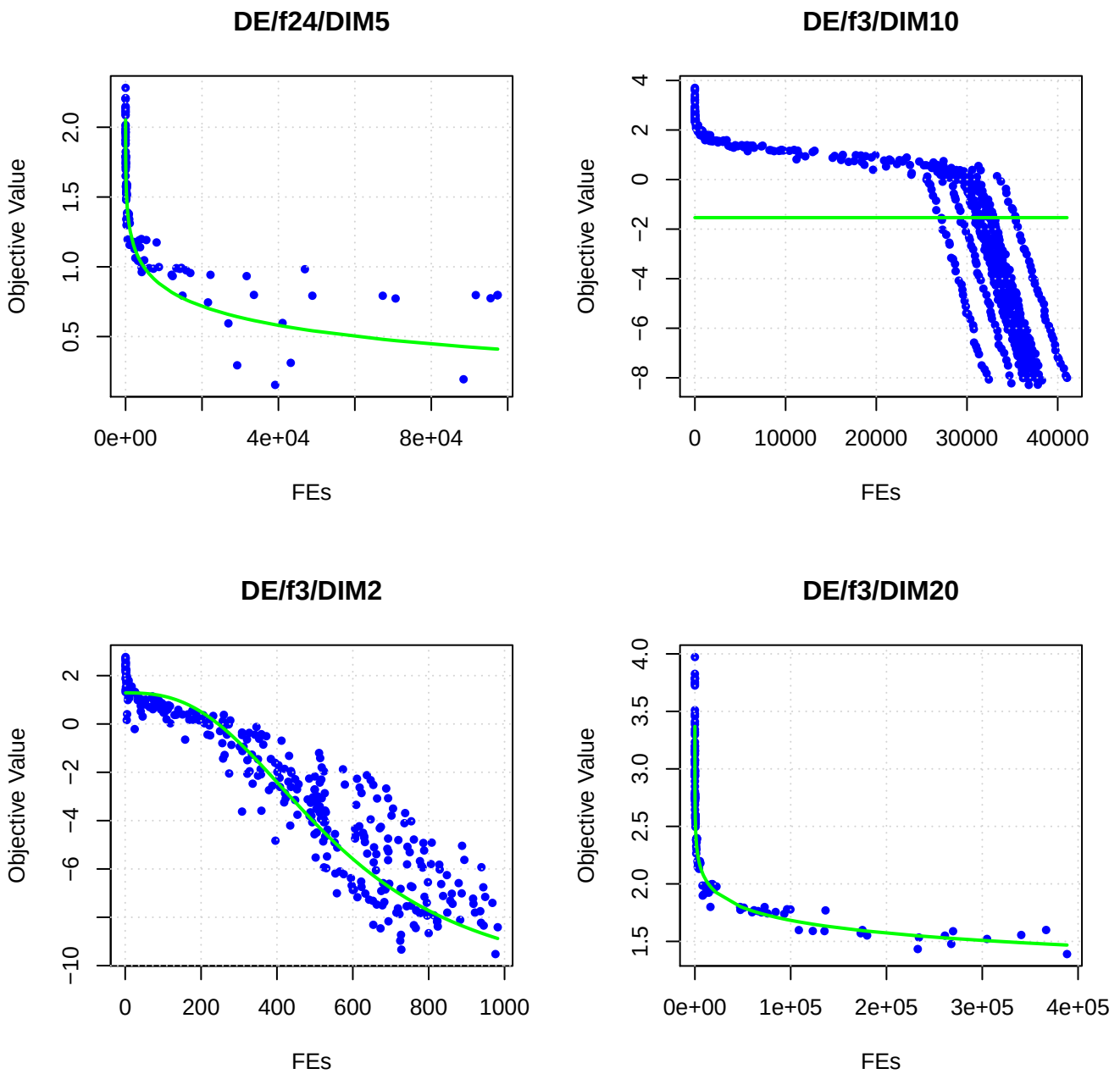
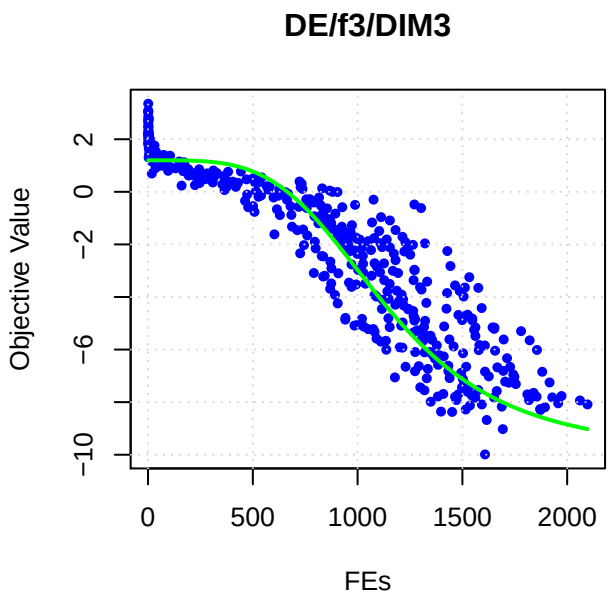
5000
10000
15000
FEs


DE/f24/DIM5
Objective Value
0.5
1.0
1.5
2.0
0e+00
4e+04
8e+04
FEs
DE/f3/DIM10
Objective Value
4
2
0
−2
−4
−6
−8
0
10000
20000
30000
40000
FEs
DE/f3/DIM2
Objective Value
2
0
−2
−4
−6
−10
0
200
400
600
800
1000
FEs
DE/f3/DIM20
Objective Value
1.5
2.0
2.5
3.0
3.5
4.0
0e+00
1e+05
2e+05
3e+05
4e+05
FEs


DE/f3/DIM3
Objective Value
FEs
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−6
−10
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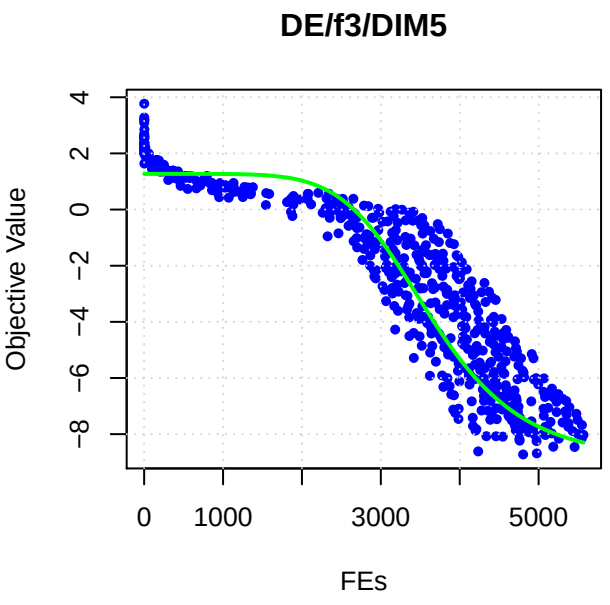
1000
1500
2000


DE/f3/DIM5
Objective Value
FEs
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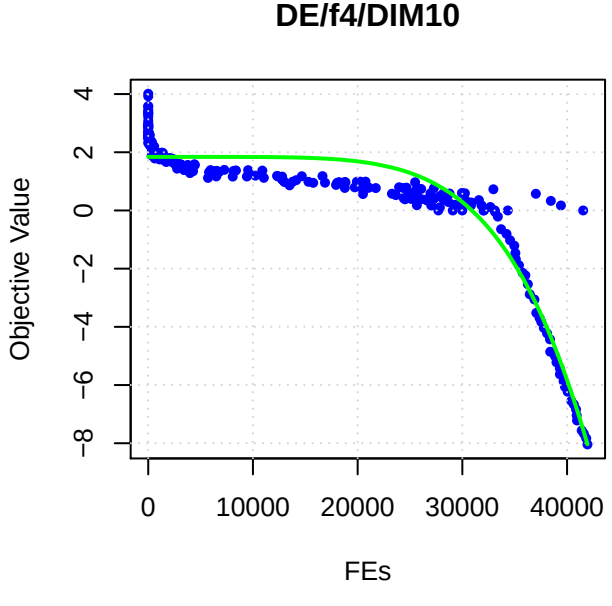
−4
−6
−8
0
1000
3000
5000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Objective Value
FEs
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−8
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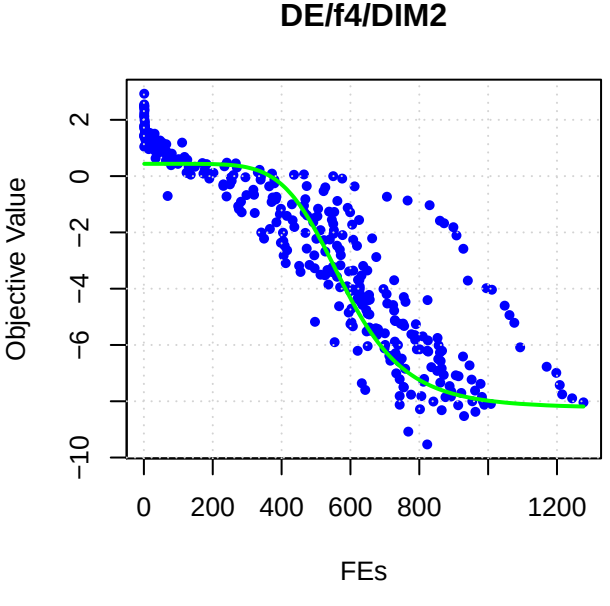
30000
40000


DE/f4/DIM2
Objective Value
FEs
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−6
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400
600
800
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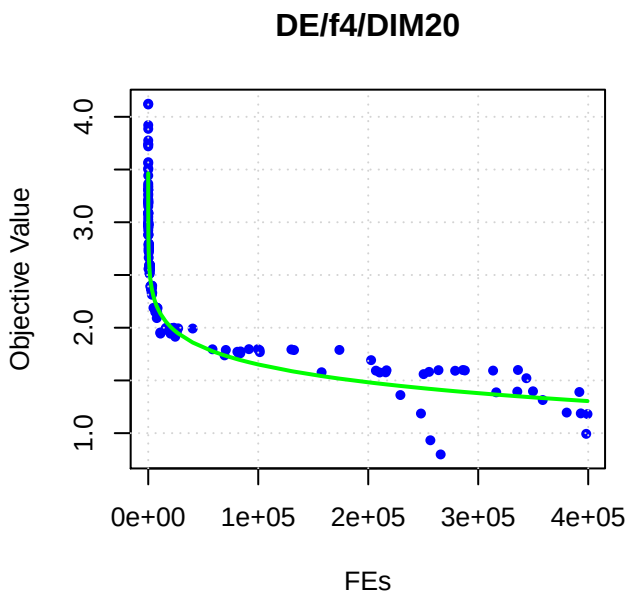
DE/f4/DIM20
Objective Value
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2.0
1.0
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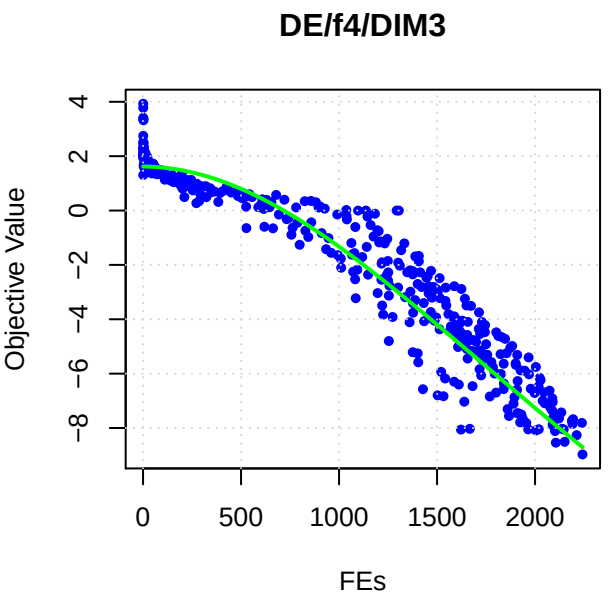
2e+05
3e+05
4e+05
FEs


DE/f4/DIM3
Objective Value
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−4
−6
−8
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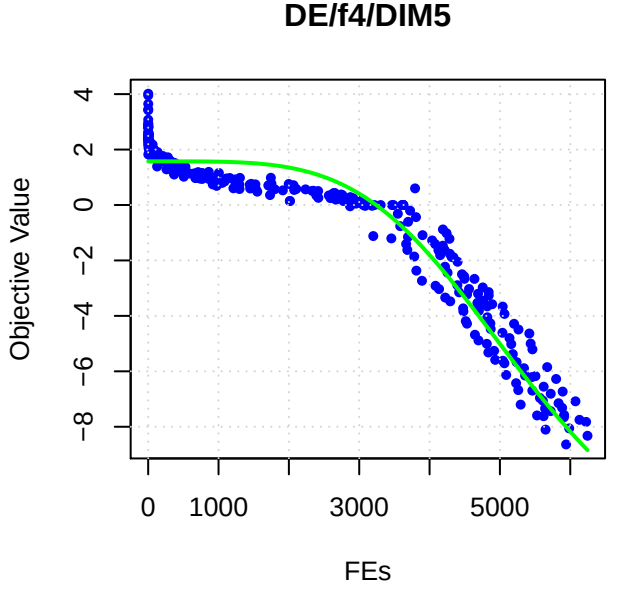
1000
1500
2000
FEs


DE/f4/DIM5
Objective Value
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−2
−4
−6
−8
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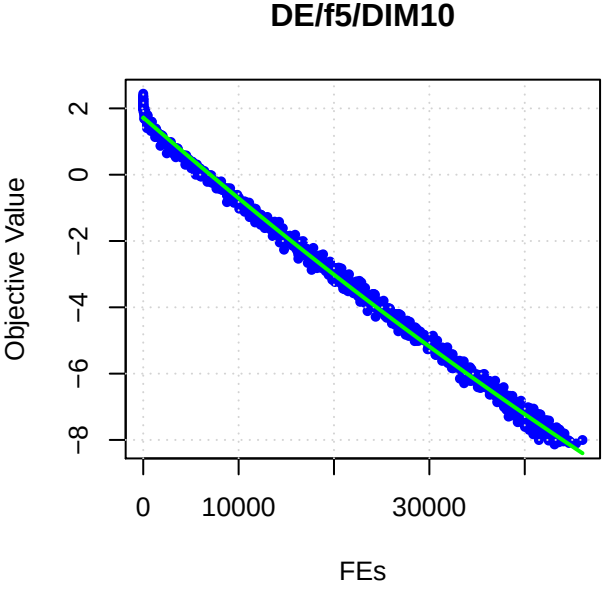
1000
3000
5000
FEs


DE/f5/DIM10
Objective Value
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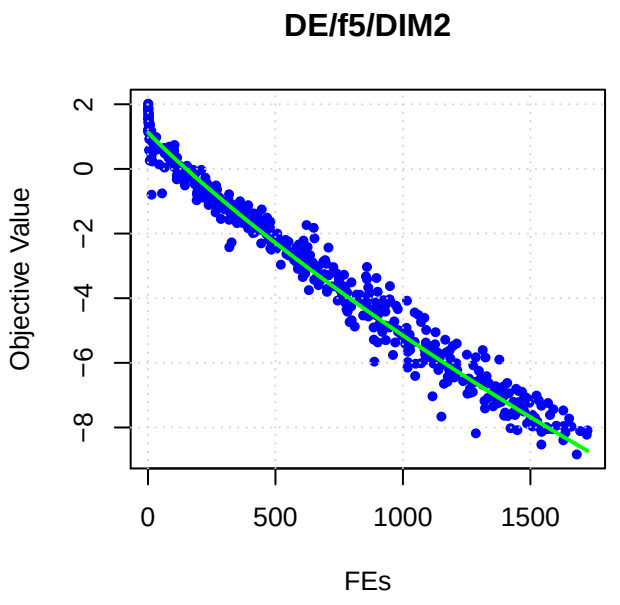
10000
30000
FEs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Objective Value
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−8
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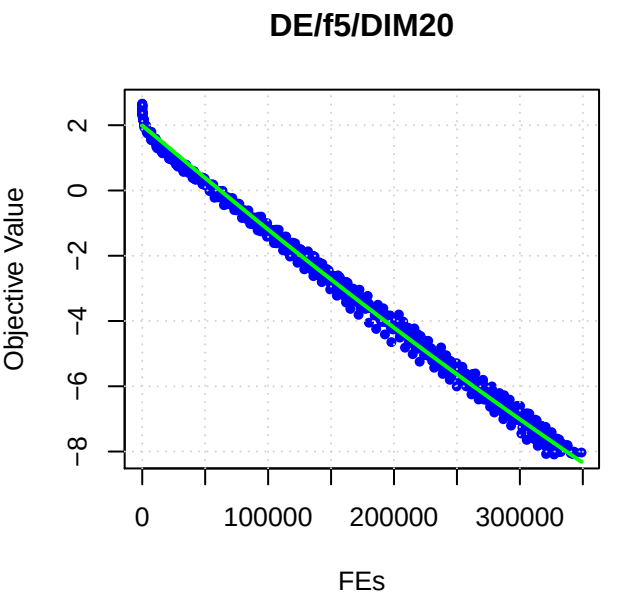
1000
1500


DE/f5/DIM20
Objective Value
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−2
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−6
−8
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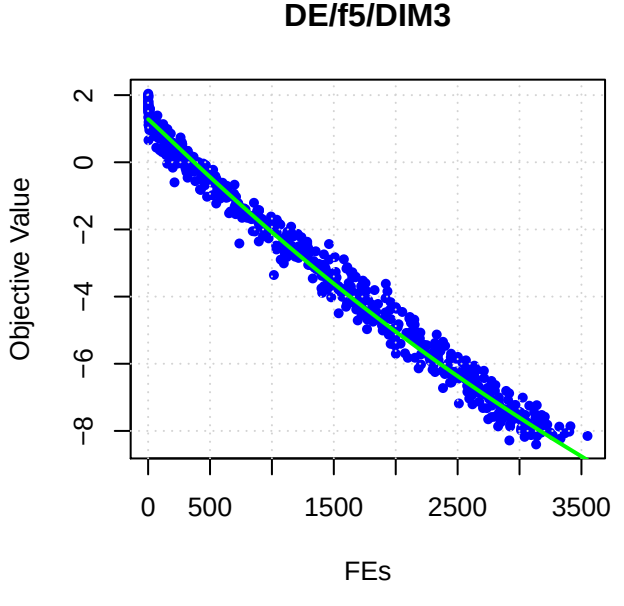
300000


DE/f5/DIM3
Objective Value
FEs
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−4
−6
−8
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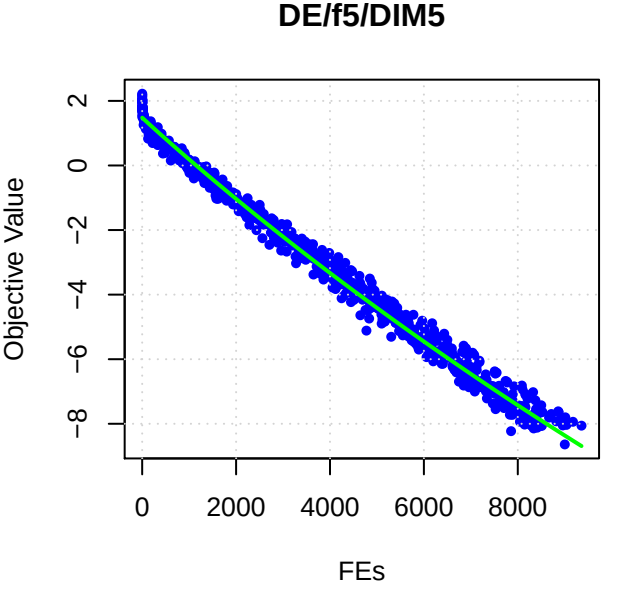
1500
2500
3500


DE/f5/DIM5
Objective Value
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−4
−6
−8
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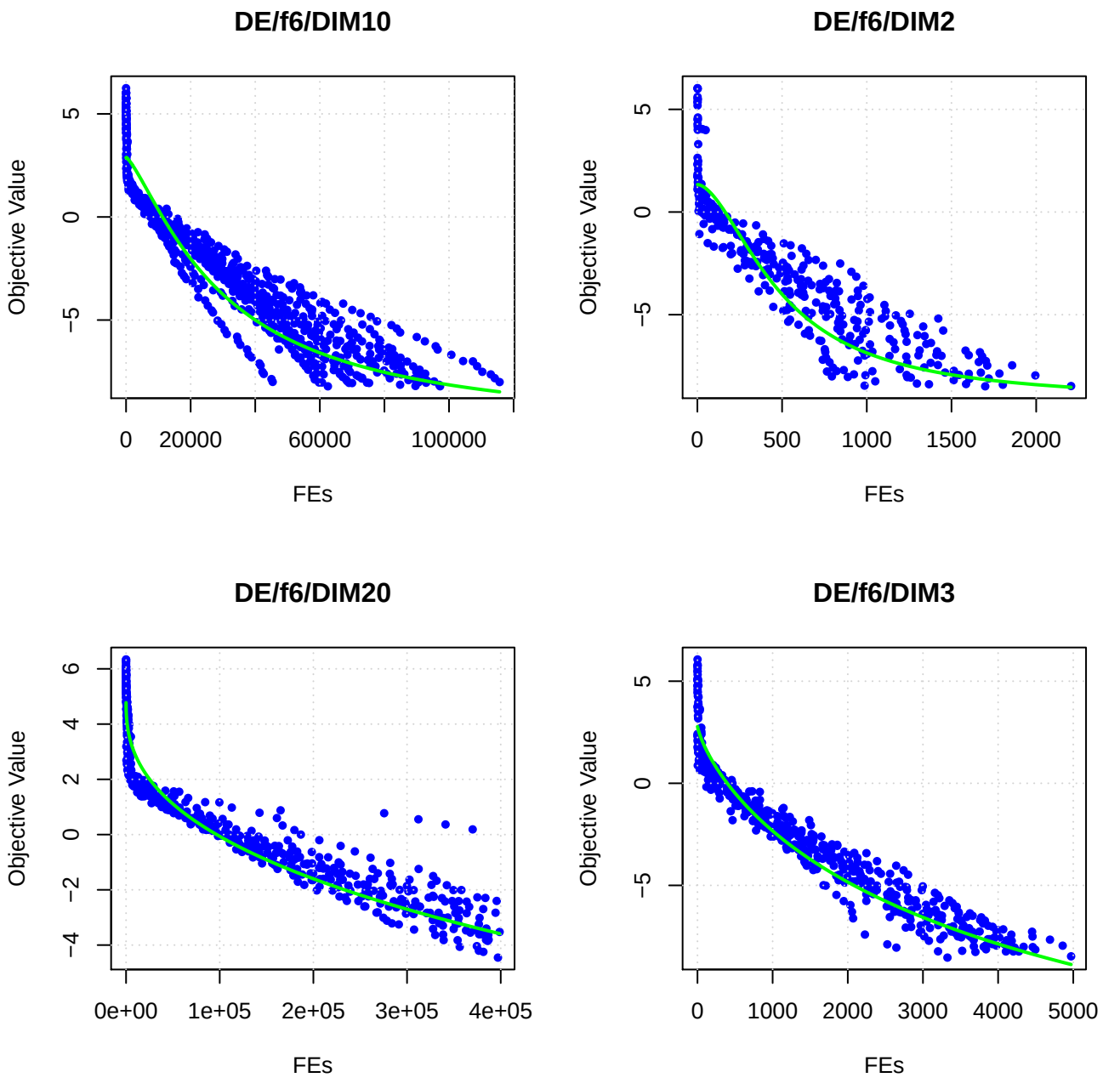
4000
6000
8000


DE/f6/DIM10
Objective Value
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20000
60000
100000
FEs
DE/f6/DIM2
Objective Value
5
0
−5
0
500
1000
1500
2000
FEs
DE/f6/DIM20
Objective Value
6
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2
0
−2
−4
0e+00
1e+05
2e+05
3e+05
4e+05
FEs
DE/f6/DIM3
Objective Value
5
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−5
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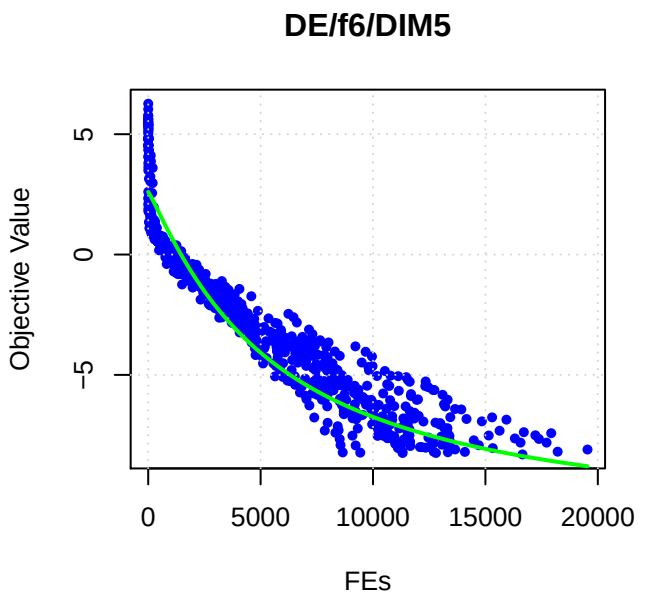
2000
3000
4000
5000
FEs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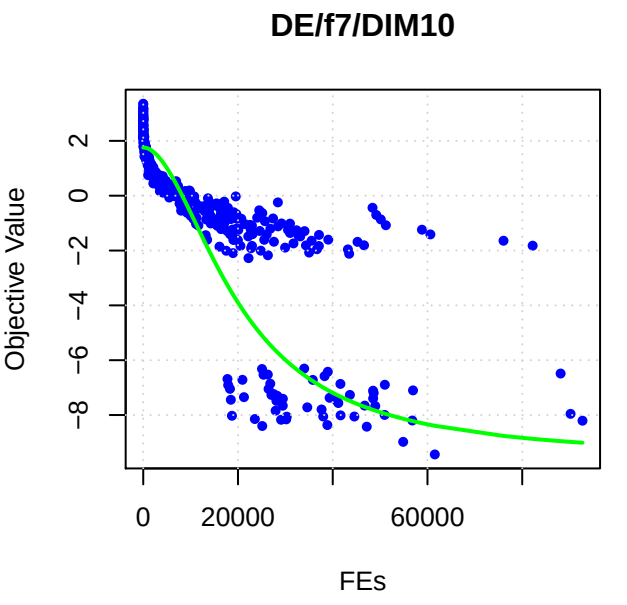
10000
15000
20000
FEs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Objective Value
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−4
−6
−8
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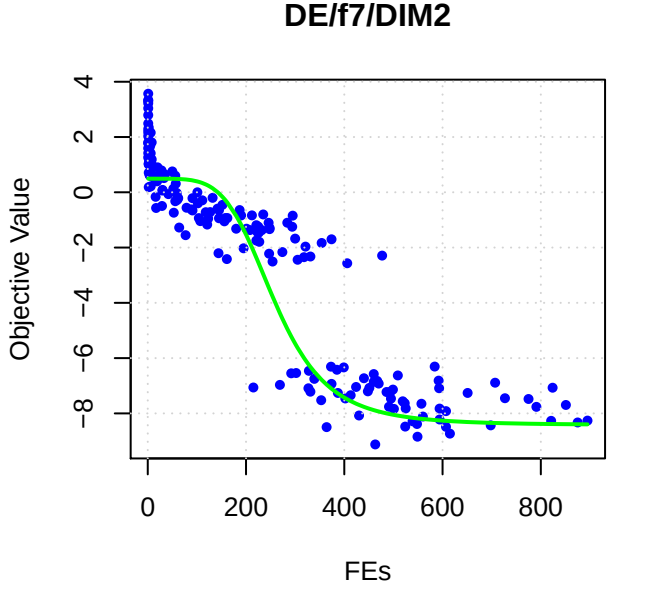
20000
60000
FEs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Objective Value
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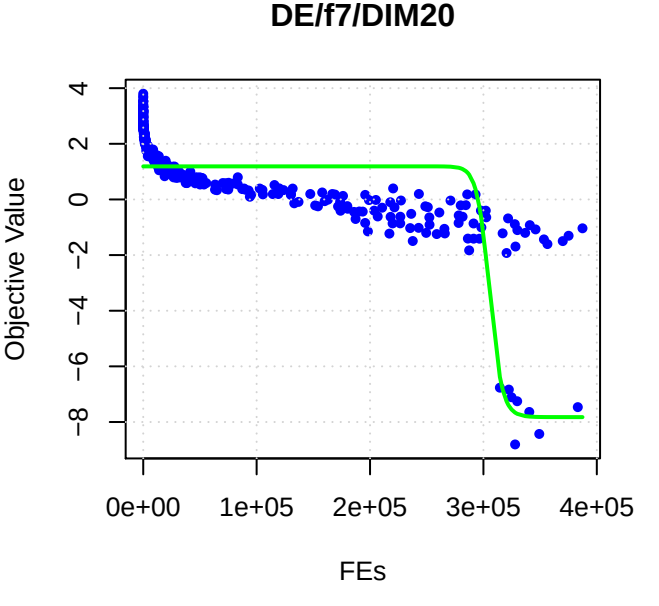
600
800
FEs


DE/f7/DIM20
Objective Value
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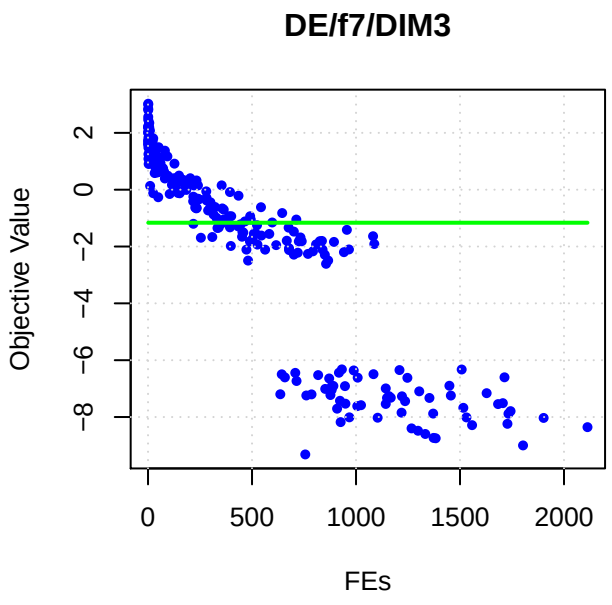
FEs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1000
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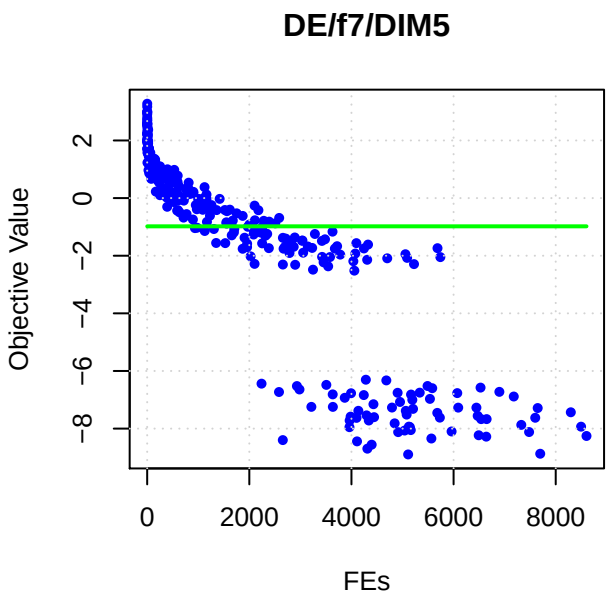
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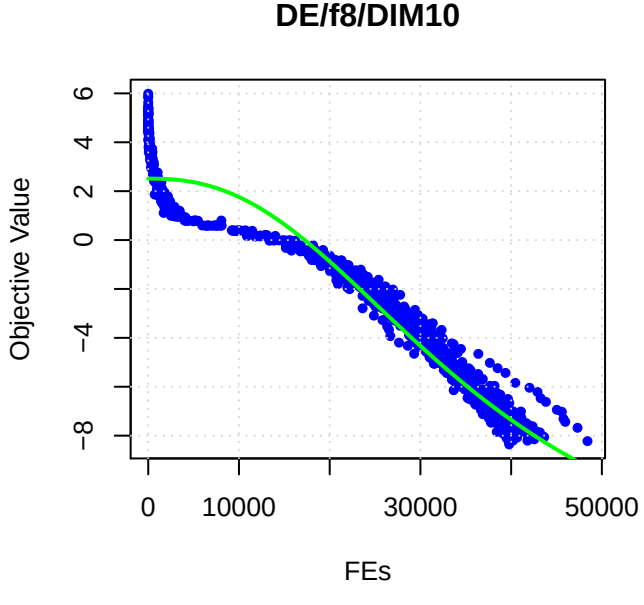
DE/f8/DIM10
Objective Value
FEs
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−4
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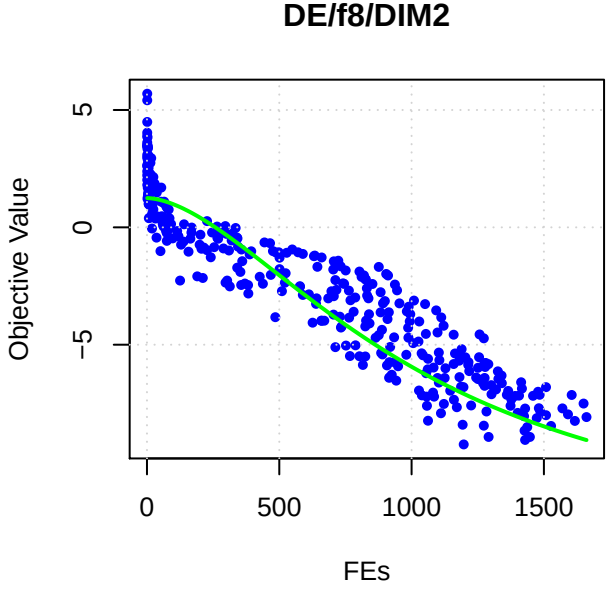
10000
30000
50000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Objective Value
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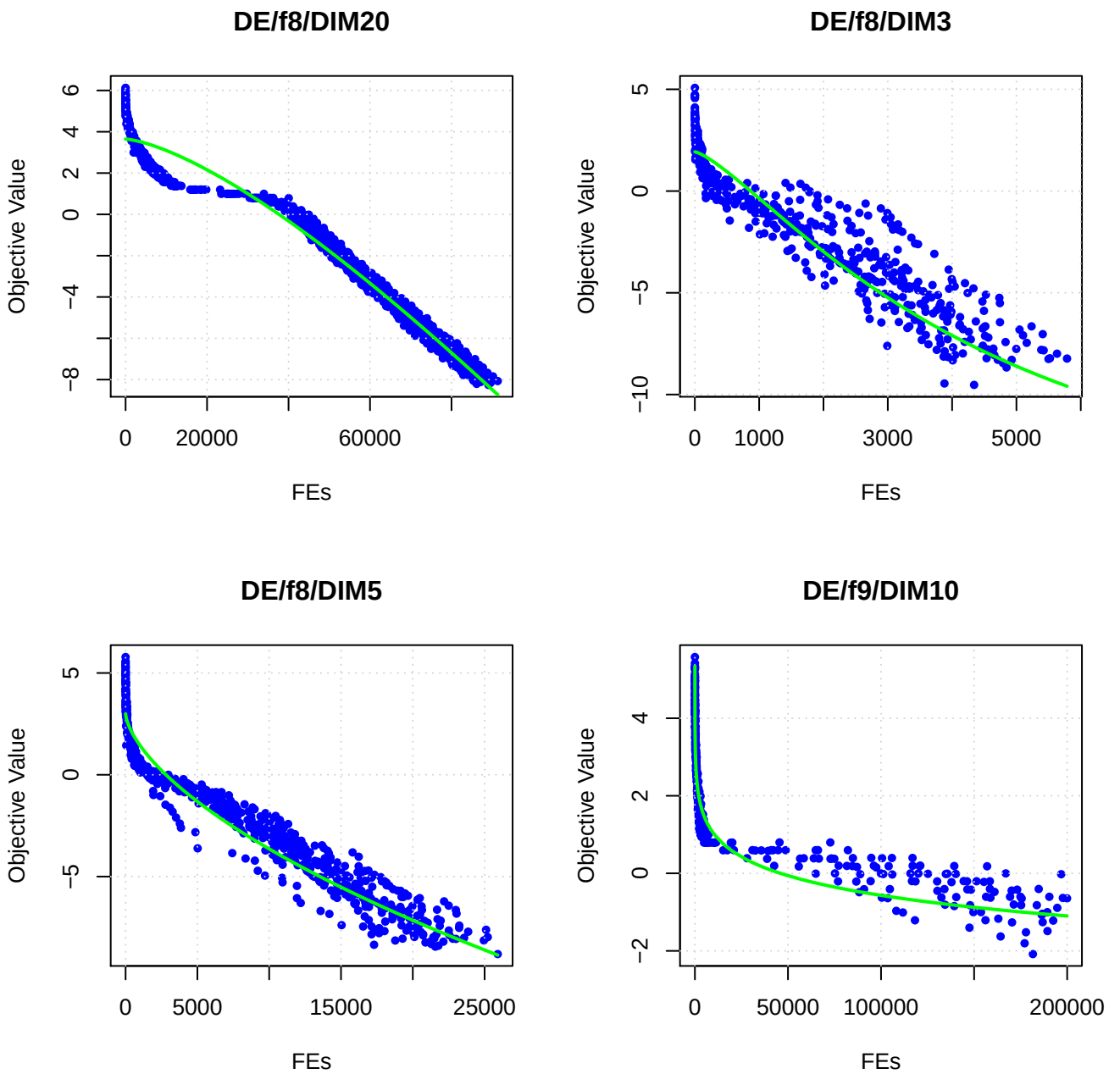
DE/f8/DIM20
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DE/f8/DIM3
Objective Value
FEs
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5000
DE/f8/DIM5
Objective Value
FEs
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−5
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25000
DE/f9/DIM10
Objective Value
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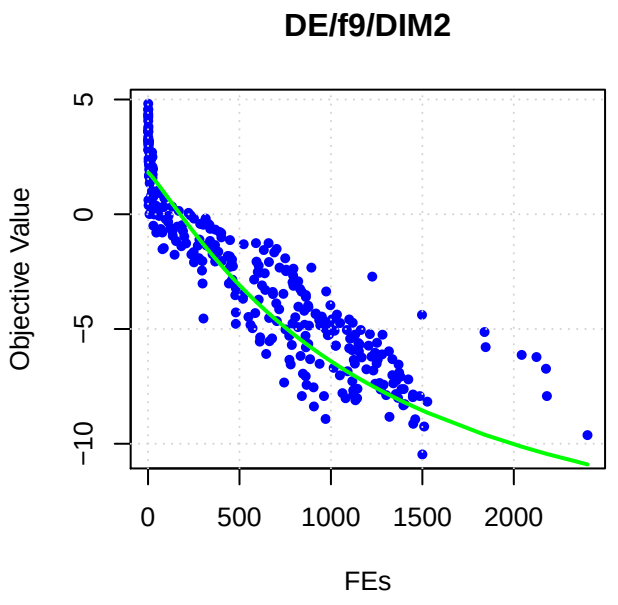
200000


DE/f9/DIM2
Objective Value
FEs
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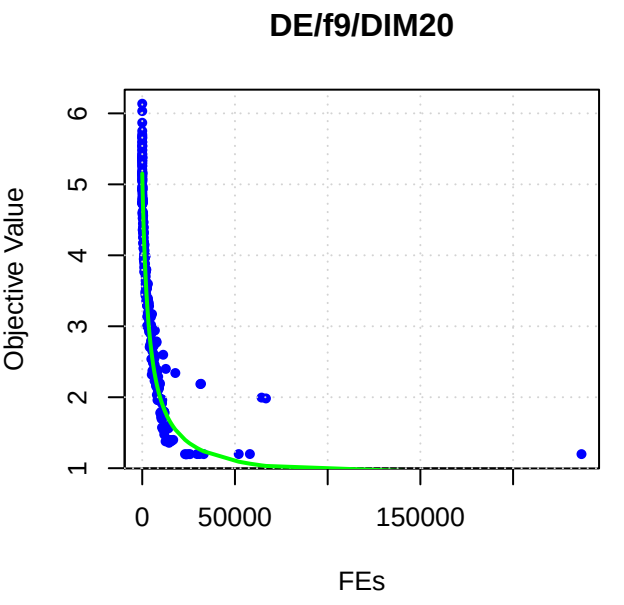
DE/f9/DIM20
Objective Value
FEs
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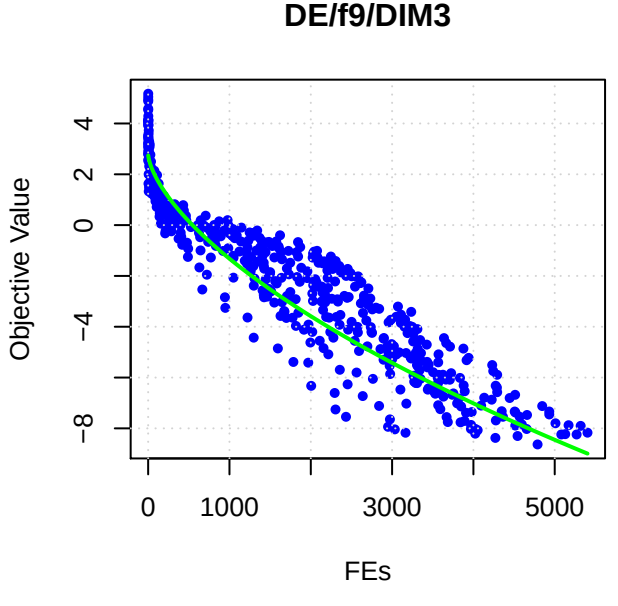
50000
150000


DE/f9/DIM3
Objective Value
FEs
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0
−4
−8
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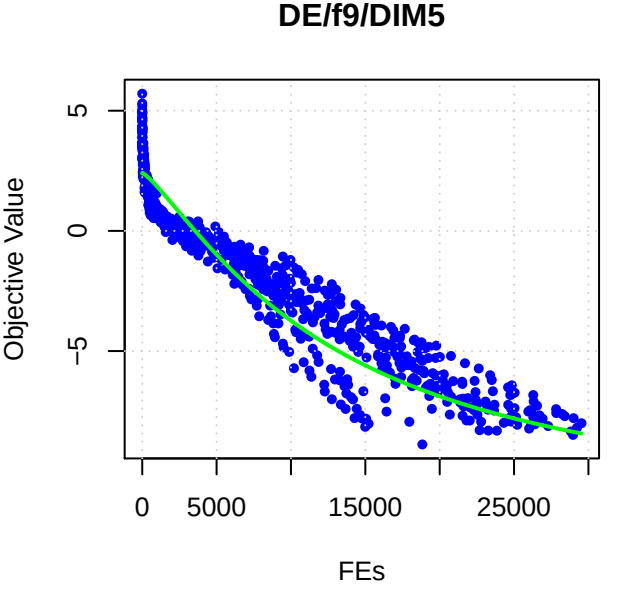
3000
5000


DE/f9/DIM5
Objective Value
FEs
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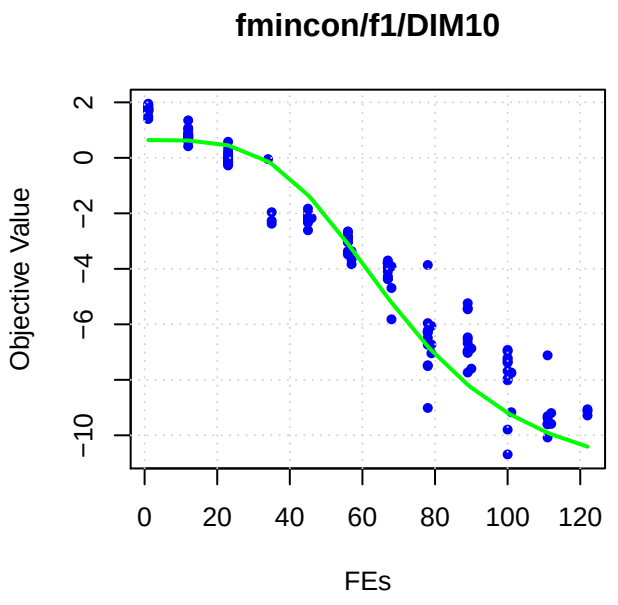
−5
0
5000
15000
25000


fmincon/f1/DIM10
Objective Value
FEs
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−4
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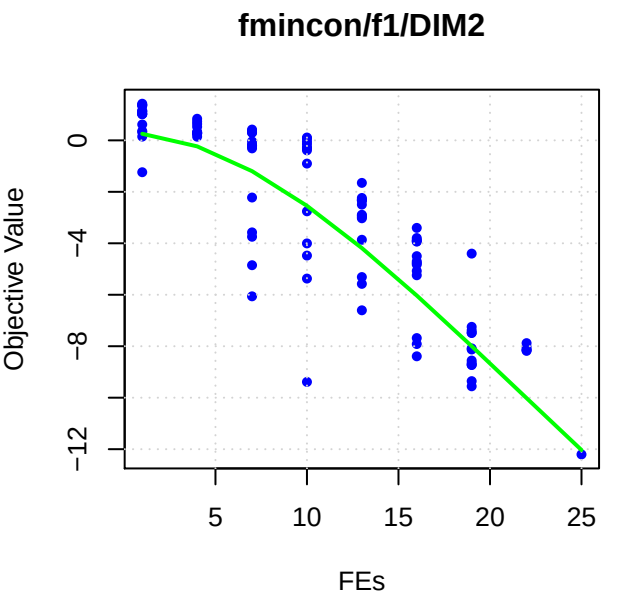
60
80
100
120


fmincon/f1/DIM2
Objective Value
FEs
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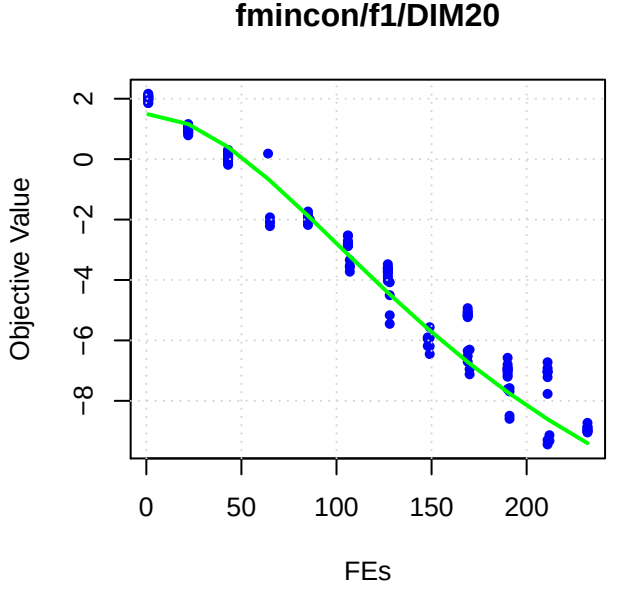
10
15
20
25


fmincon/f1/DIM20
Objective Value
FEs
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−2
−4
−6
−8
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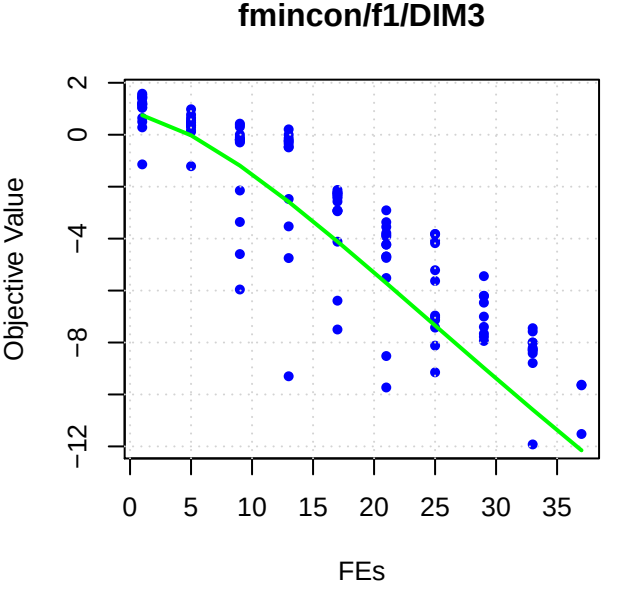
50
100
150
200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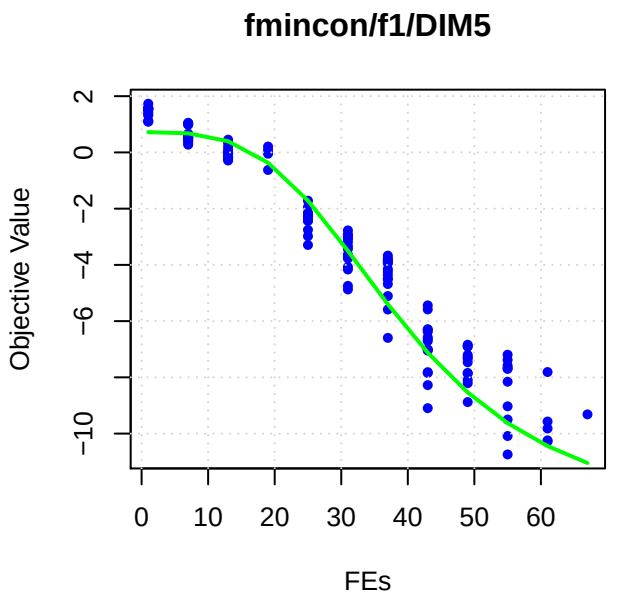
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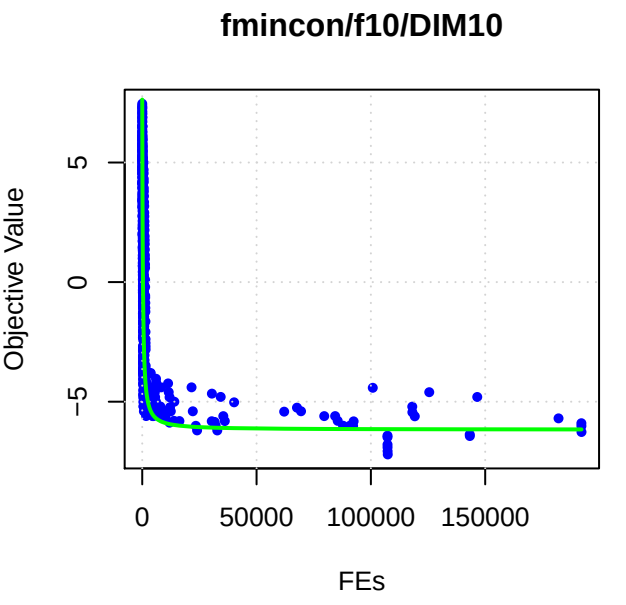
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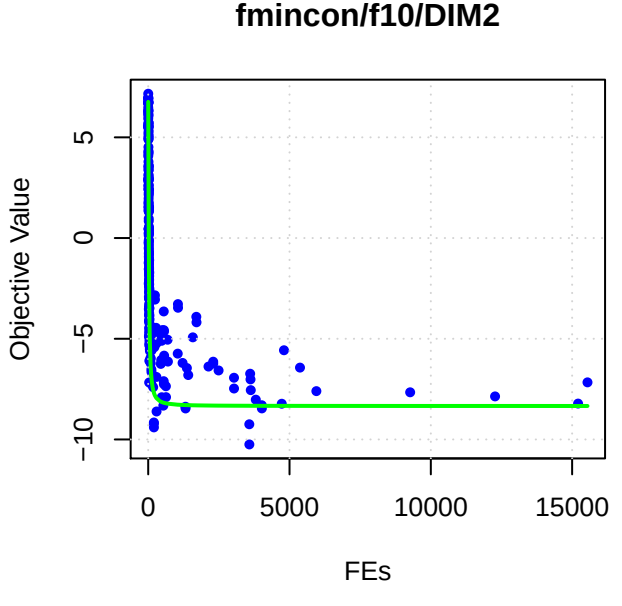
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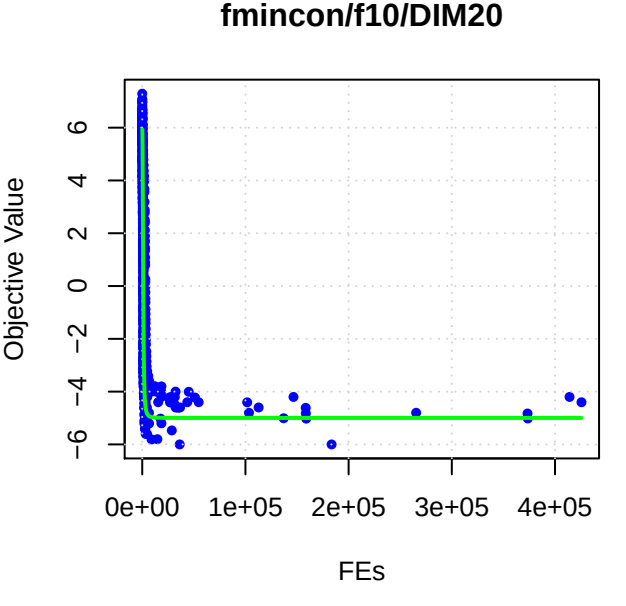
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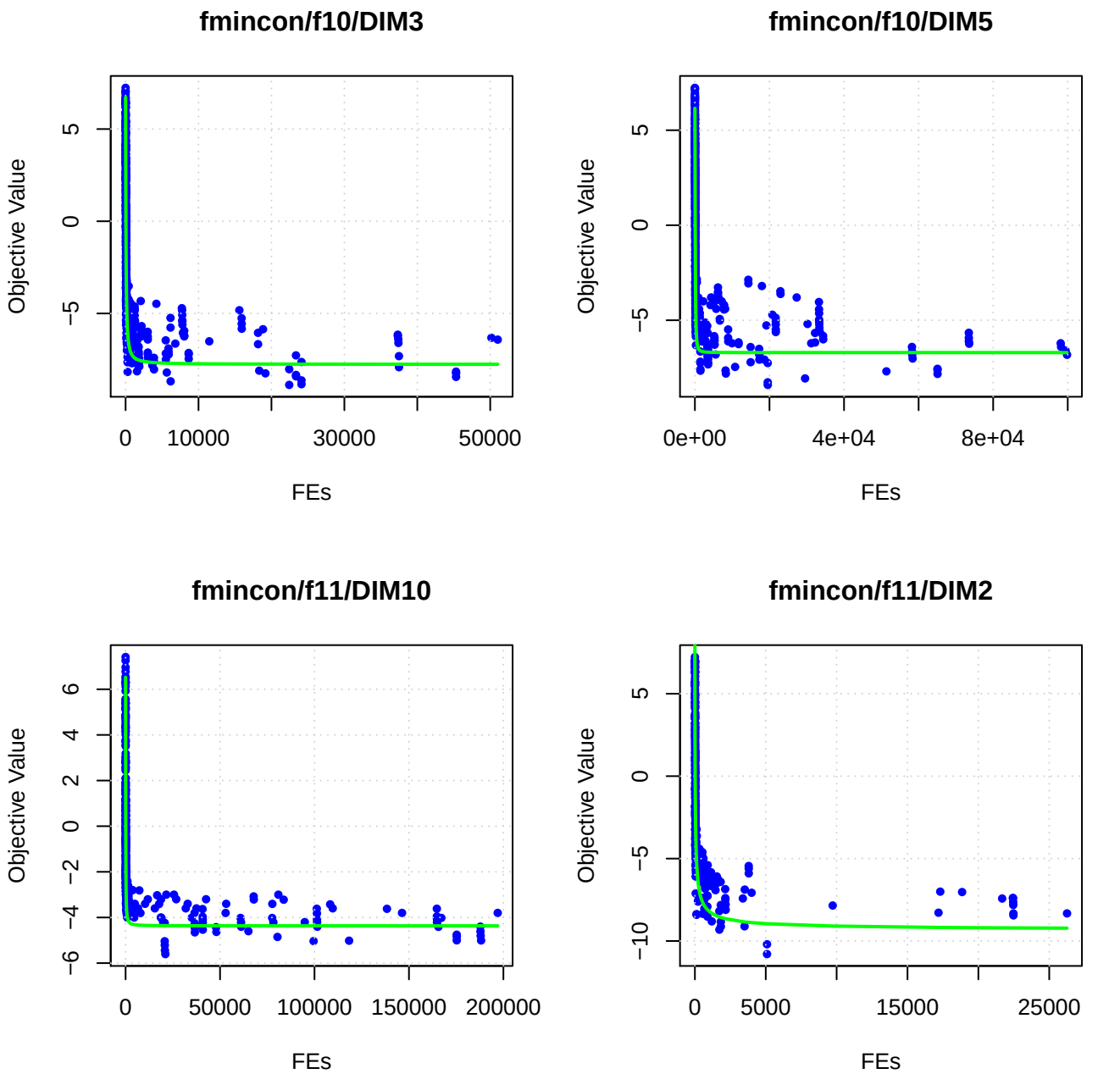
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FEs
fmincon/f10/DIM5
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FEs
fmincon/f11/DIM10
Objective Value
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4
2
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15000
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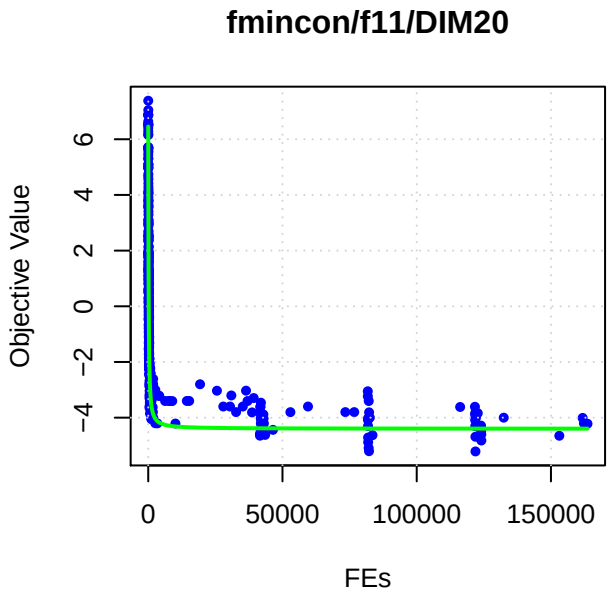
FEs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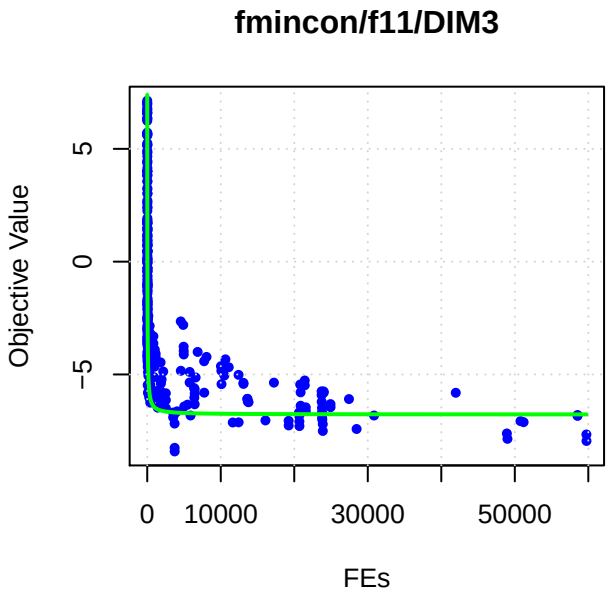
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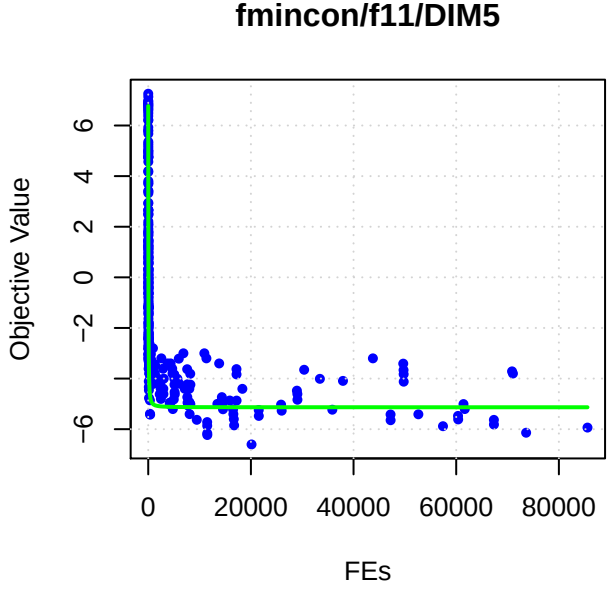
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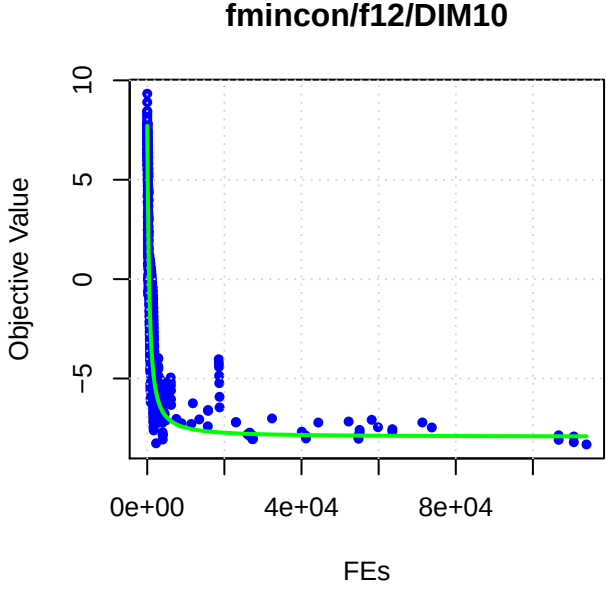
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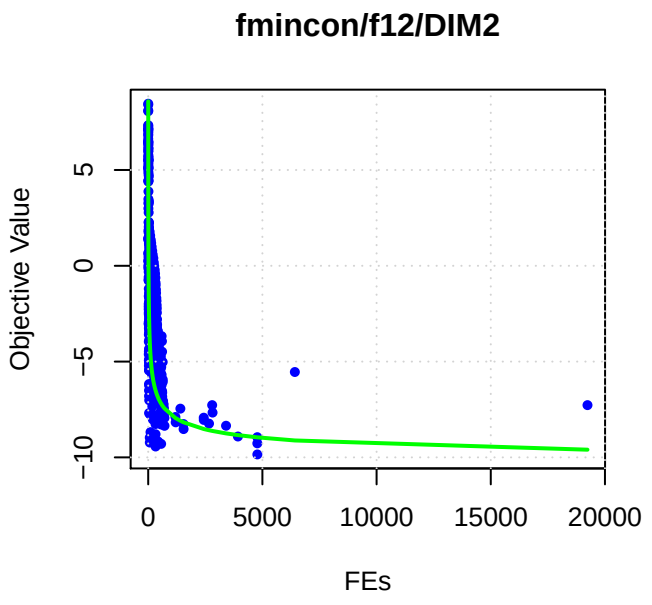
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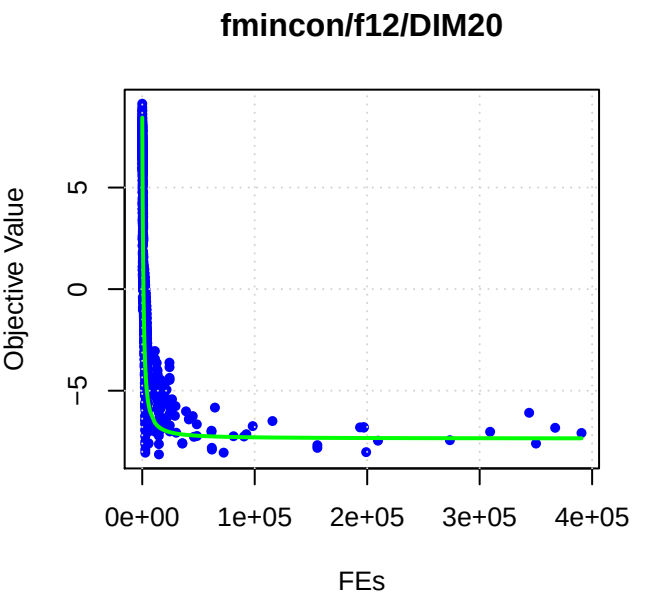
20000
FEs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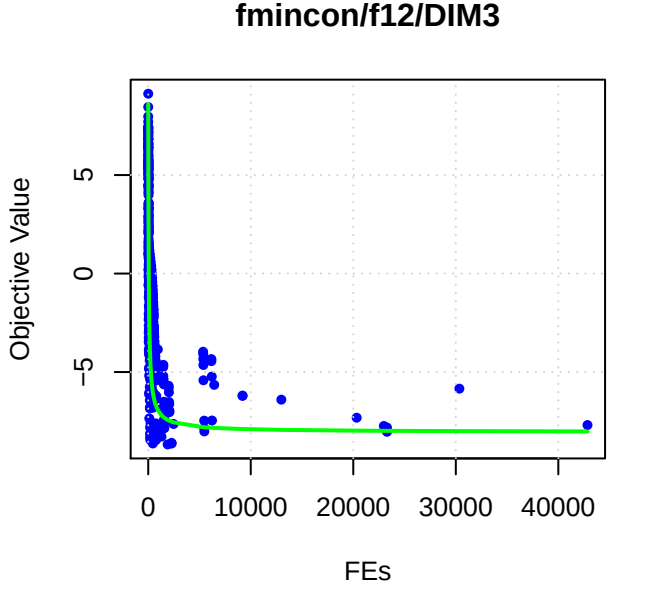
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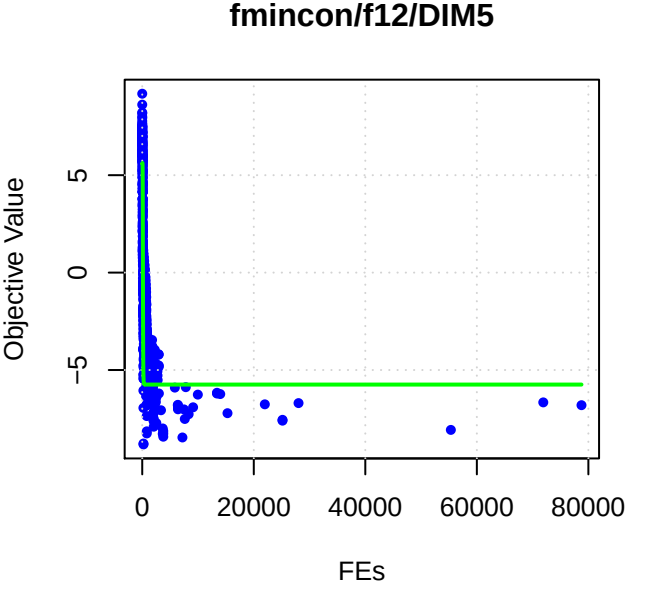
FEs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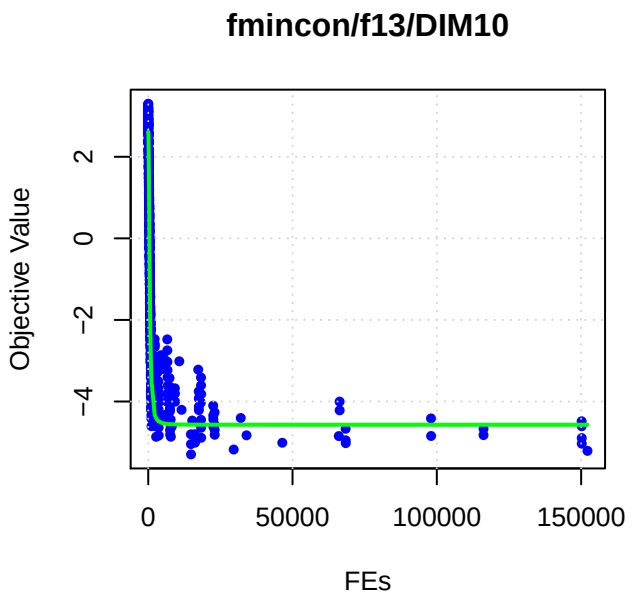
FEs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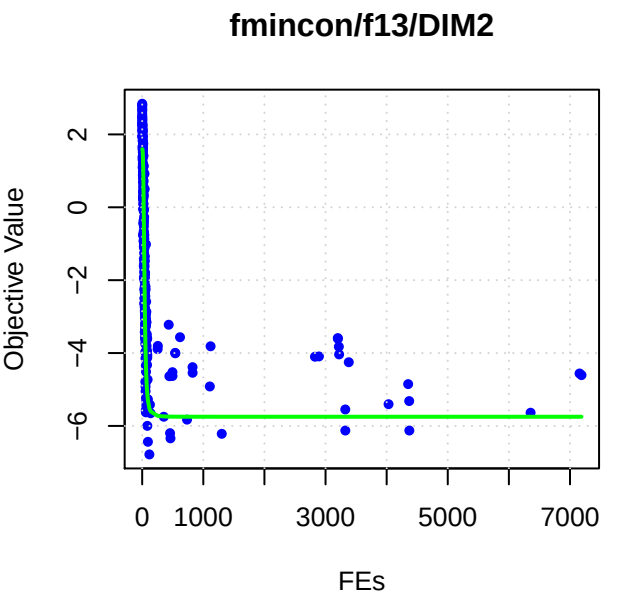
FEs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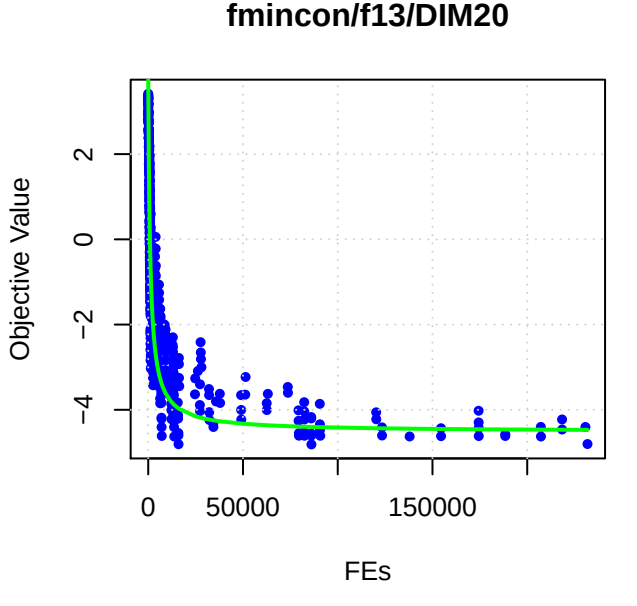
FEs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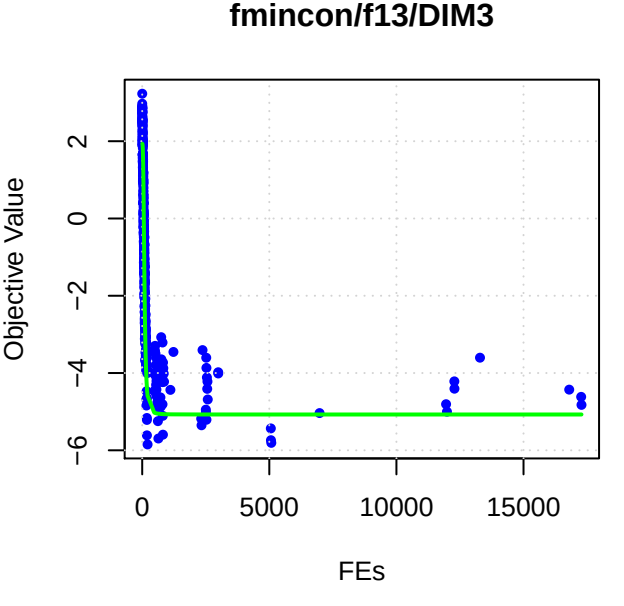
150000
FEs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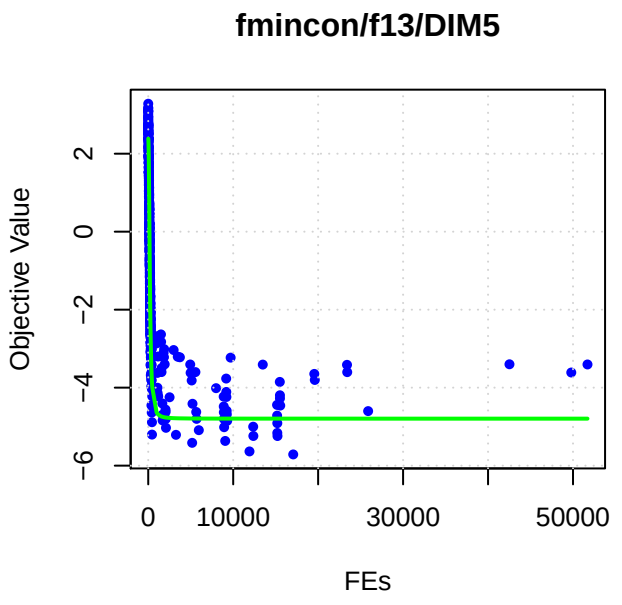
10000
15000
FEs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FEs
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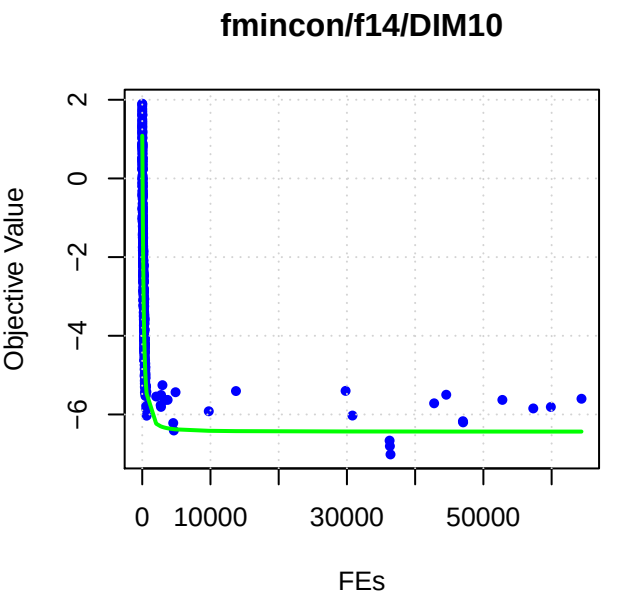
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Objective Value
FEs
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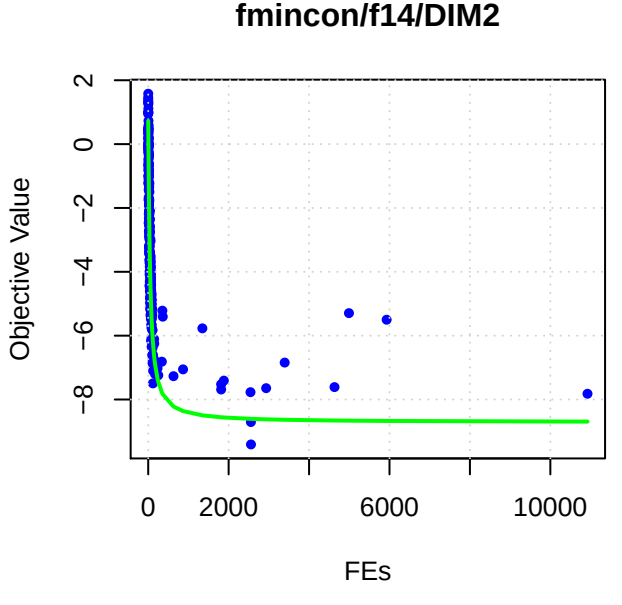
50000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Objective Value
FEs
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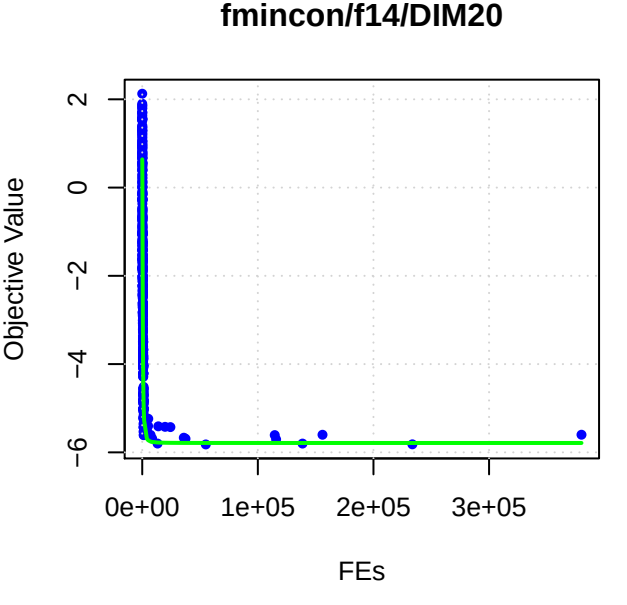
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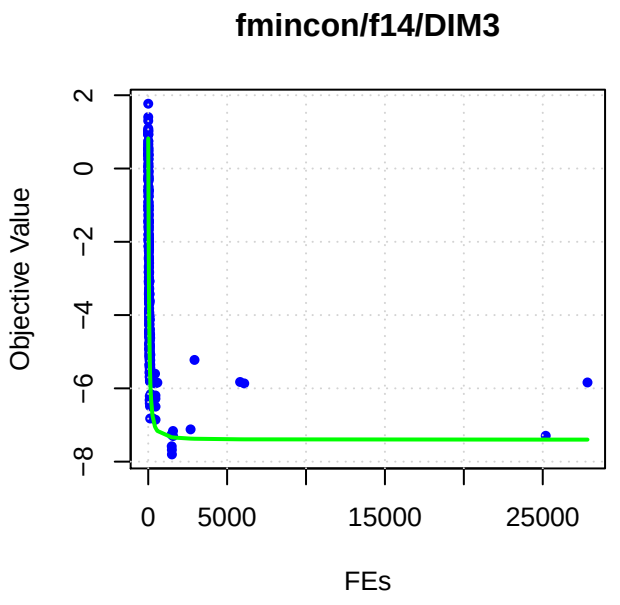
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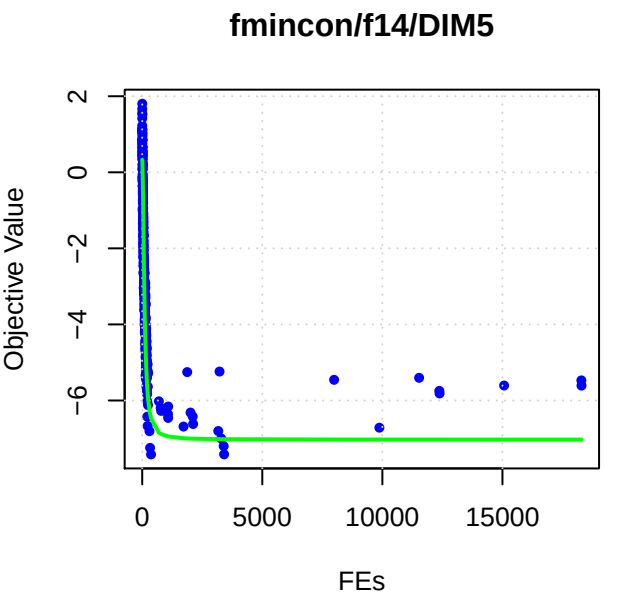
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10000
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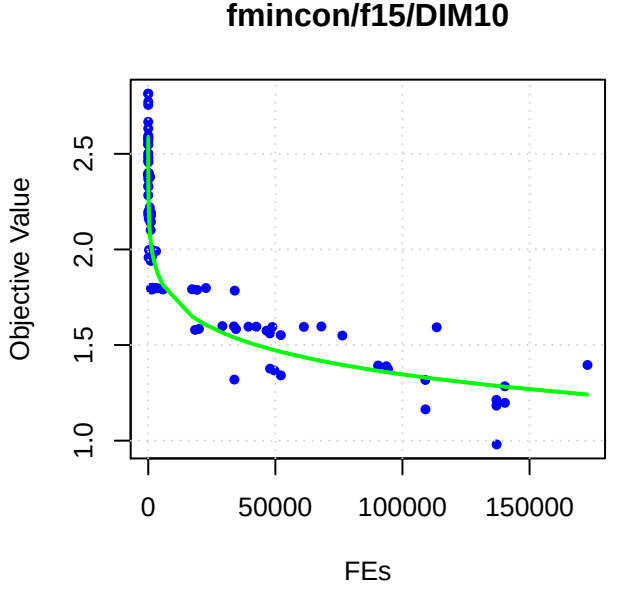
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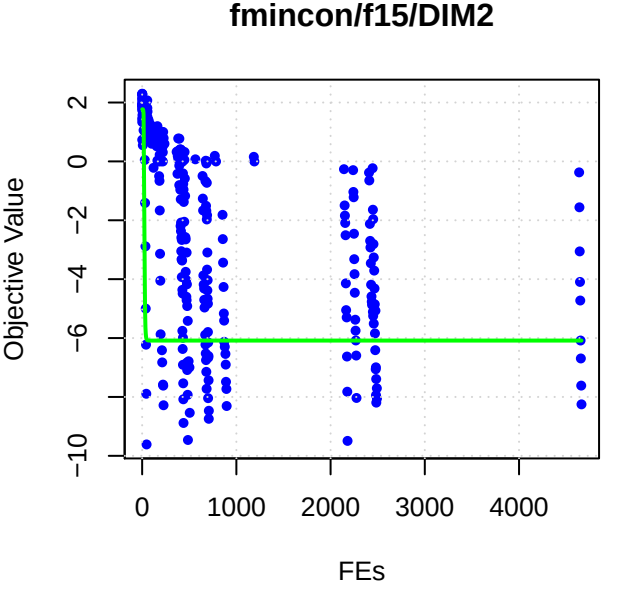
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Objective Value
FEs
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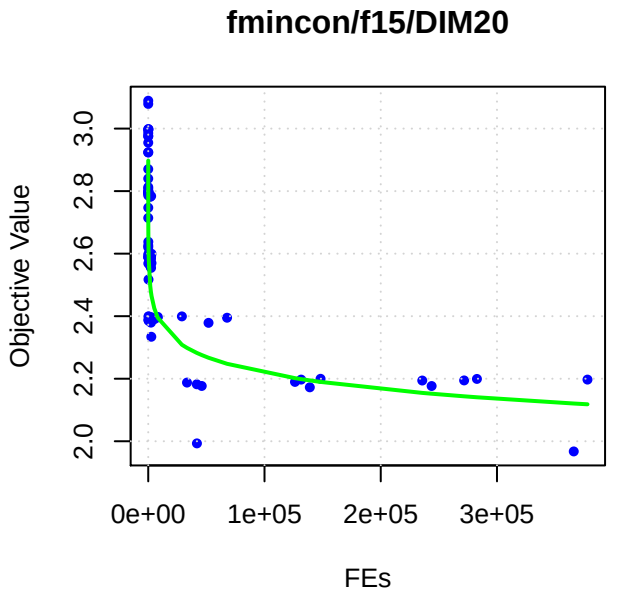
2000
3000
4000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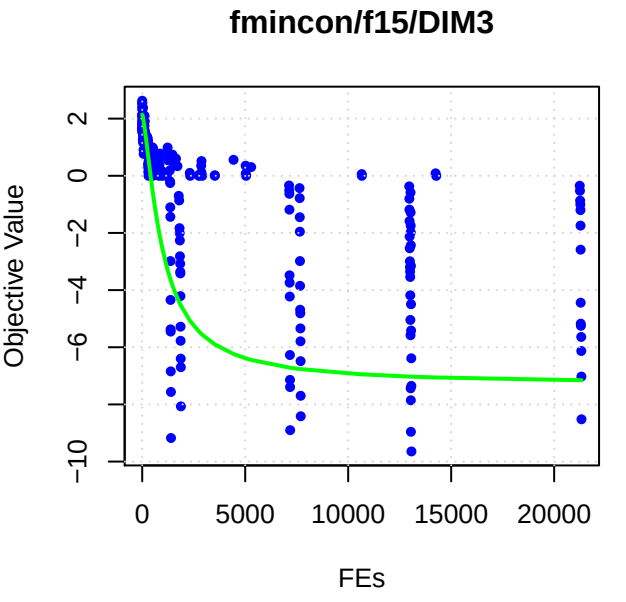
FEs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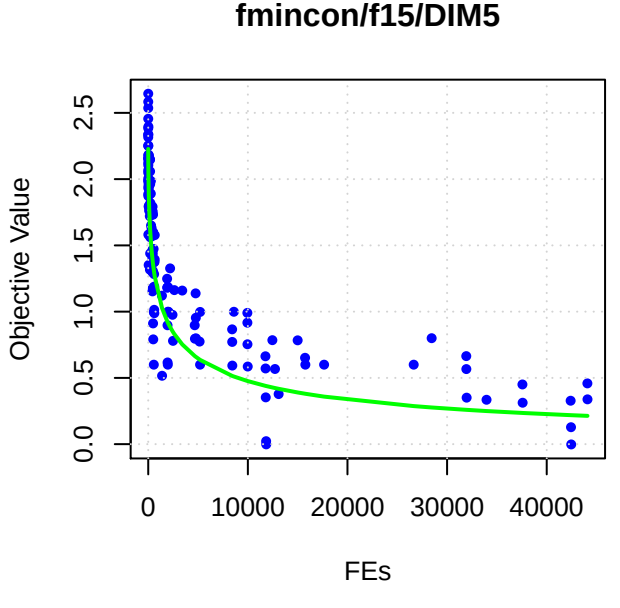
15000
20000
FEs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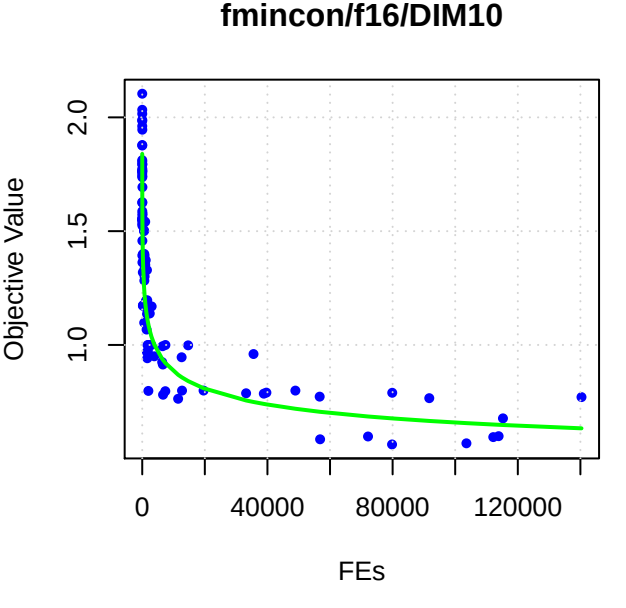
FEs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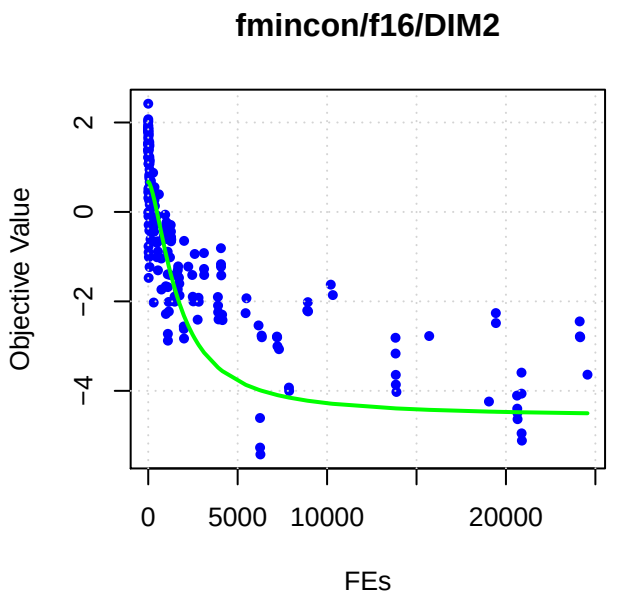
80000
120000
FEs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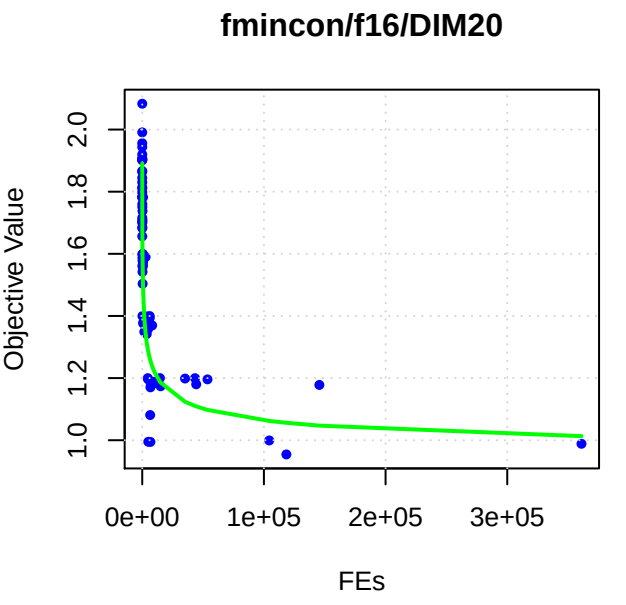
10000
20000
FEs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1.6
1.4
1.2
1.0
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1e+05
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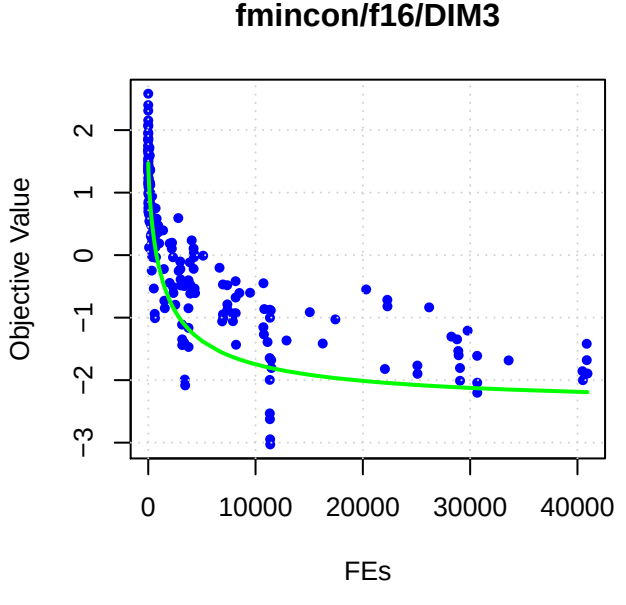
3e+05
FEs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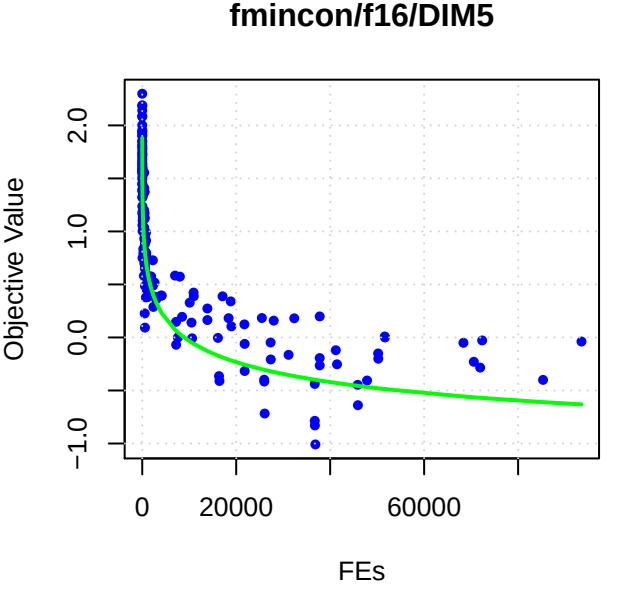
30000
40000
FEs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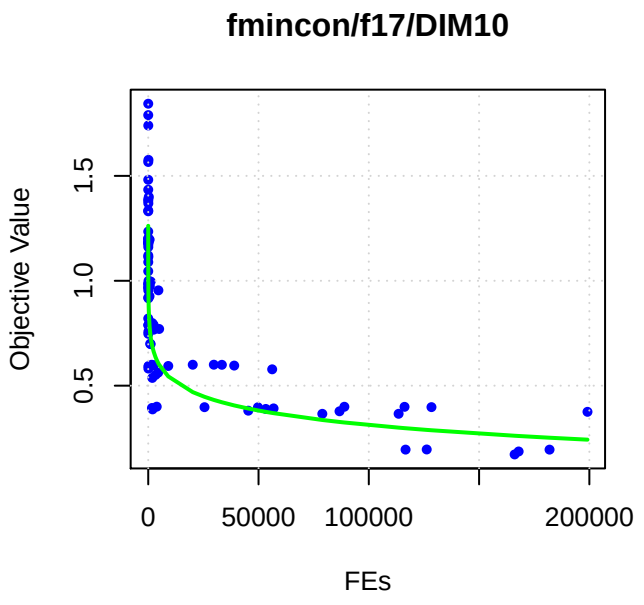
FEs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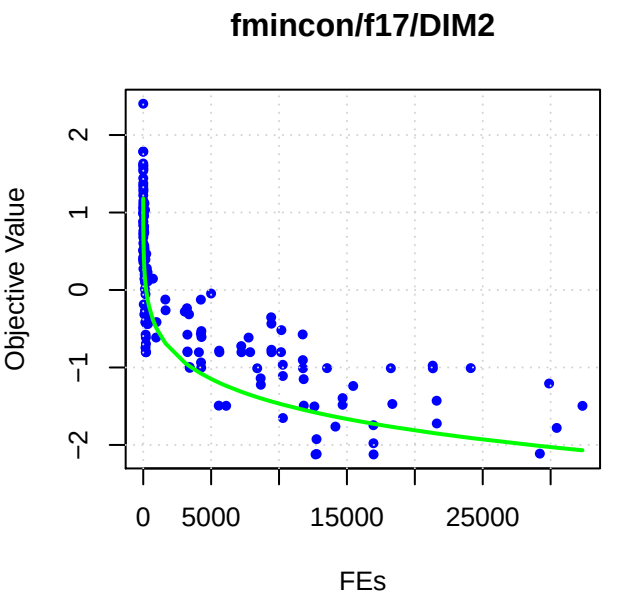
200000
FEs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2
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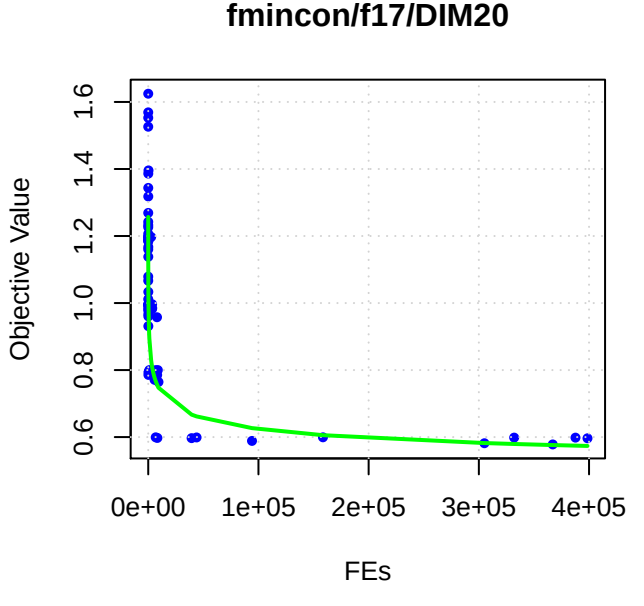
15000
25000
FEs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1.4
1.6
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2e+05
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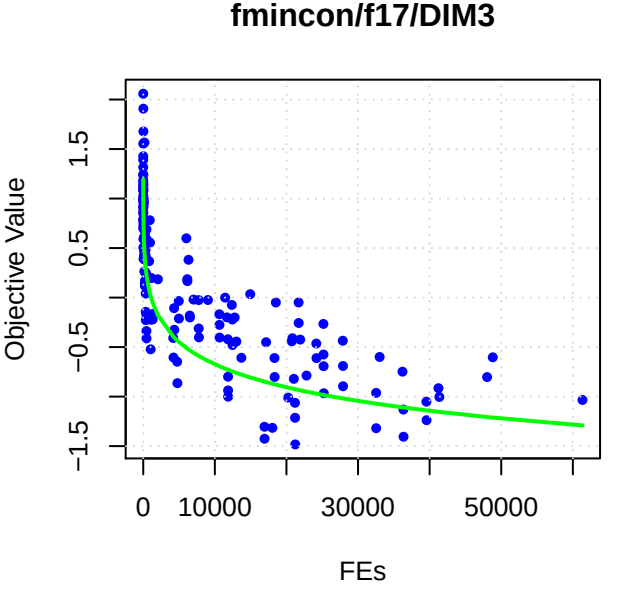
4e+05
FEs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1.5
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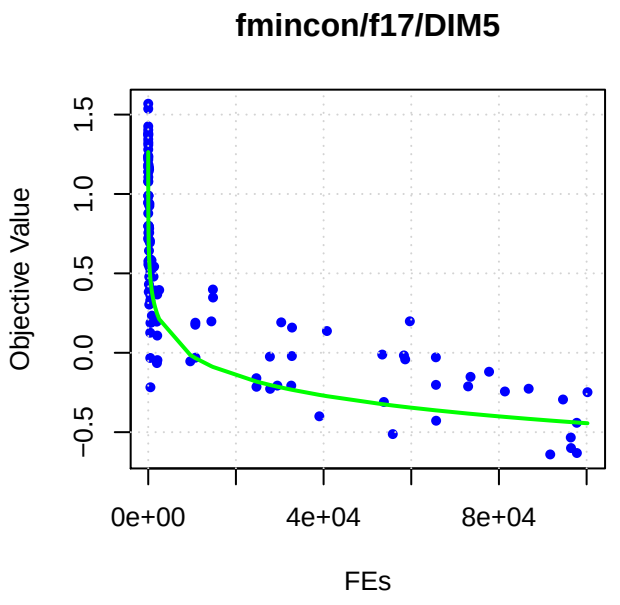
50000
FEs


fmincon/f17/DIM5
Objective Value
FEs
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8e+04
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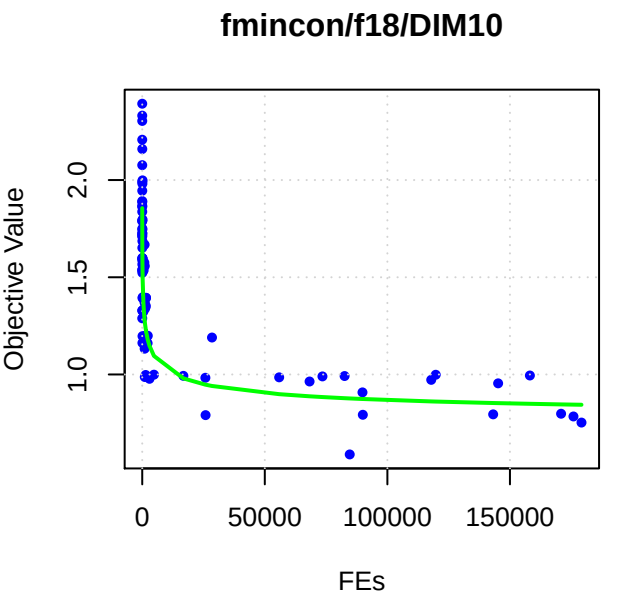
0.5
1.0
1.5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Objective Value
FEs
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100000
150000
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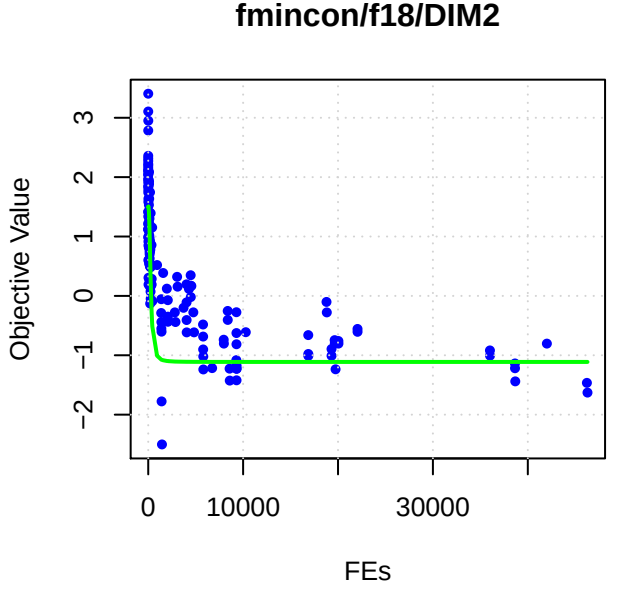
2.0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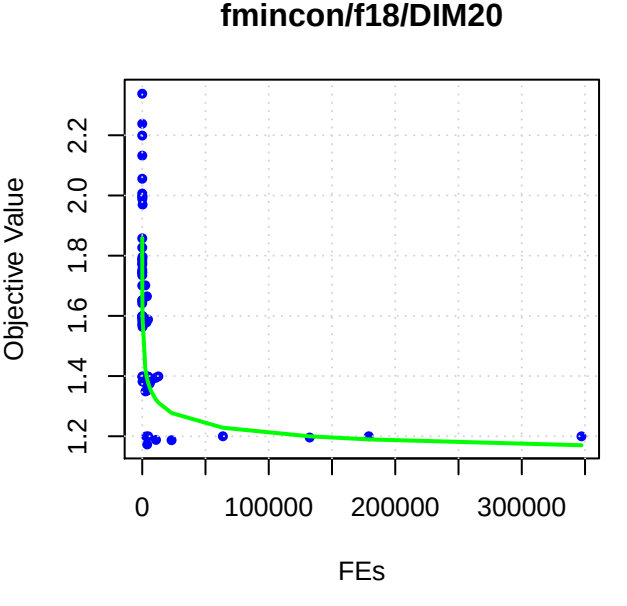
2
3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FEs
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200000
300000
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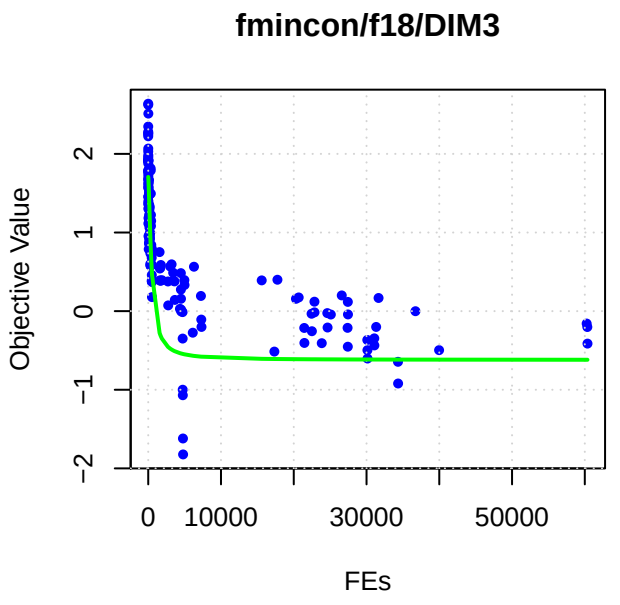
1.4
1.6
1.8
2.0
2.2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Objective Value
FEs
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−1
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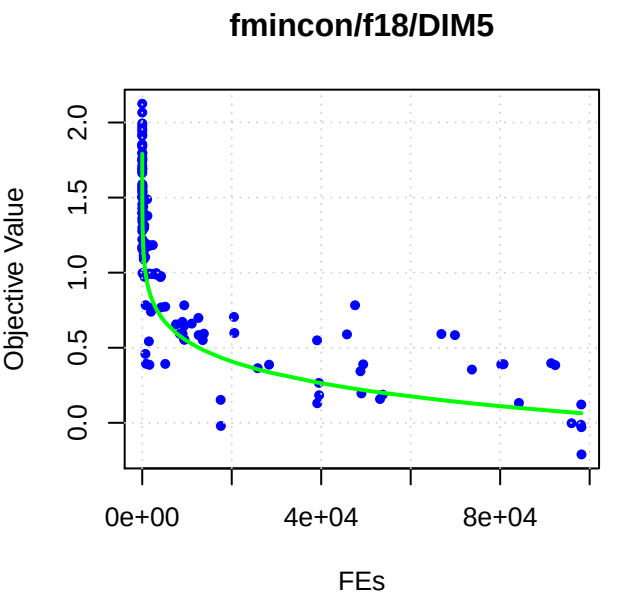
10000
30000
50000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FEs
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1.0
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0.0
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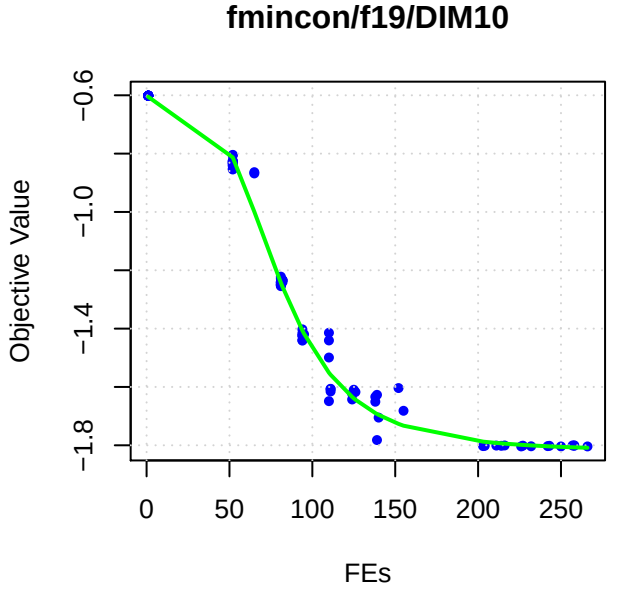
4e+04
8e+04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−1.4
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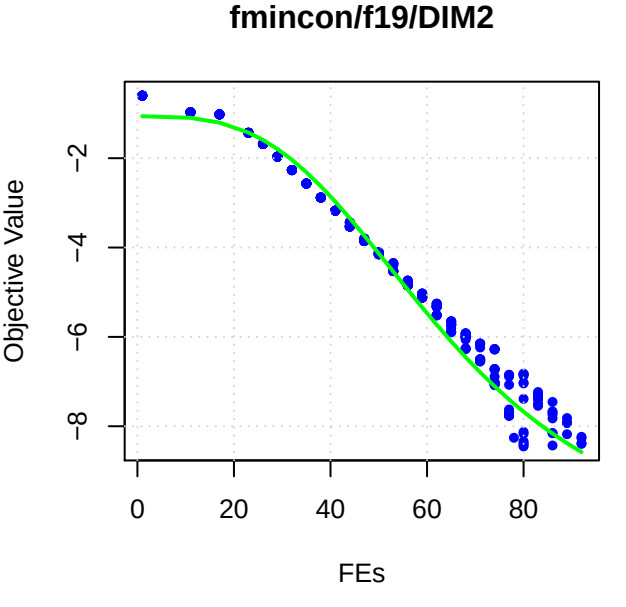
150
200
250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FEs
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−4
−6
−8
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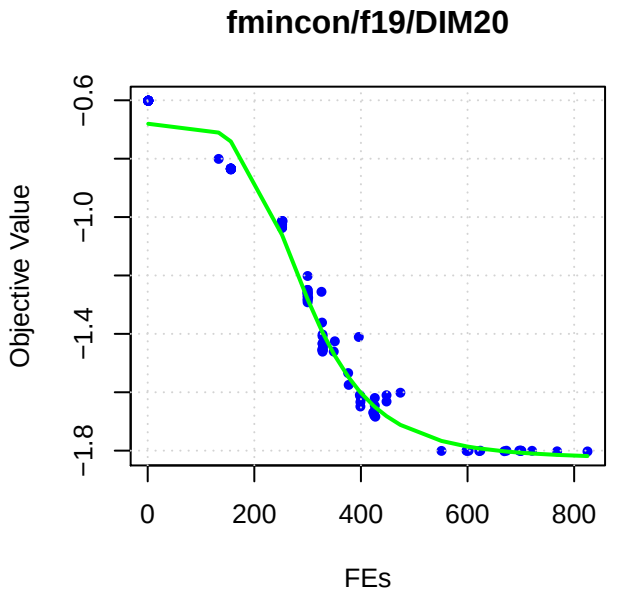
20
40
60
80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−1.4
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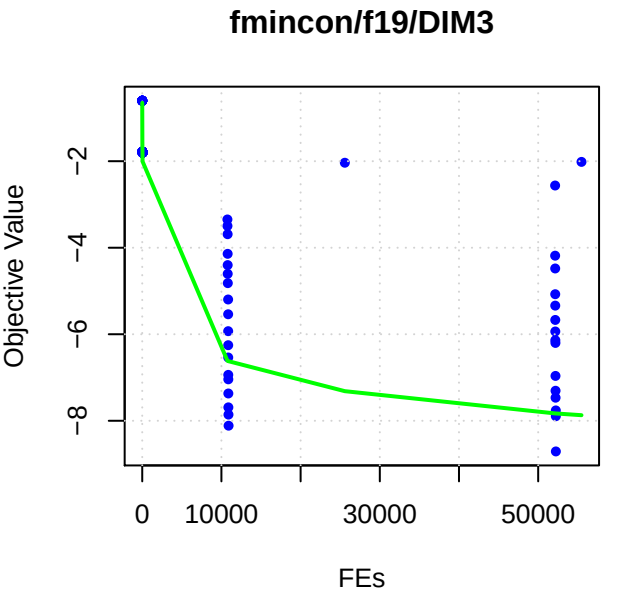
600
800
FEs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Objective Value
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−6
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10000
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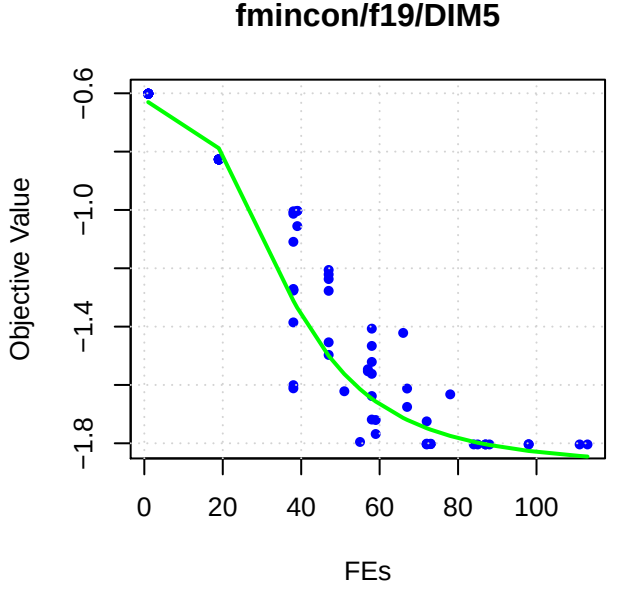
50000
FEs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Objective Value
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−1.0
−1.4
−1.8
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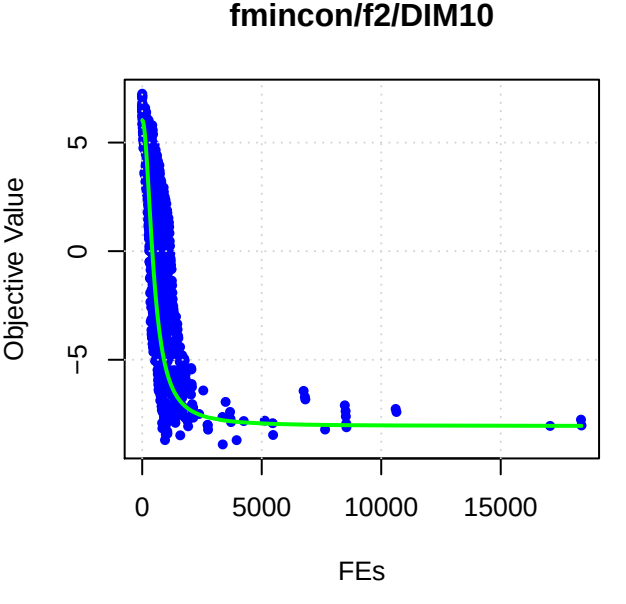
20
40
60
80
100
FEs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Objective Value
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−5
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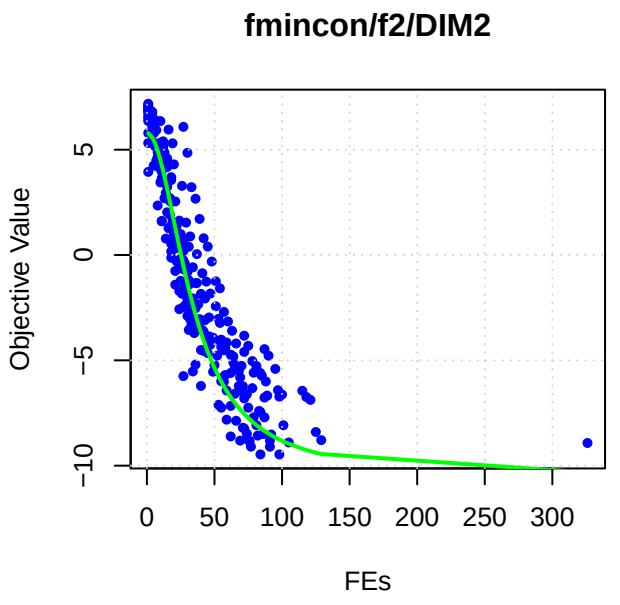
5000
10000
15000
FEs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Objective Value
FEs
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−10
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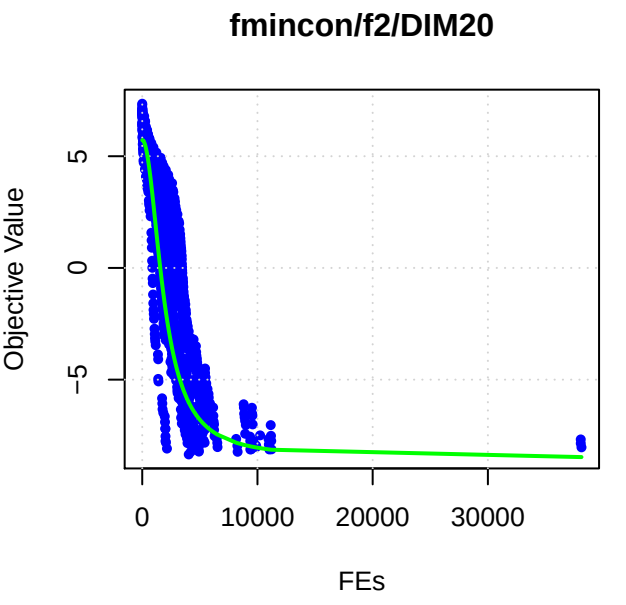
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Objective Value
FEs
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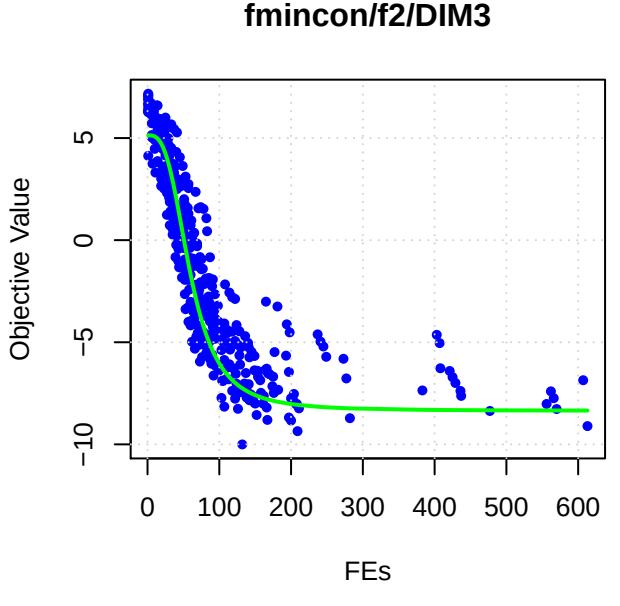
0
10000
20000
30000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Objective Value
FEs
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−5
−10
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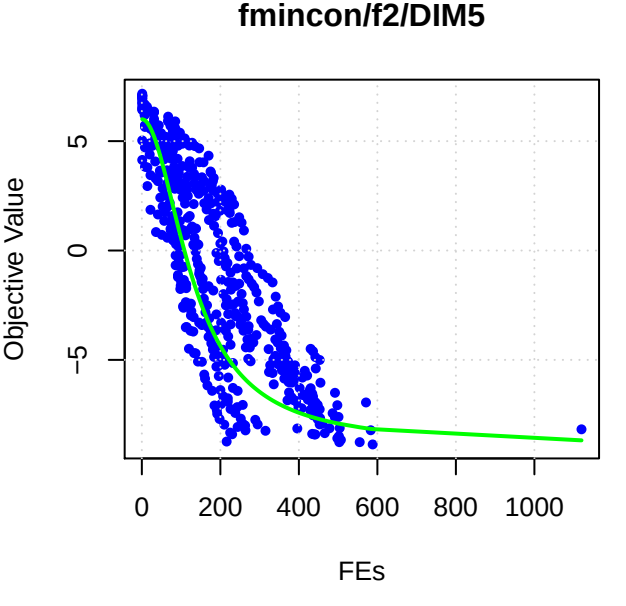
200
300
400
500
600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Objective Value
FEs
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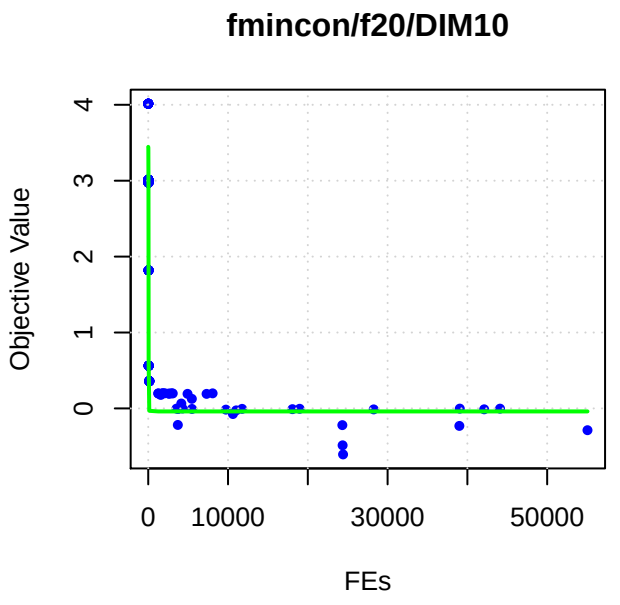
0
−5
0
200
400
600
800
1000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Objective Value
FEs
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3
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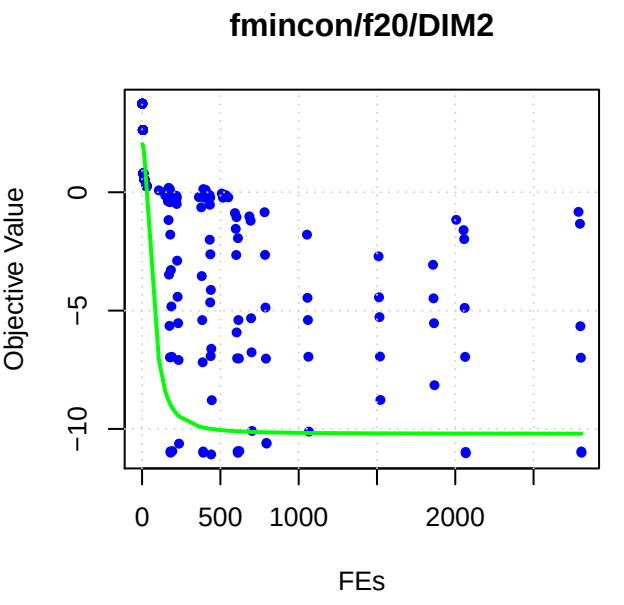
10000
30000
50000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Objective Value
FEs
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−10
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1000
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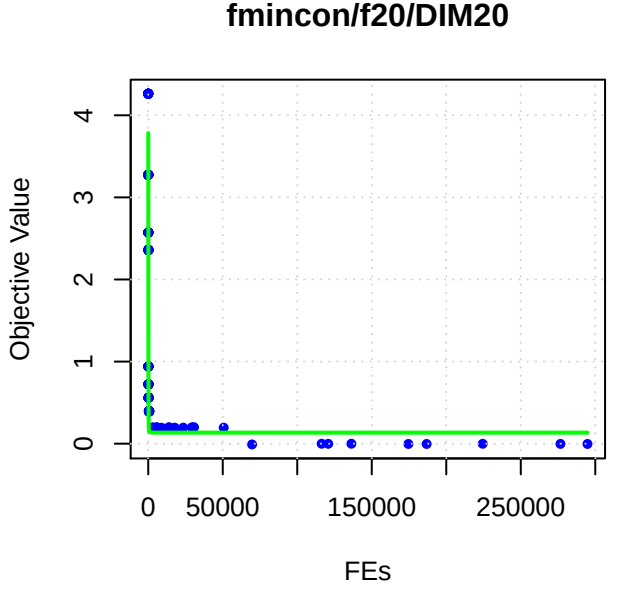
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Objective Value
FEs
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1
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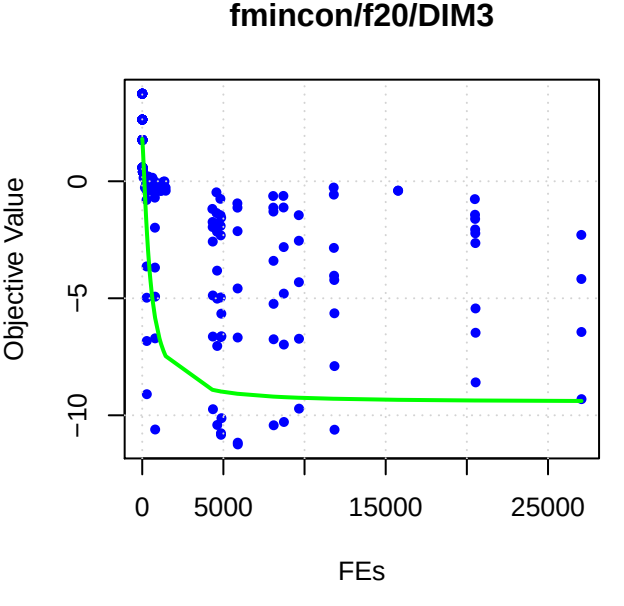
150000
250000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Objective Value
FEs
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−5
−10
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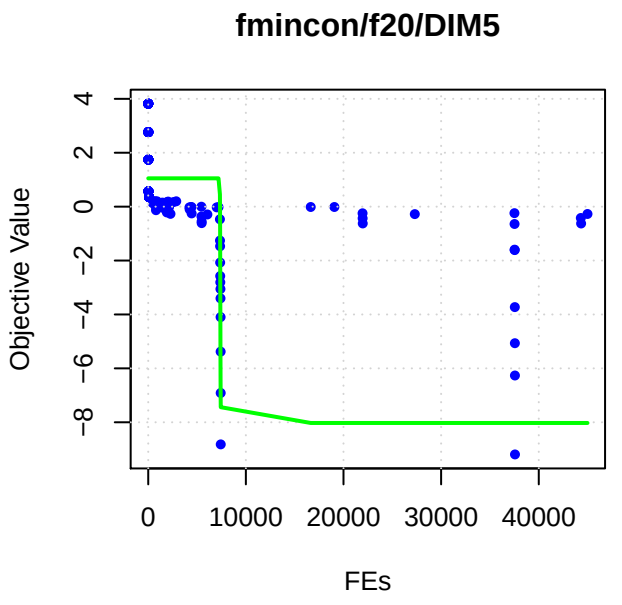
5000
15000
25000


fmincon/f20/DIM5
Objective Value
FEs
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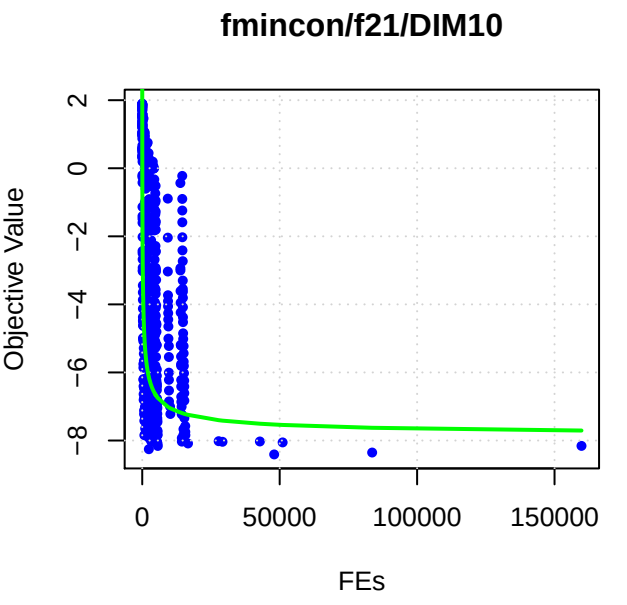
10000
20000
30000
40000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Objective Value
FEs
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0
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−4
−6
−8
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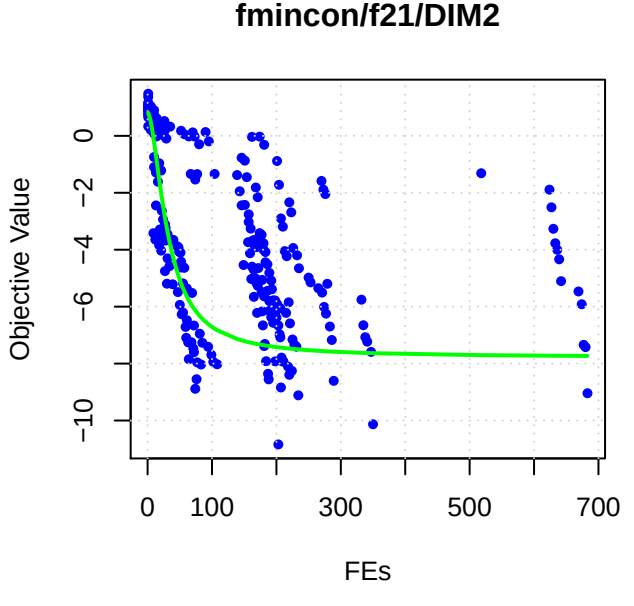
50000
100000
150000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Objective Value
FEs
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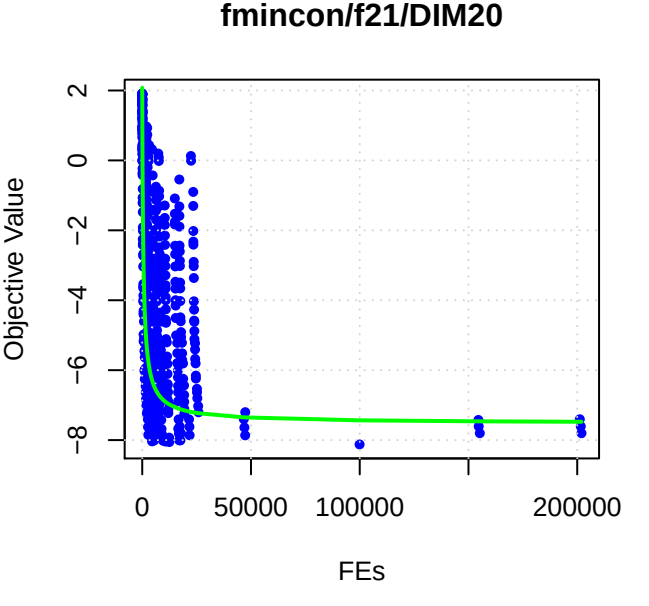
−2
−4
−6
−10
0
100
300
500
700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Objective Value
FEs
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−4
−6
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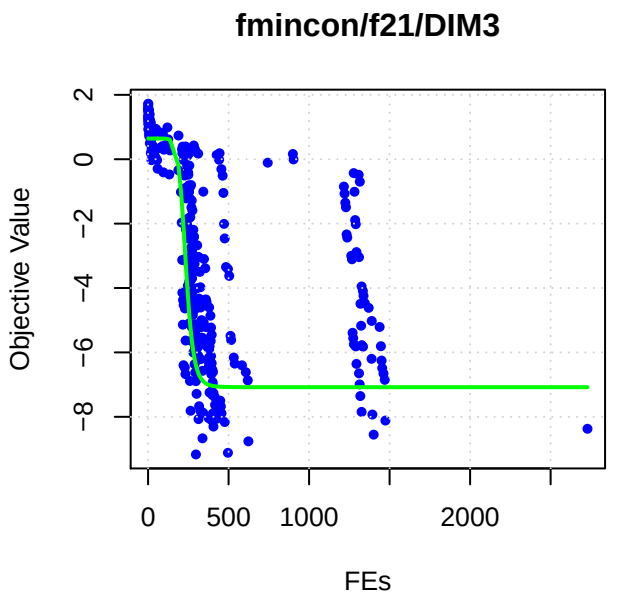
100000
200000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Objective Value
FEs
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−4
−6
−8
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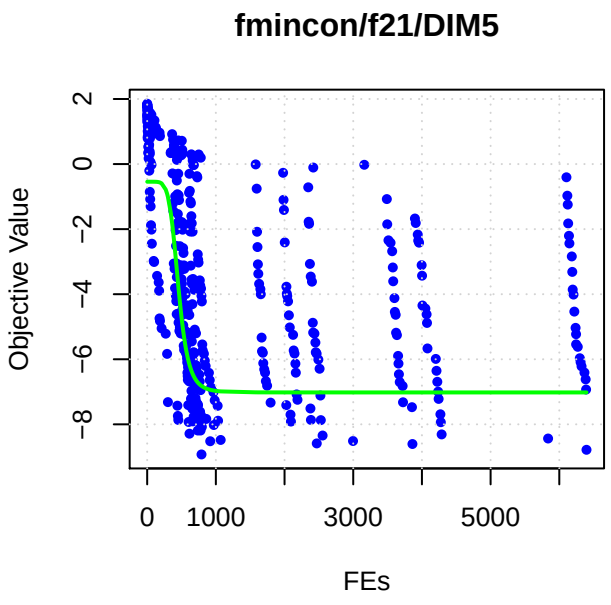
1000
2000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Objective Value
FEs
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−4
−6
−8
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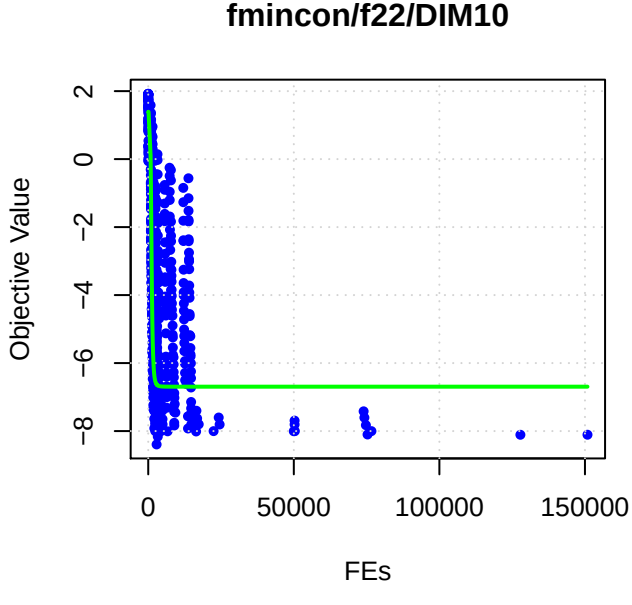
1000
3000
5000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Objective Value
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−4
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−8
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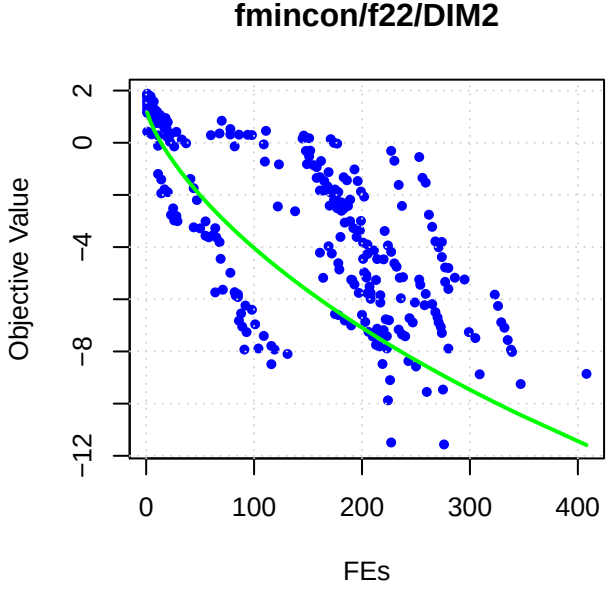
100000
150000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Objective Value
FEs
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300
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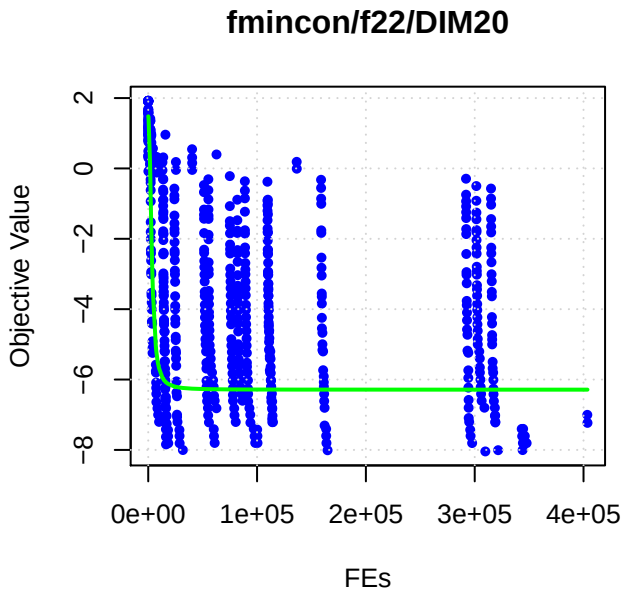
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Objective Value
FEs
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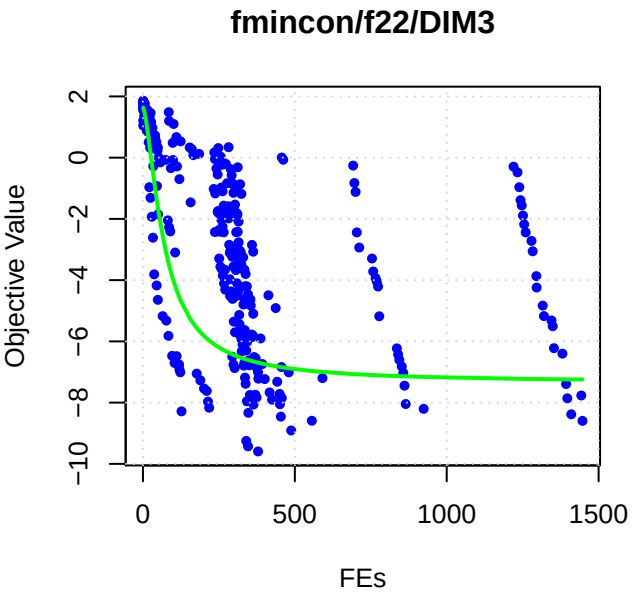
1e+05
2e+05
3e+05
4e+05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Objective Value
FEs
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−6
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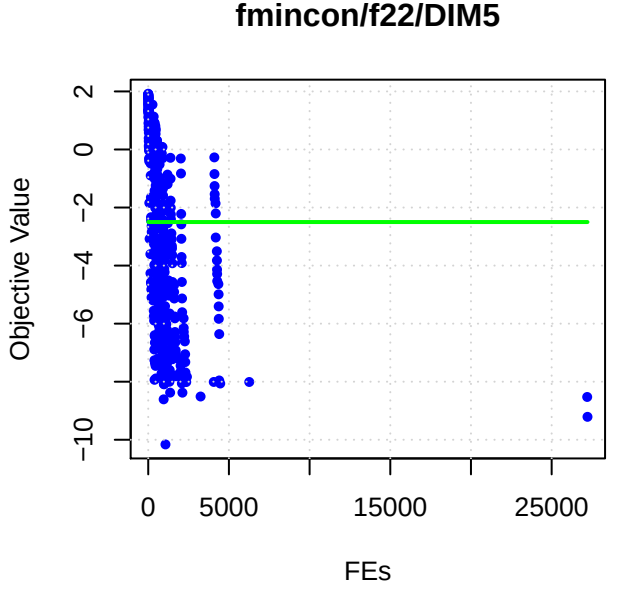
500
1000
1500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Objective Value
FEs
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−6
−10
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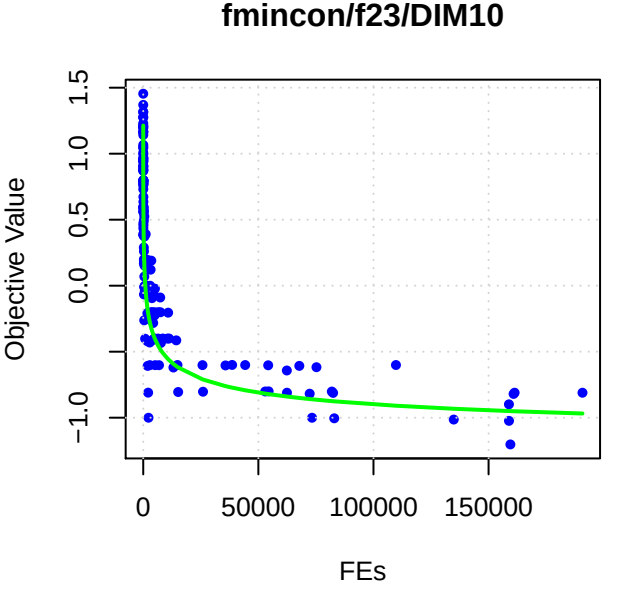
5000
15000
25000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Objective Value
FEs
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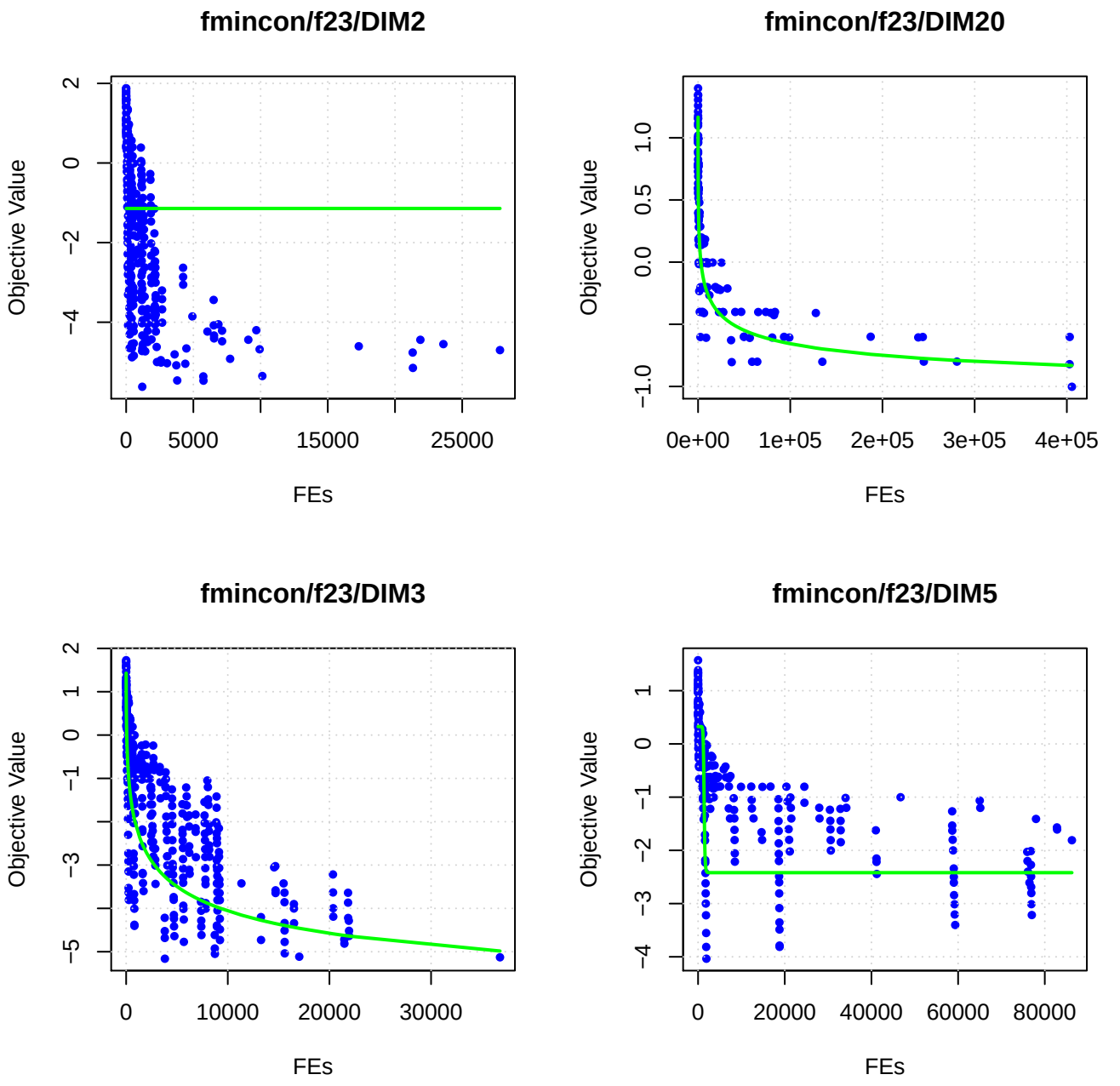
50000
100000
150000


fmincon/f23/DIM2
Objective Value
FEs
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−2
−4
0
5000
15000
25000
fmincon/f23/DIM20
Objective Value
FEs
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0.5
0.0
−1.0
0e+00
1e+05
2e+05
3e+05
4e+05
fmincon/f23/DIM3
Objective Value
FEs
2
1
0
−1
−3
−5
0
10000
20000
30000
fmincon/f23/DIM5
Objective Value
FEs
1
0
−1
−2
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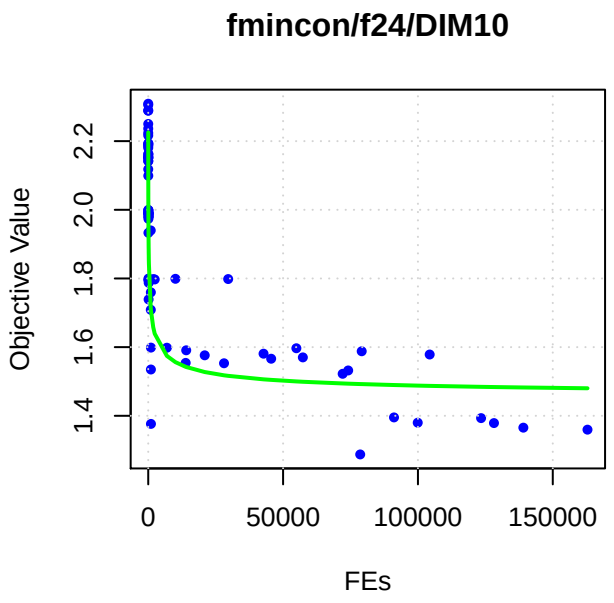
40000
60000
80000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Objective Value
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1.6
1.8
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2.2
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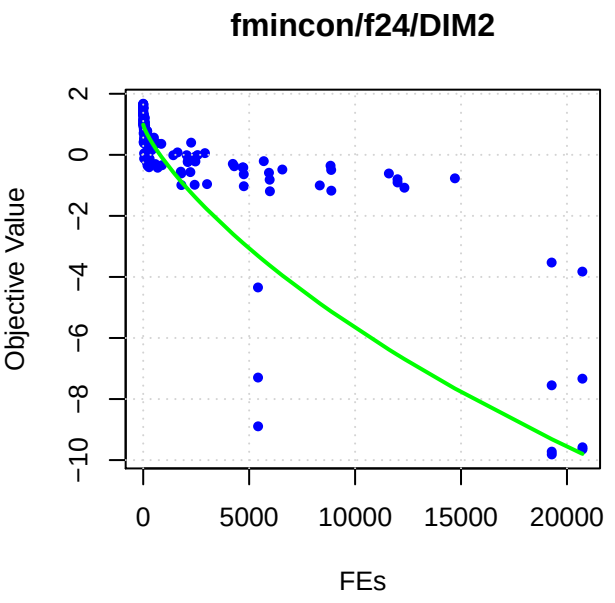
50000
100000
150000
FEs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−4
−2
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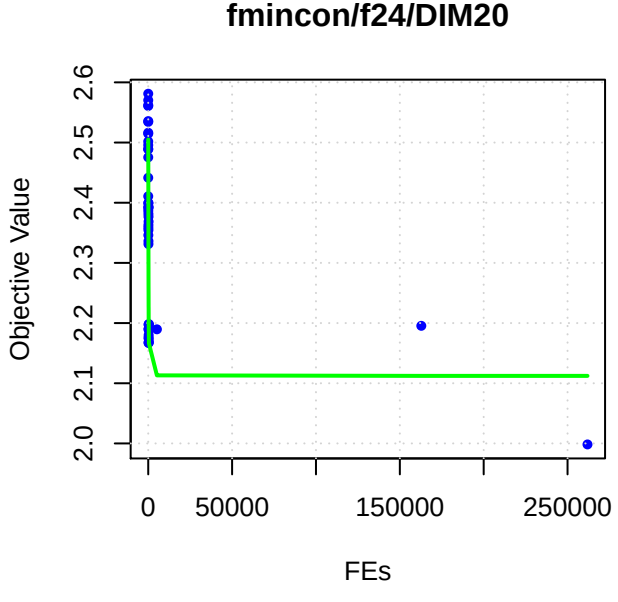
2
0
5000
10000
15000
20000
FEs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Objective Value
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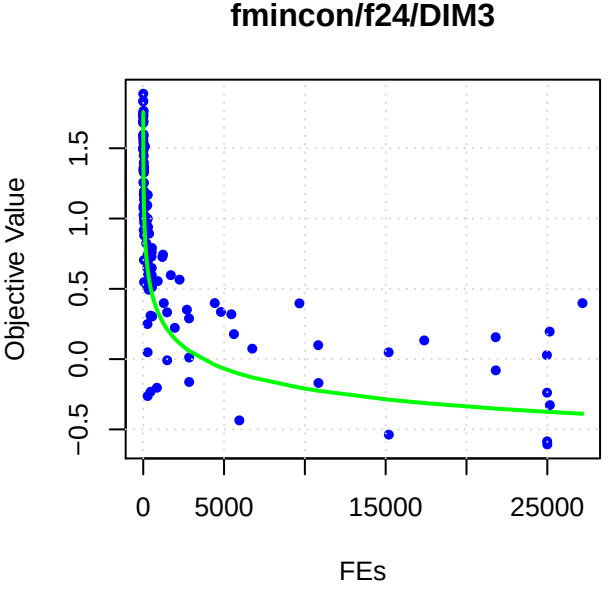
2.2
2.3
2.4
2.5
2.6
0
50000
150000
250000
FEs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Objective Value
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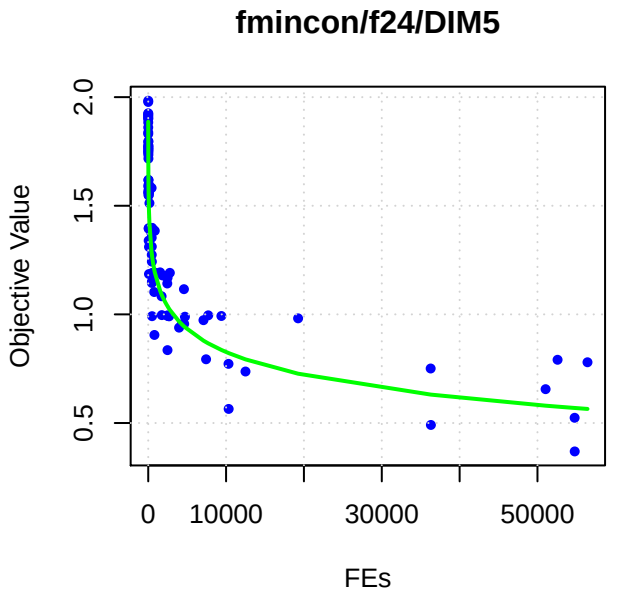
0.5
1.0
1.5
0
5000
15000
25000
FEs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Objective Value
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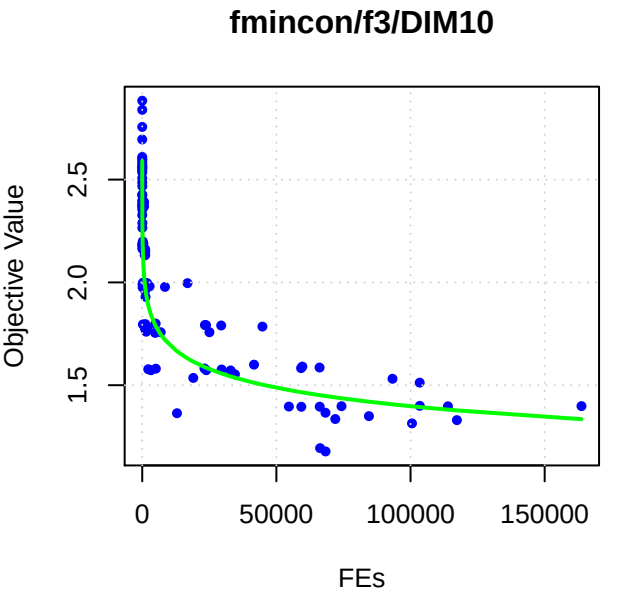
1.0
1.5
2.0
0
10000
30000
50000
FEs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Objective Value
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2.5
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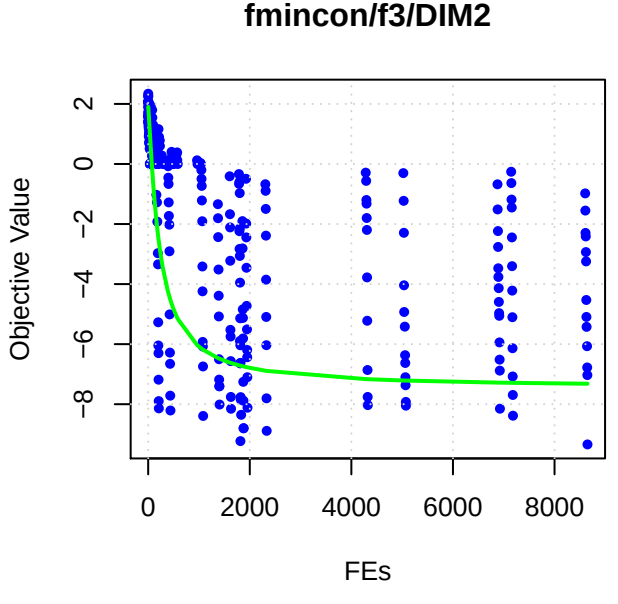
50000
100000
150000
FEs


fmincon/f3/DIM2
Objective Value
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−4
−2
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2
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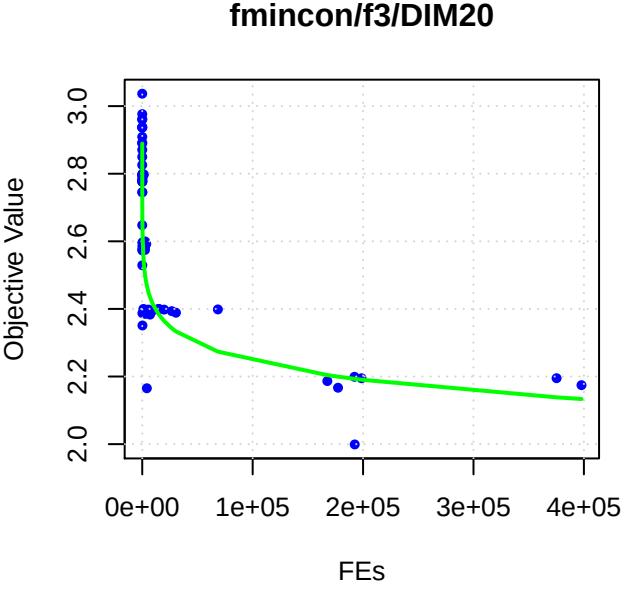
2000
4000
6000
8000
FEs


fmincon/f3/DIM20
Objective Value
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2.6
2.8
3.0
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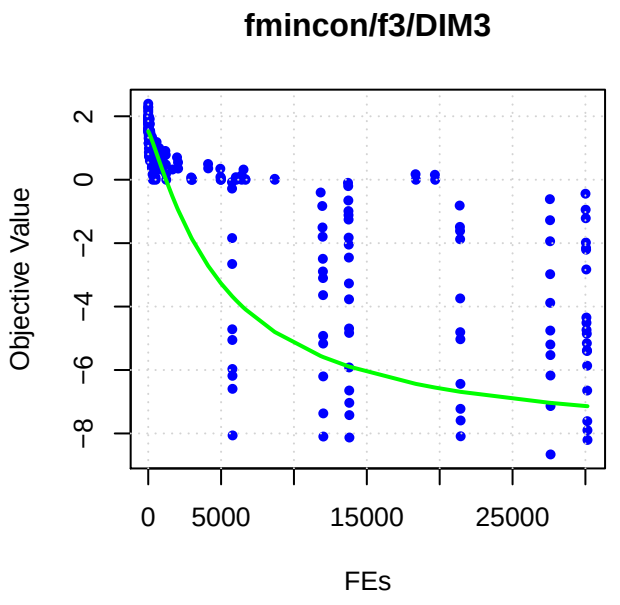
1e+05
2e+05
3e+05
4e+05
FEs


fmincon/f3/DIM3
Objective Value
FEs
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−2
−4
−6
−8
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5000
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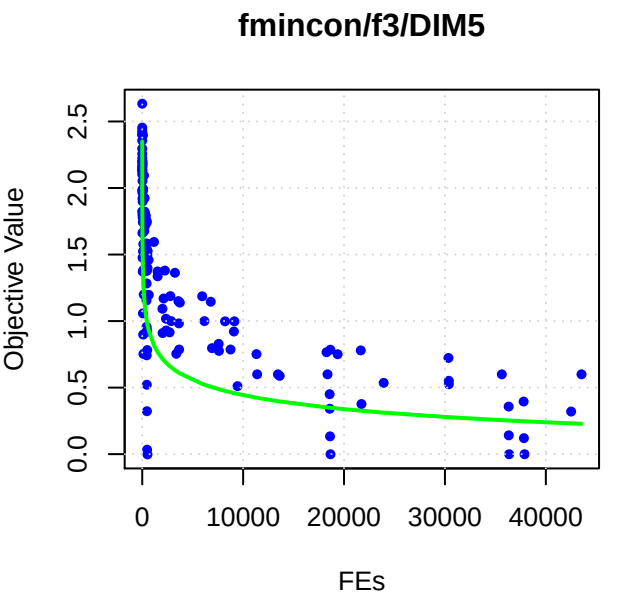
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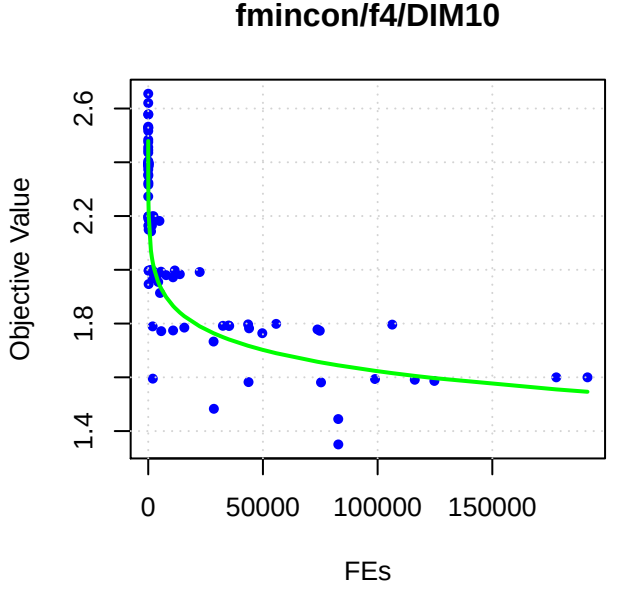
30000
40000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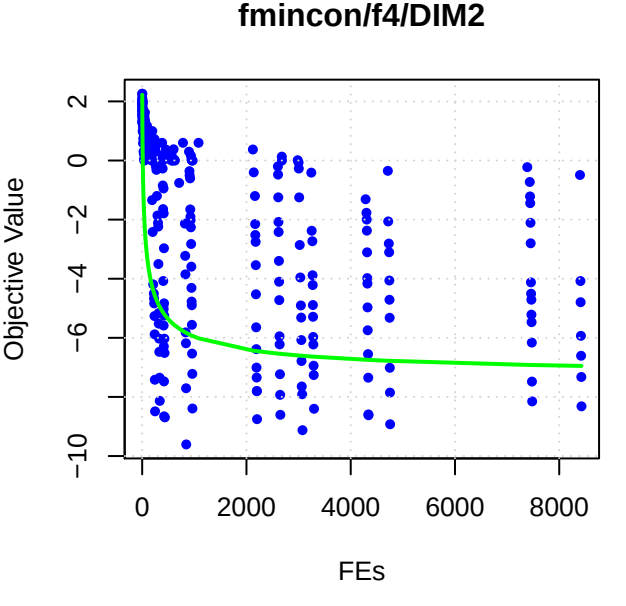
100000
150000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Objective Value
FEs
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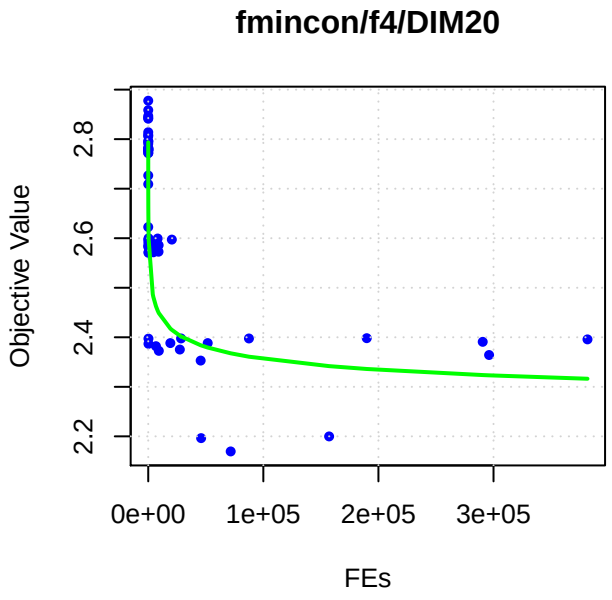
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2.8
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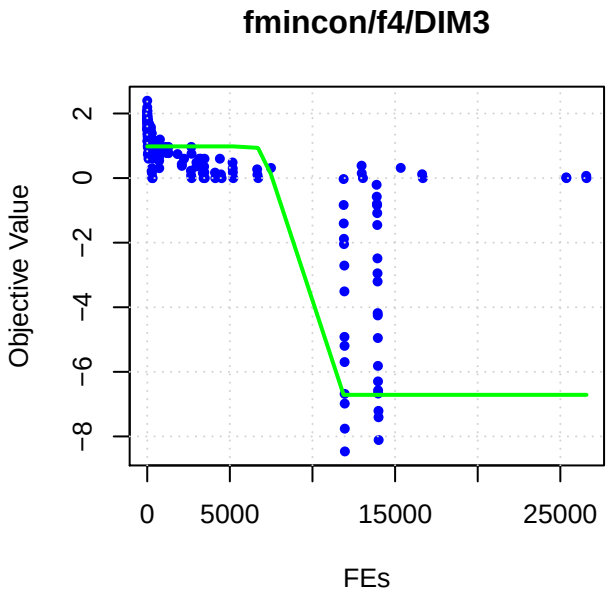
2e+05
3e+05
FEs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15000
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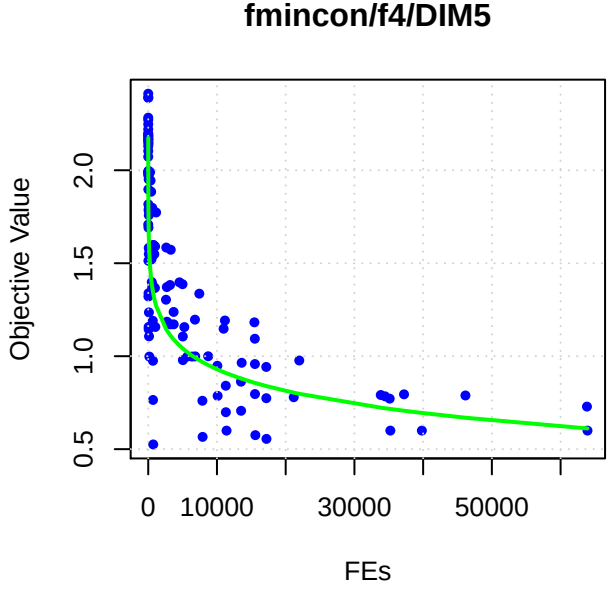
FEs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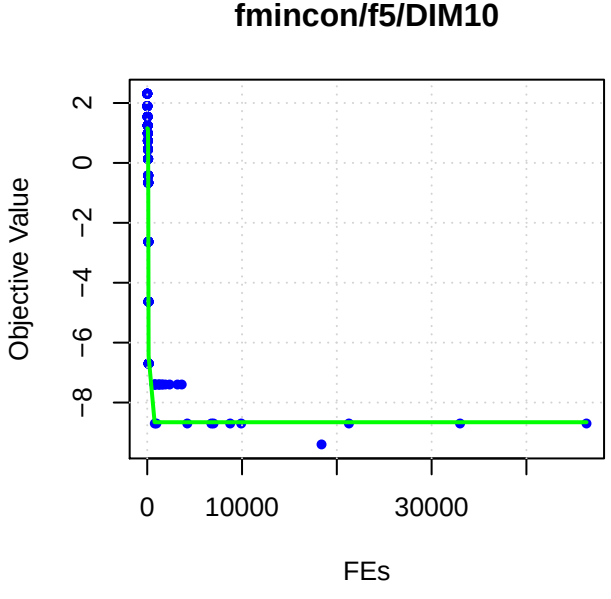
FEs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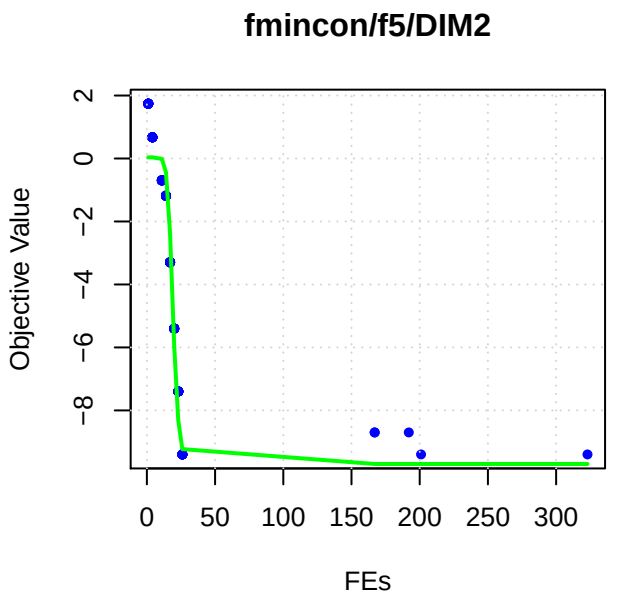
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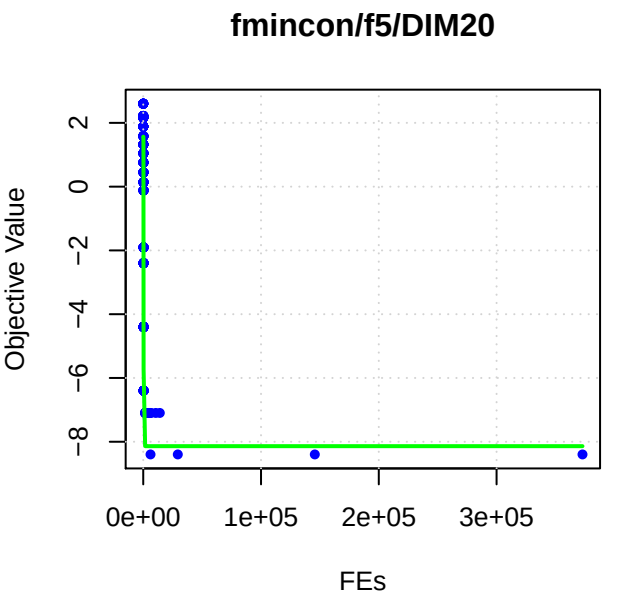
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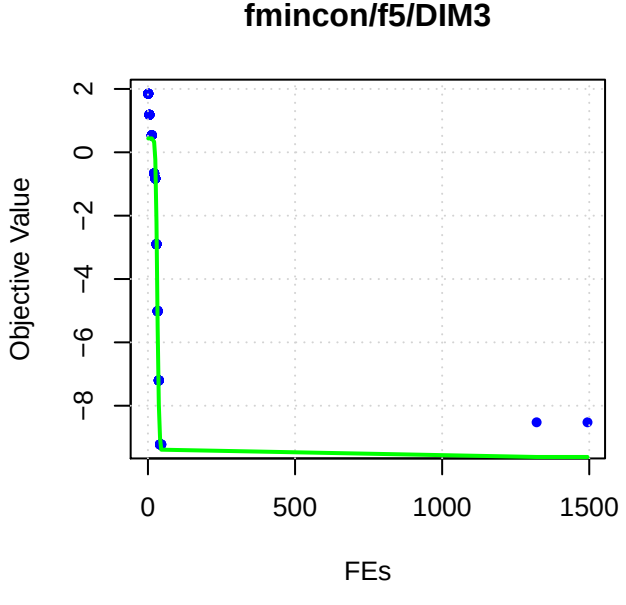
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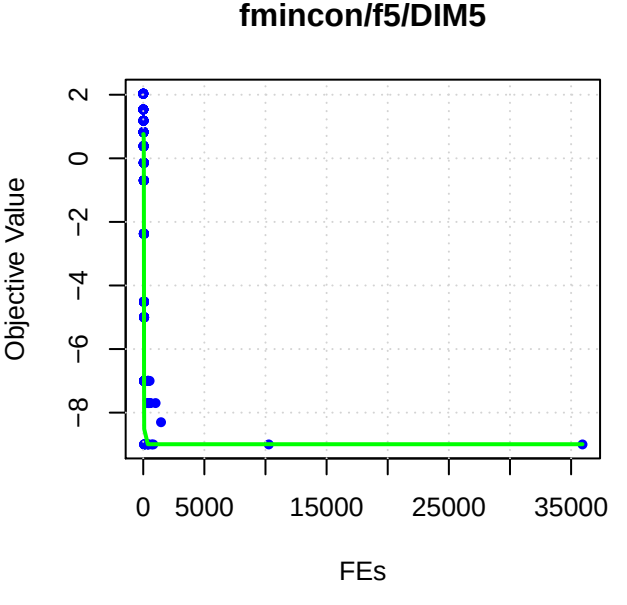
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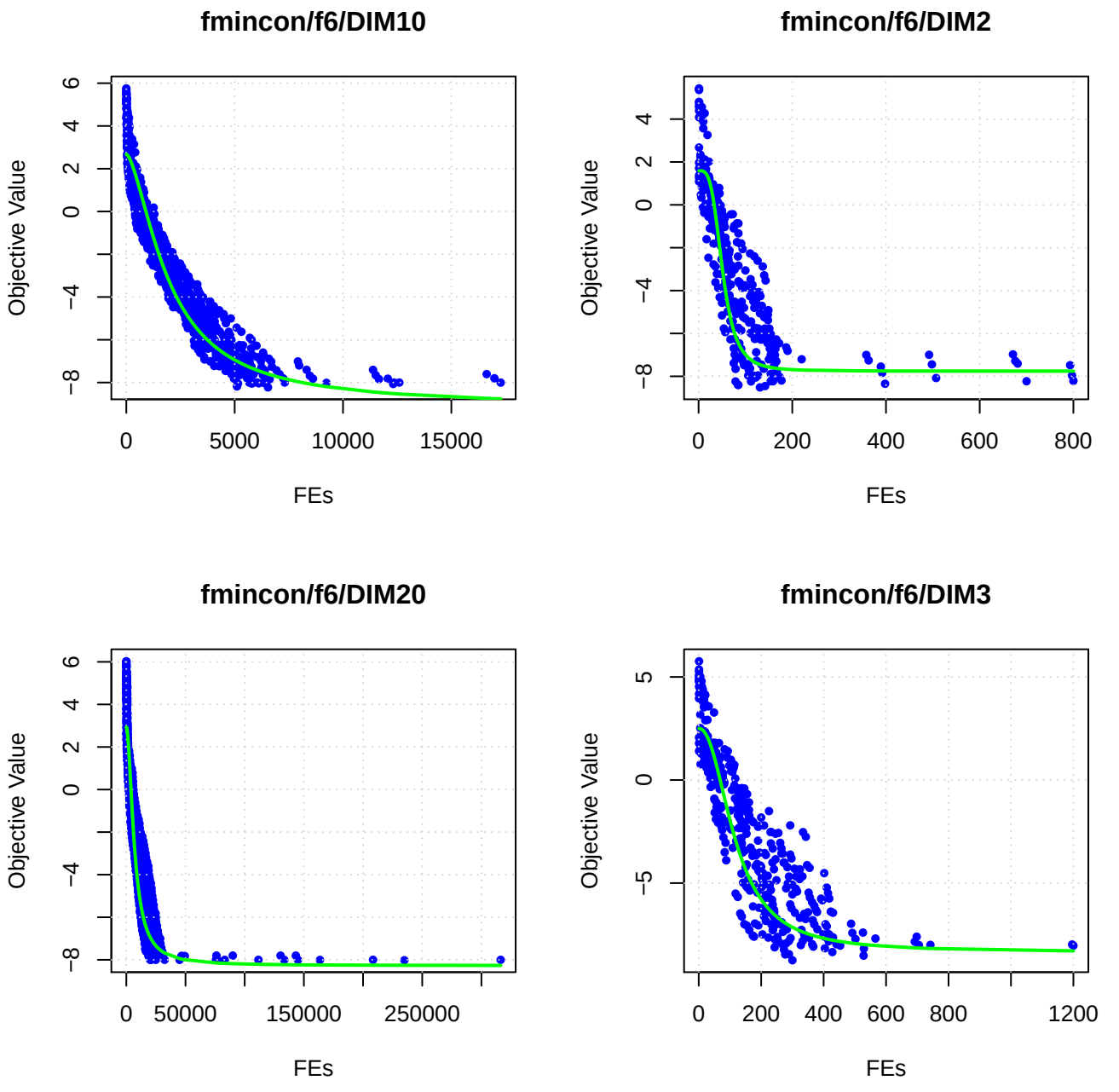
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Objective Value
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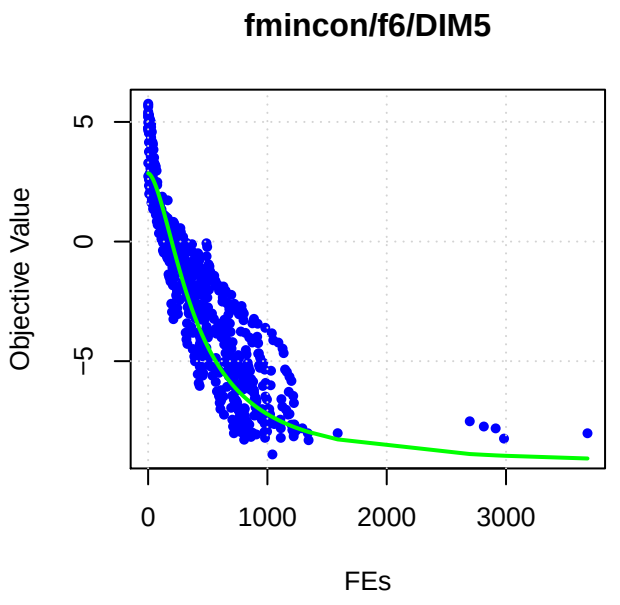
Objective Value
FEs
fmincon/f6/DIM20
Objective Value
FEs
fmincon/f6/DIM3
Objective Value
FEs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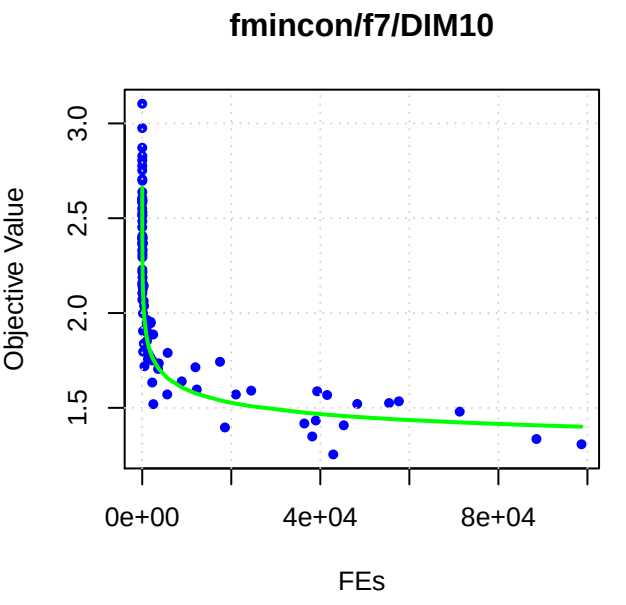
FEs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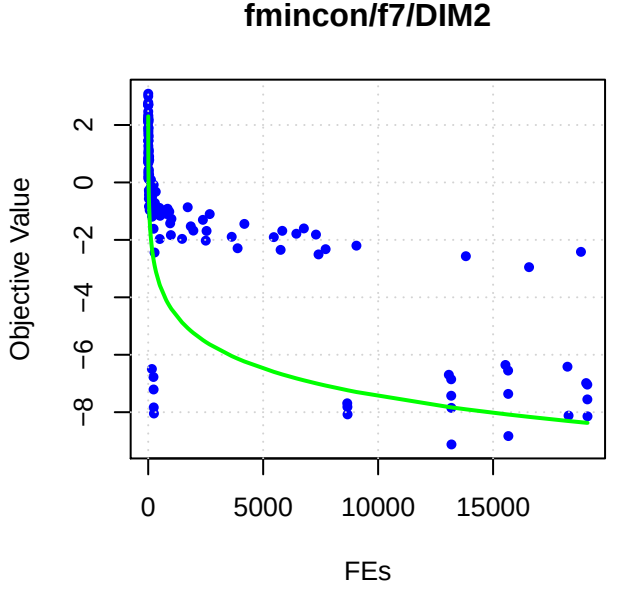
FEs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Objective Value
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−6
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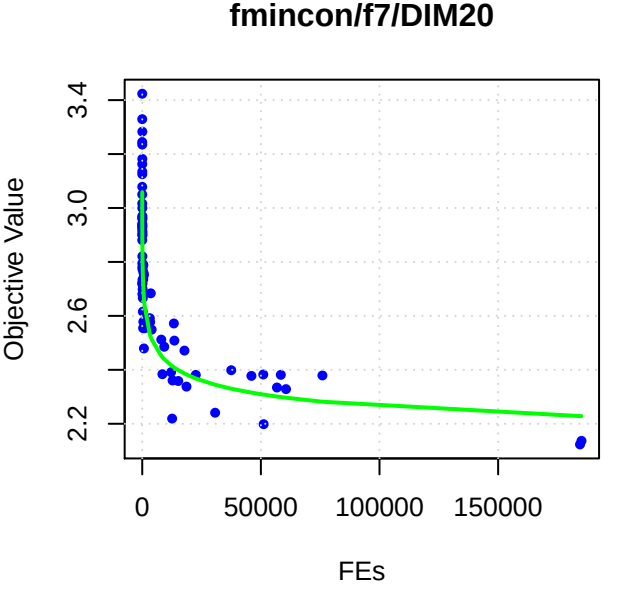
5000
10000
15000
FEs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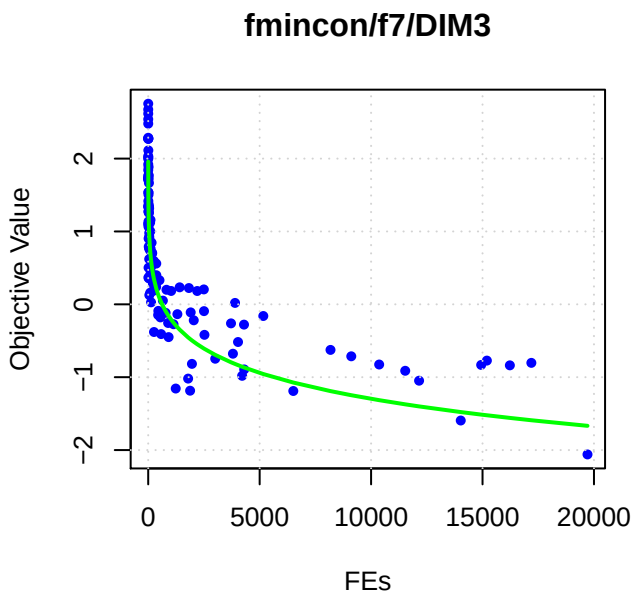
150000
FEs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Objective Value
FEs
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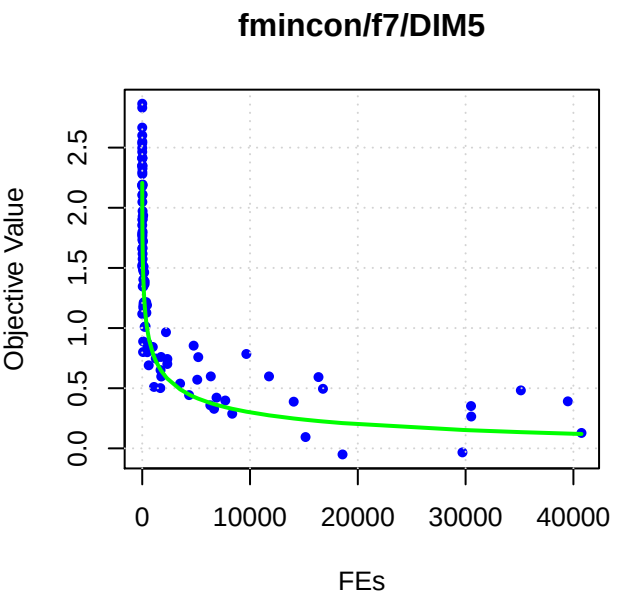
10000
15000
20000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Objective Value
FEs
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1.5
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0.0
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10000
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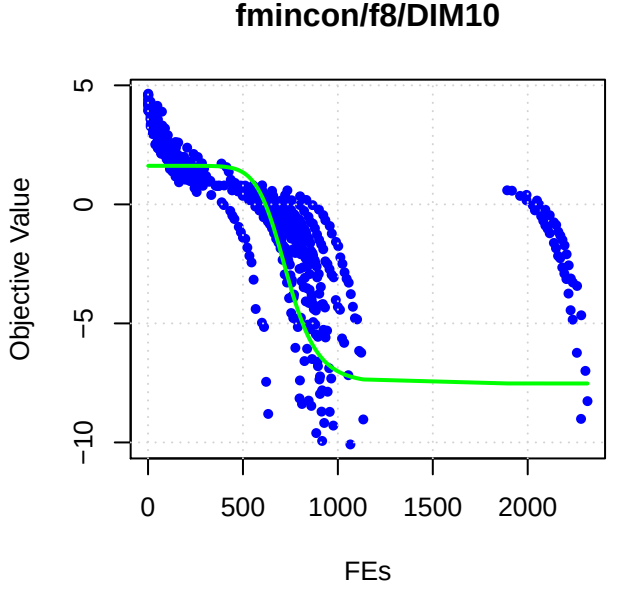
30000
40000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Objective Value
FEs
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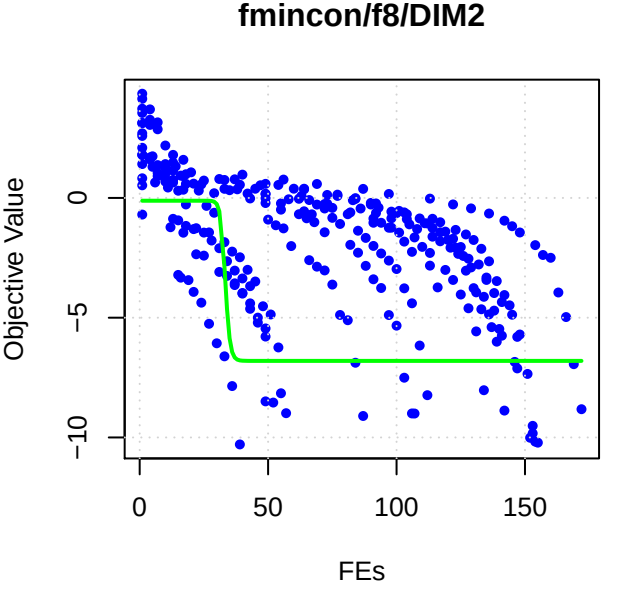
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Objective Value
FEs
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100
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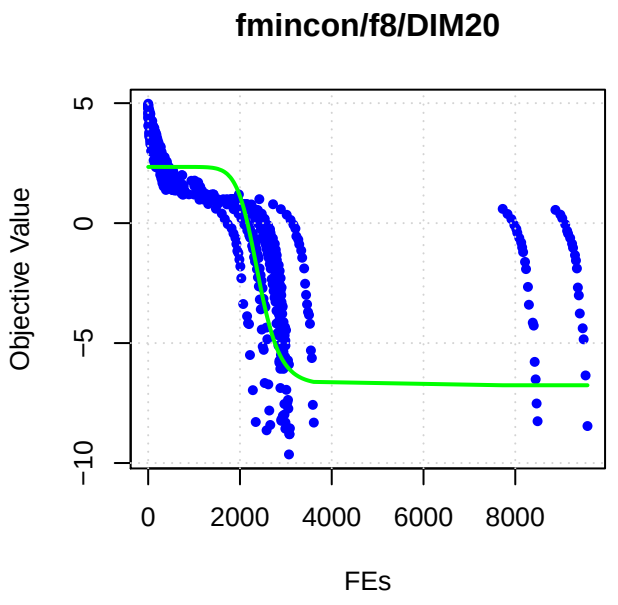
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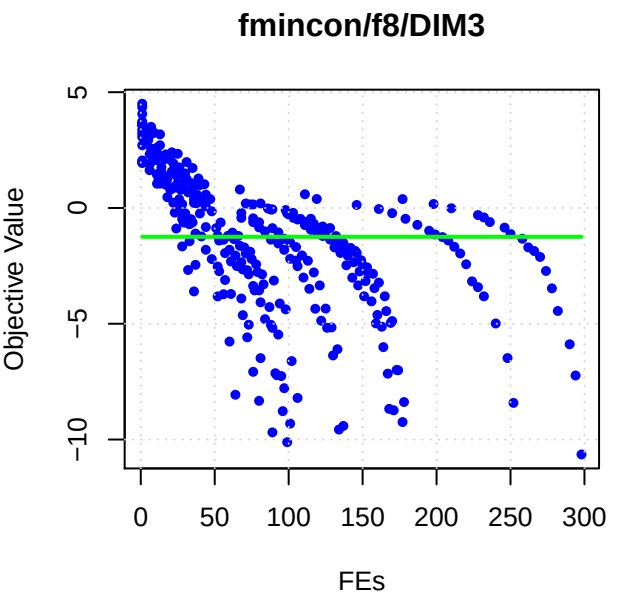
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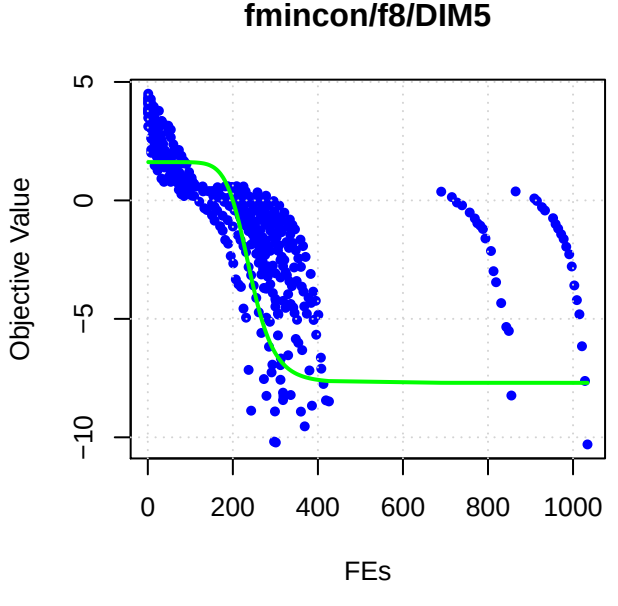
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Objective Value
FEs
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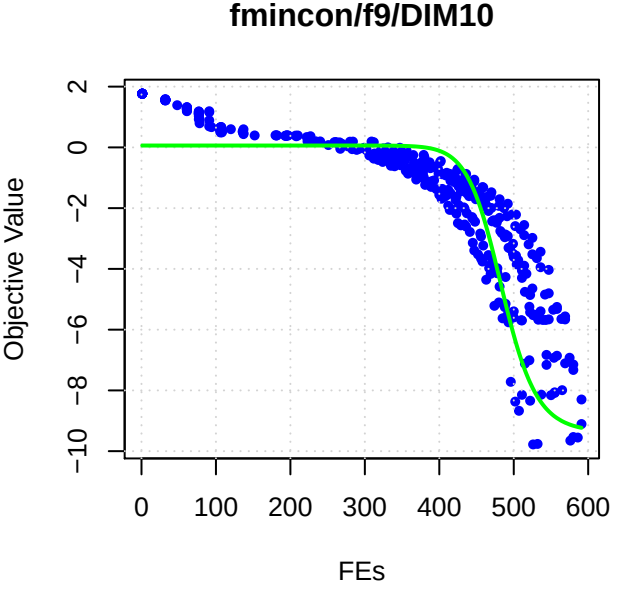
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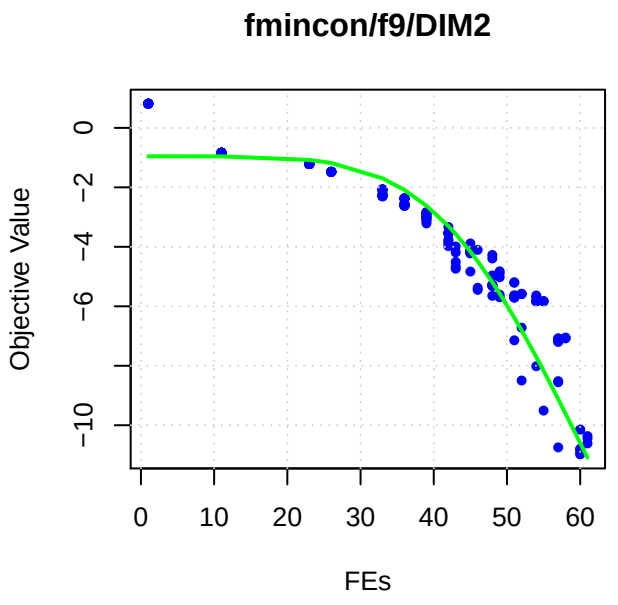
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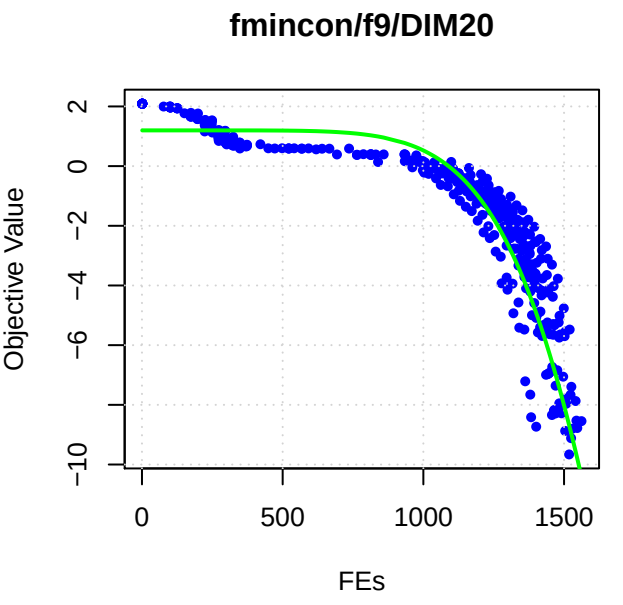
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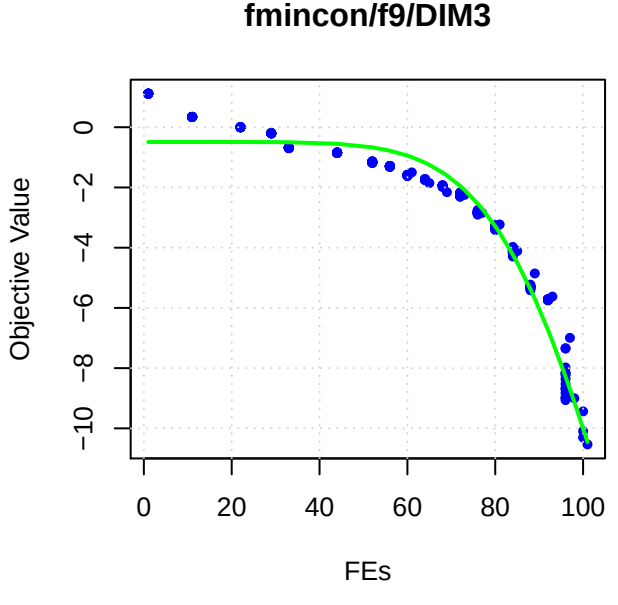
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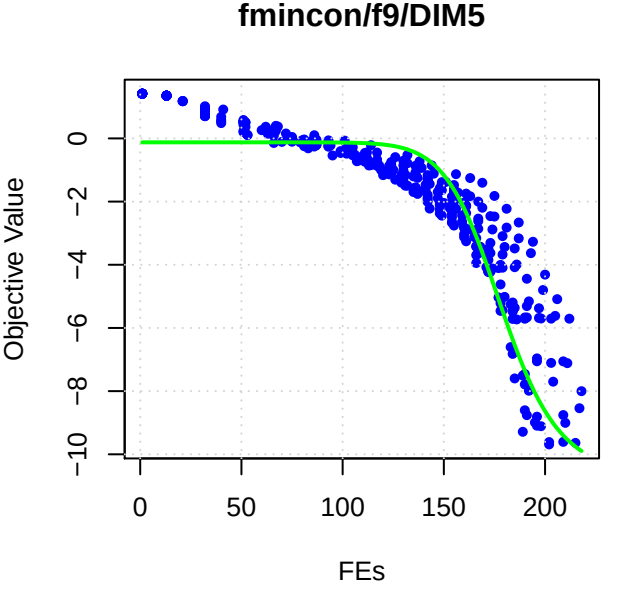
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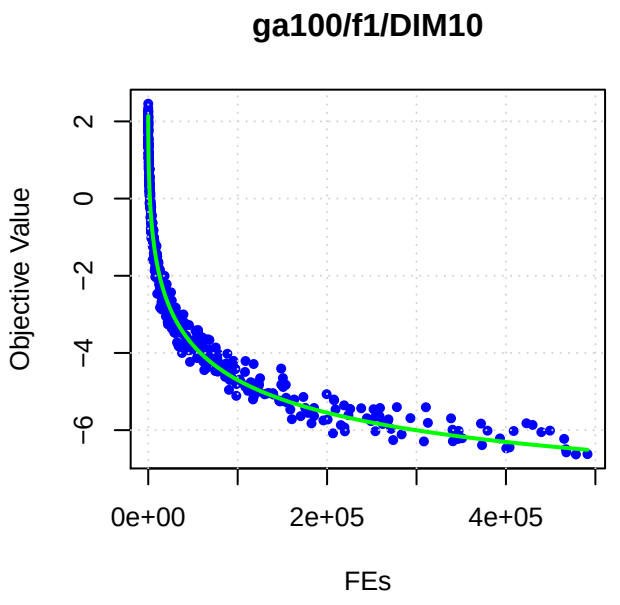
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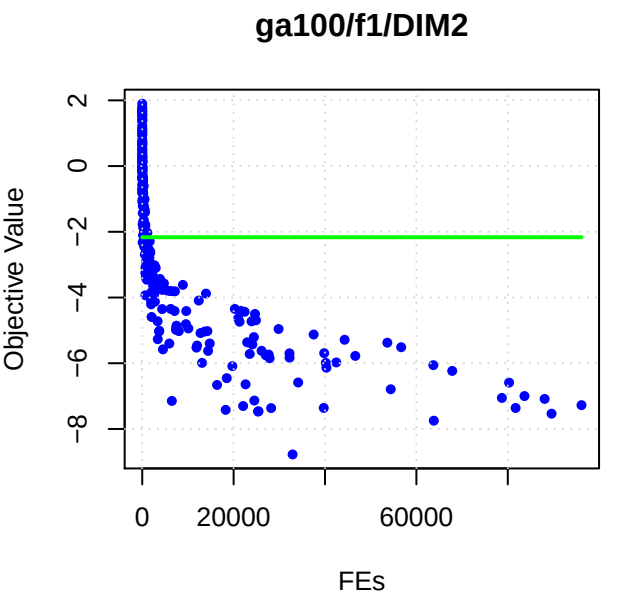
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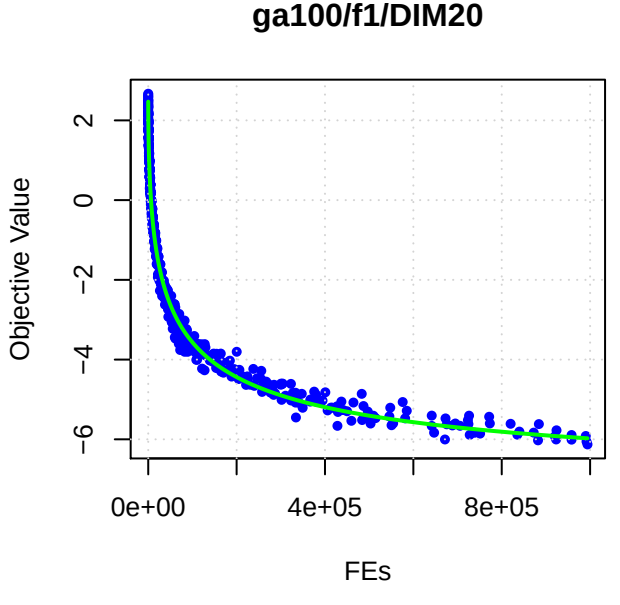
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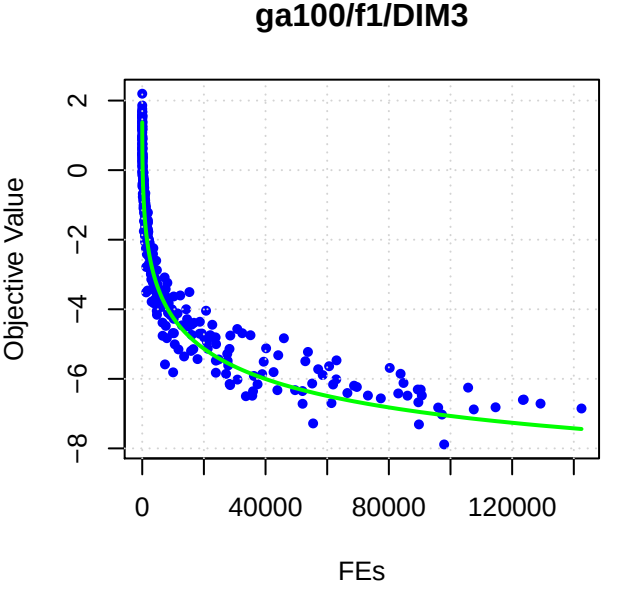
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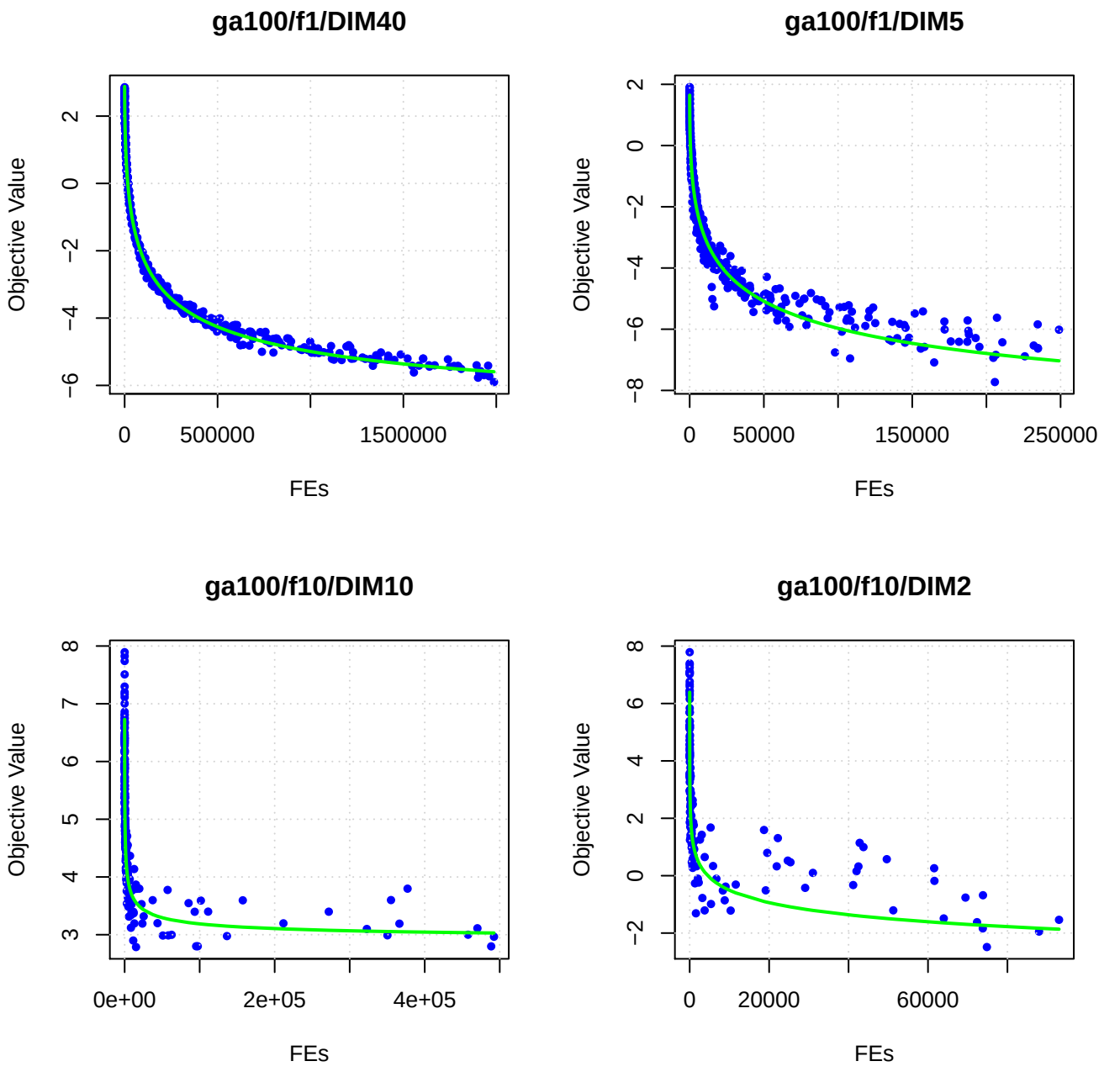
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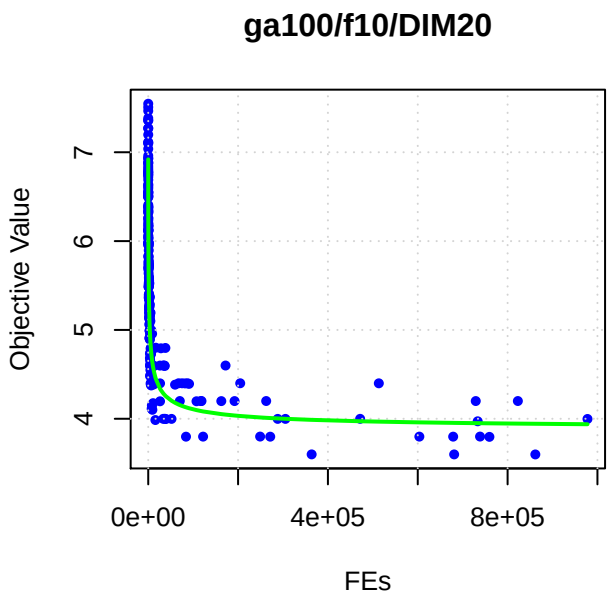
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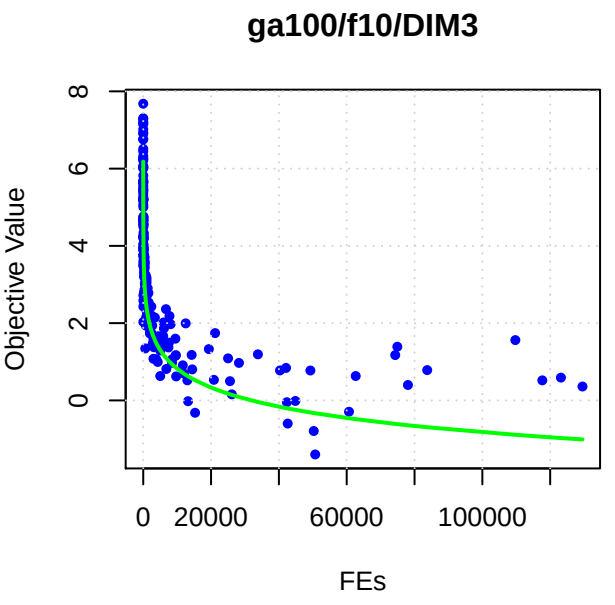
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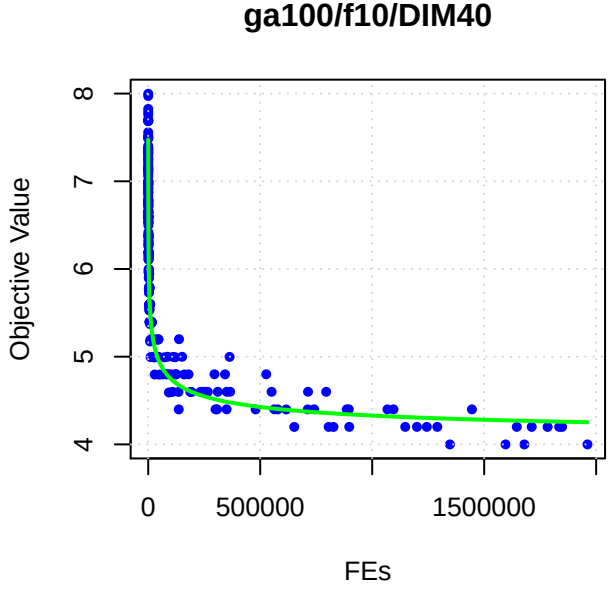
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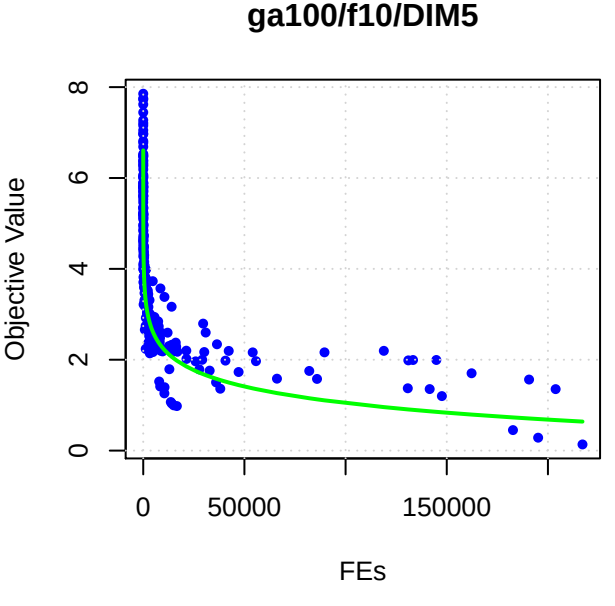
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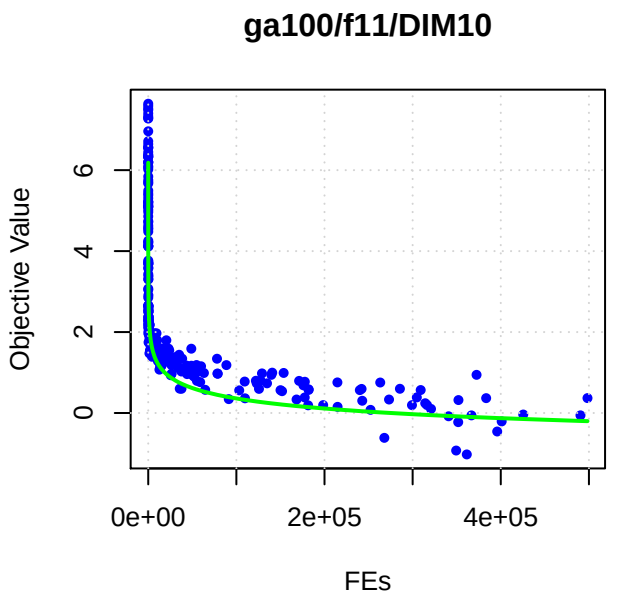
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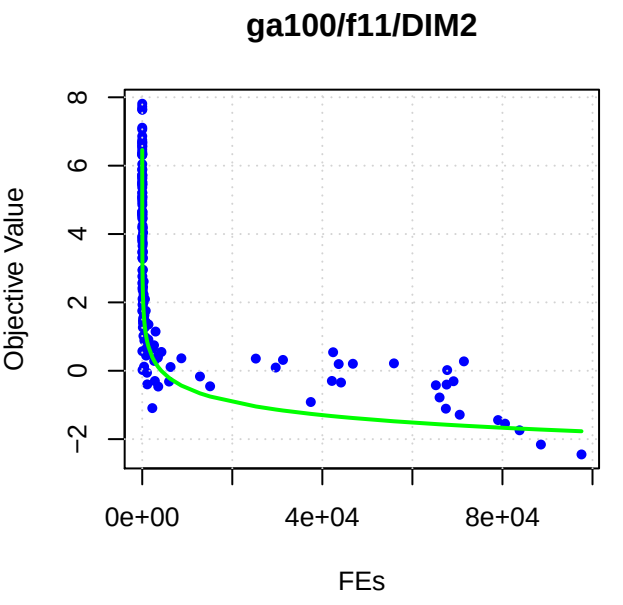
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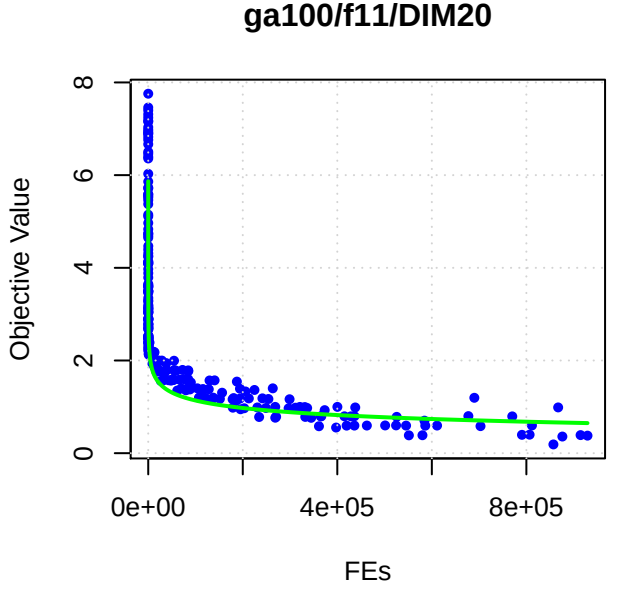
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Objective Value
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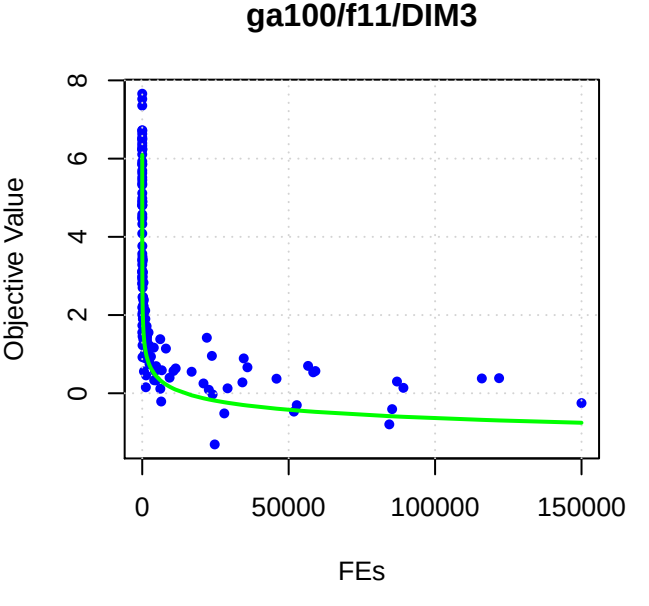
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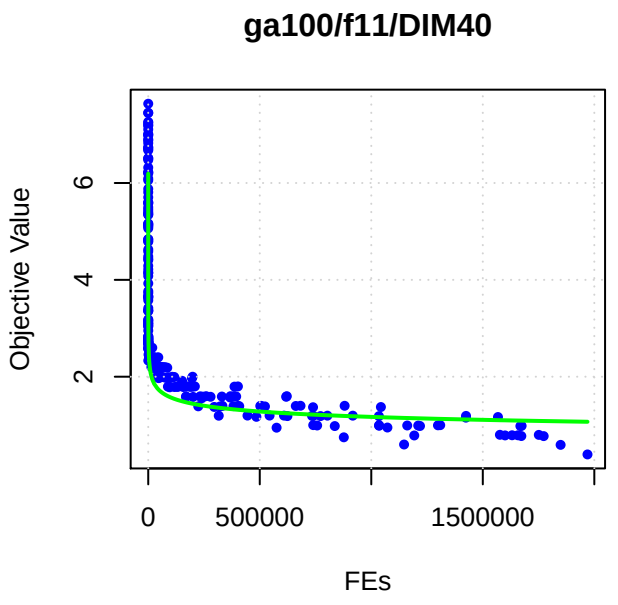
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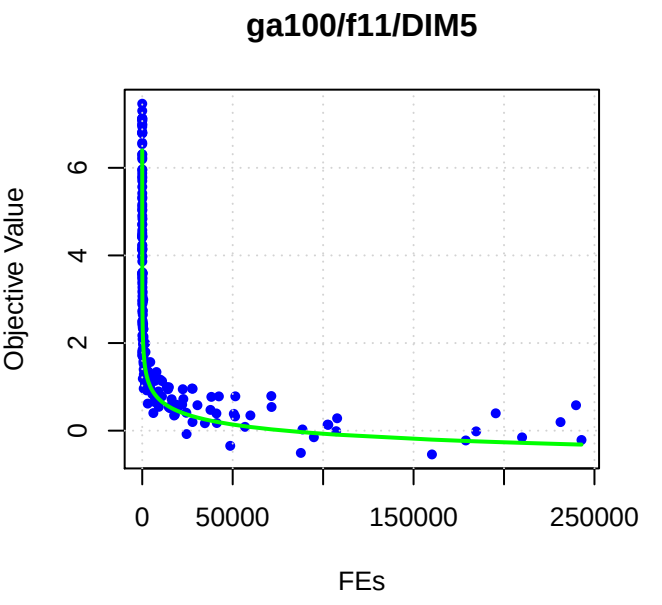
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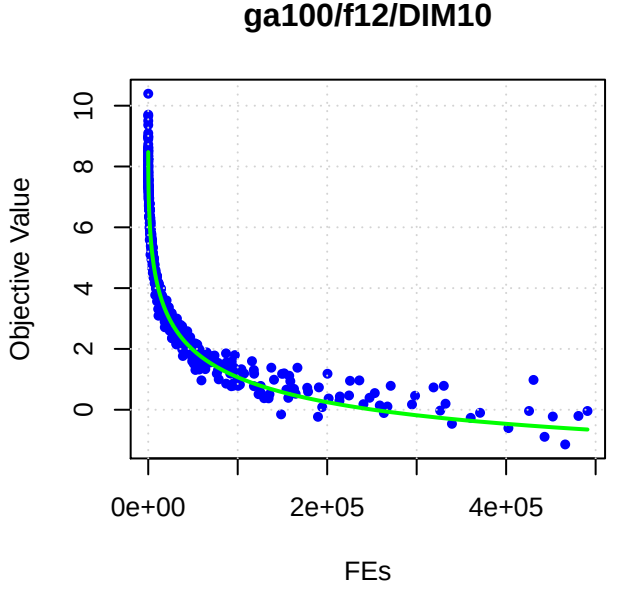
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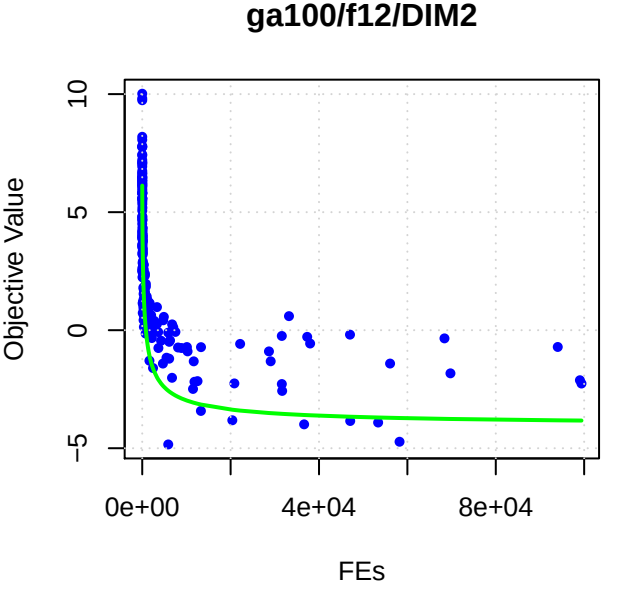
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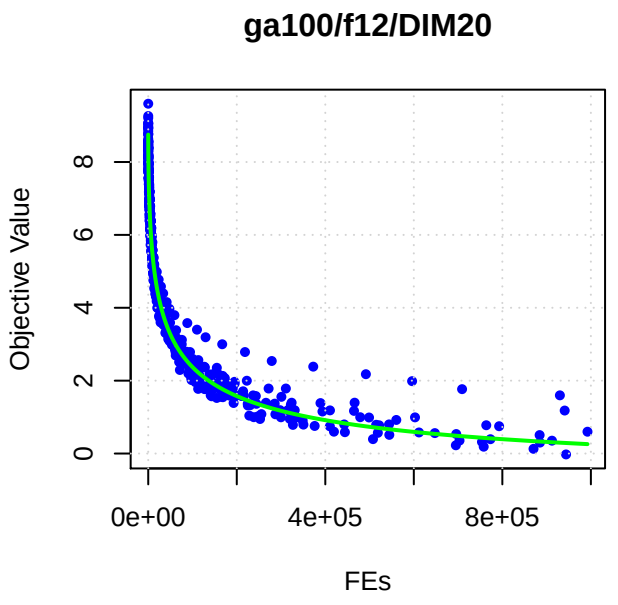
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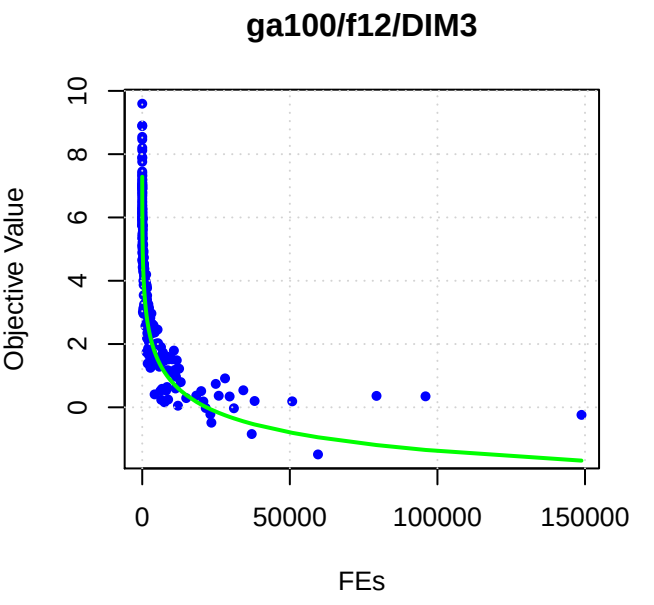
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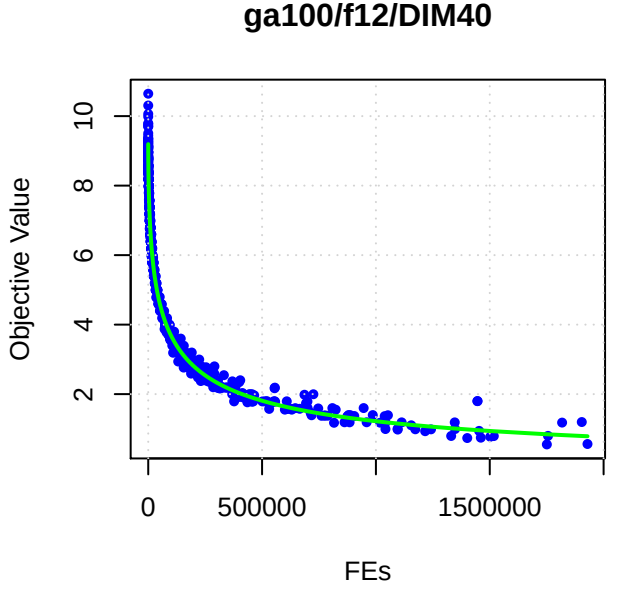
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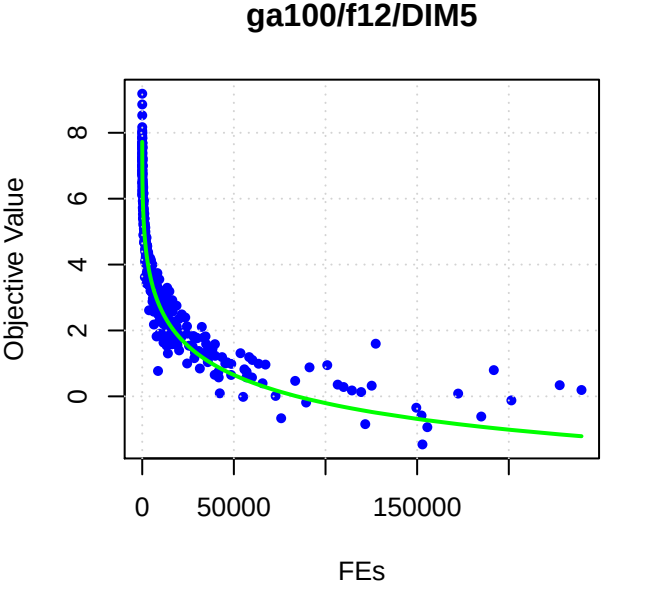
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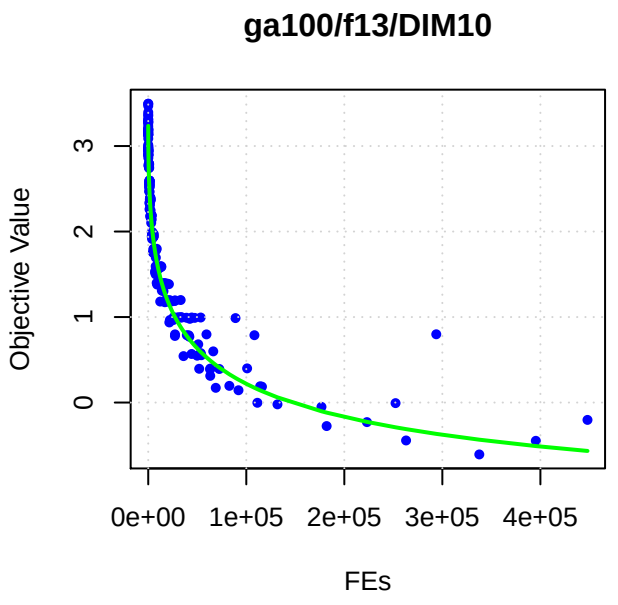
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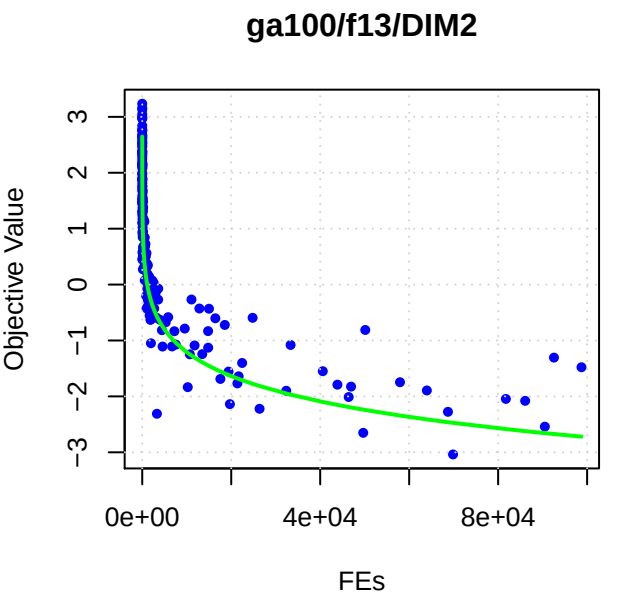
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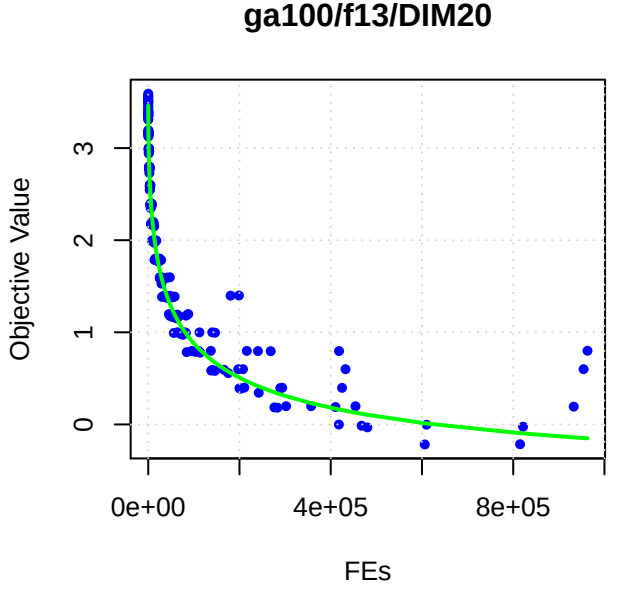
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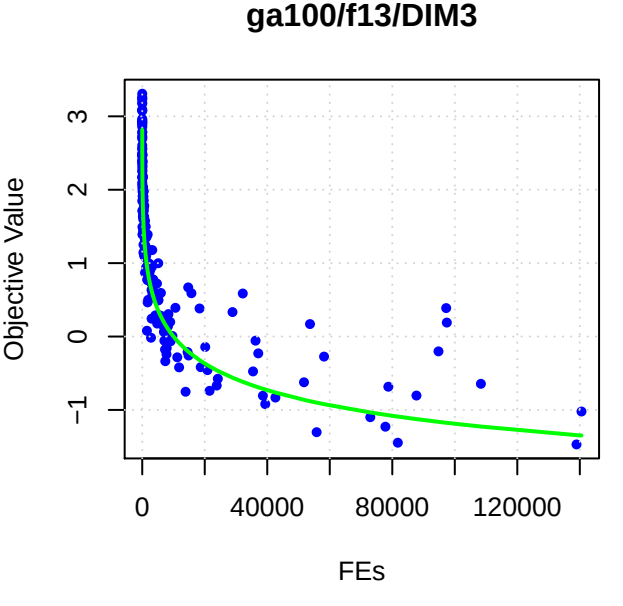
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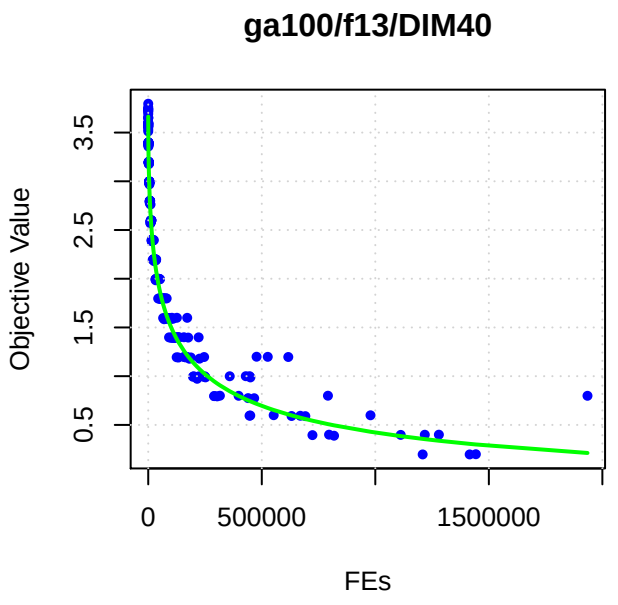
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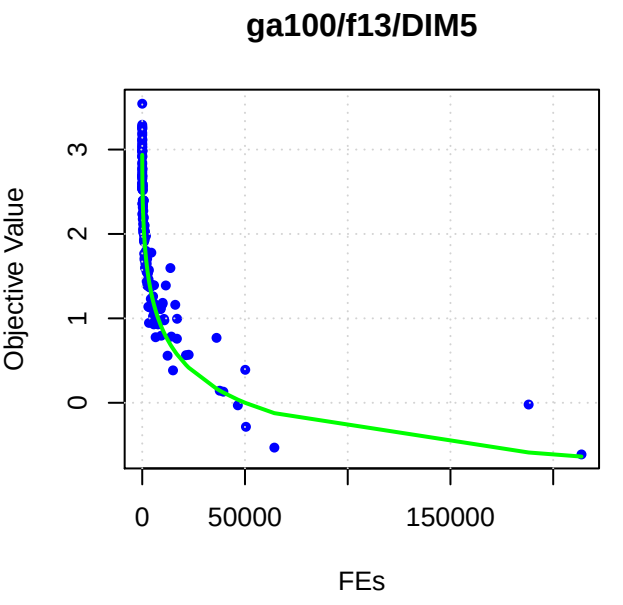
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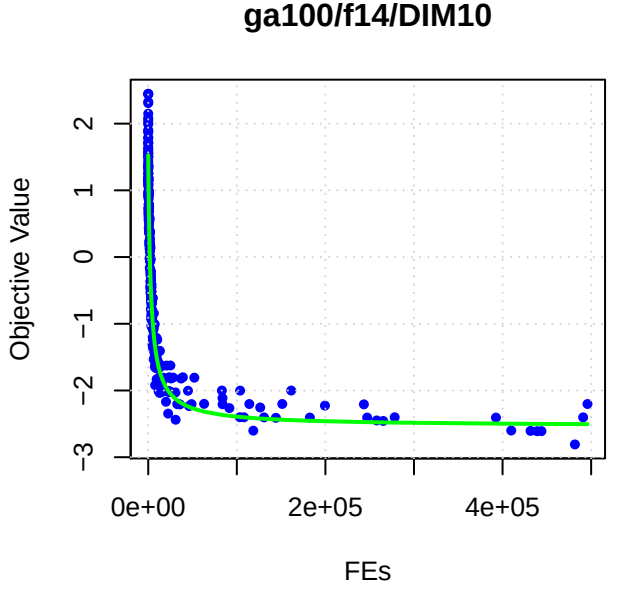
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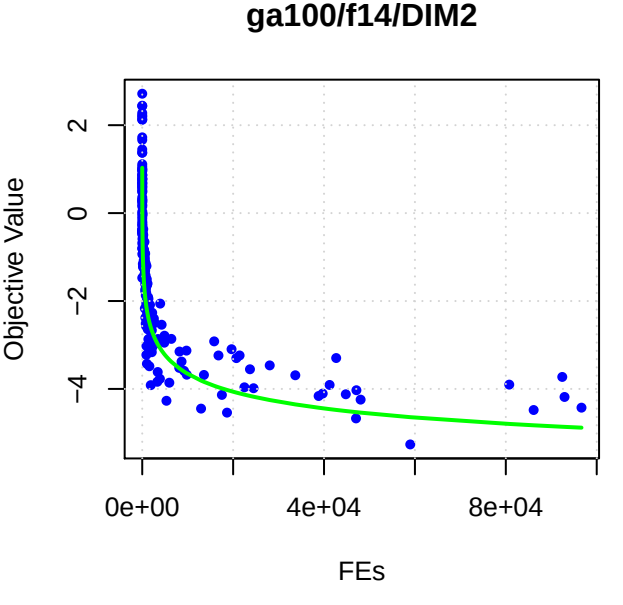
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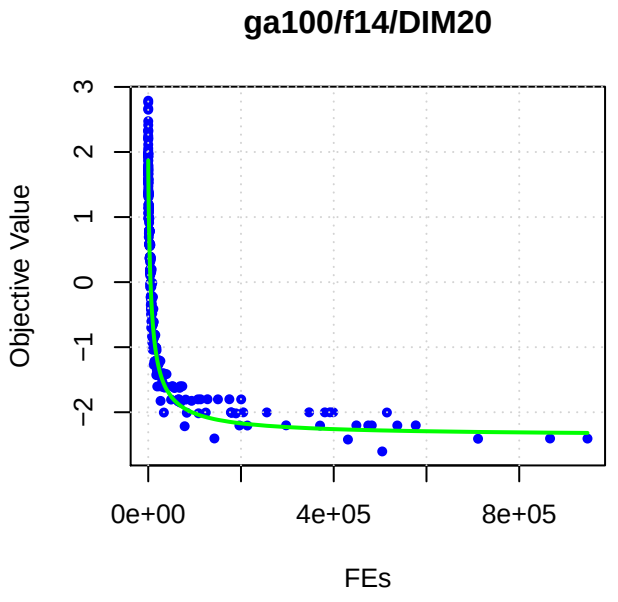
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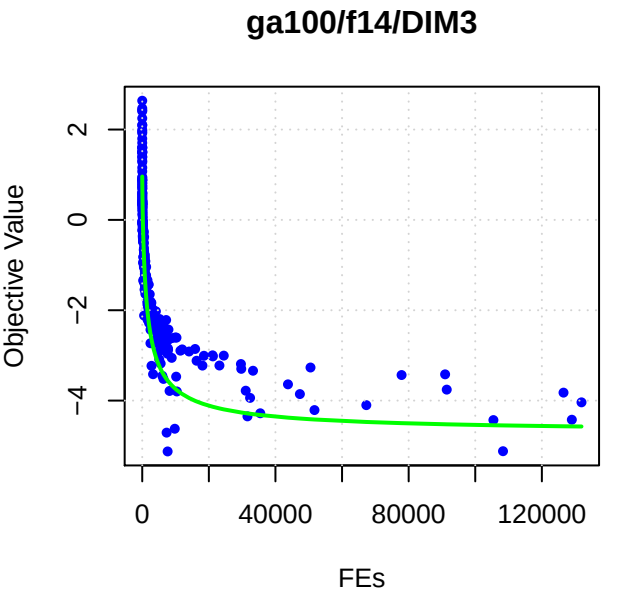
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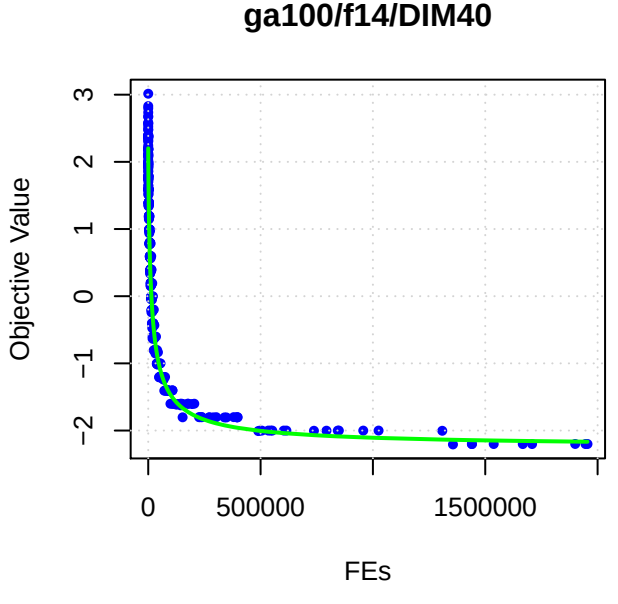
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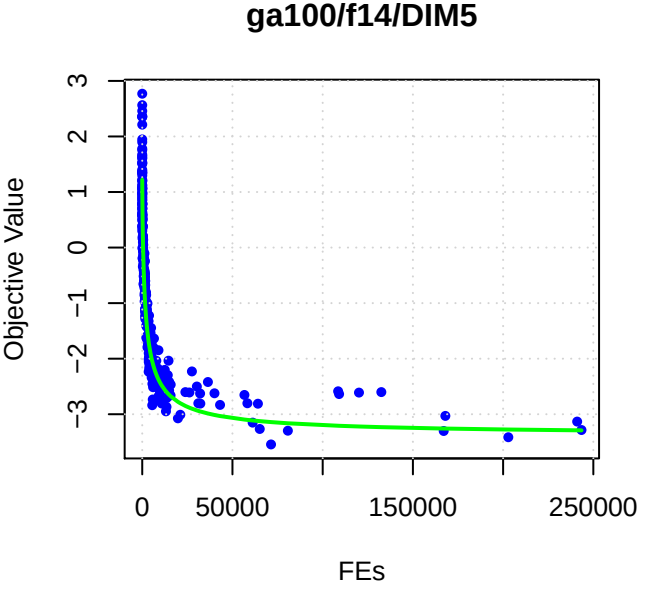
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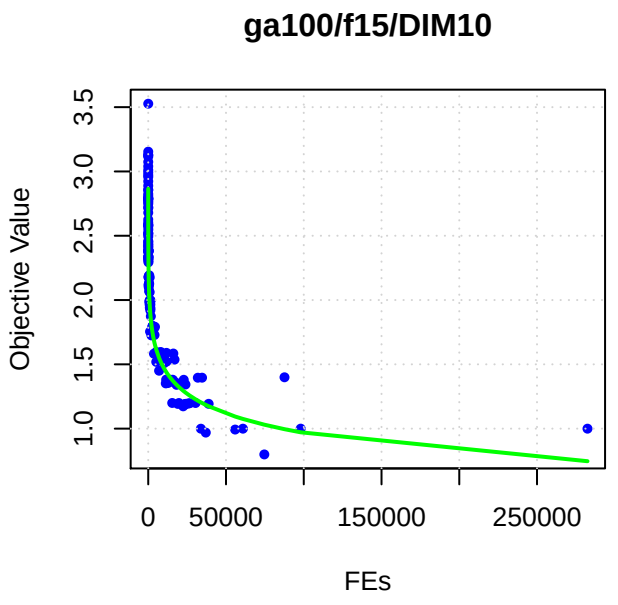
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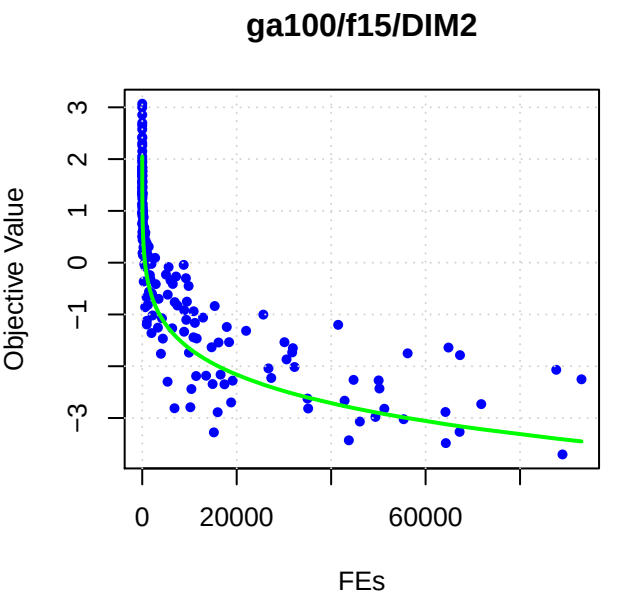
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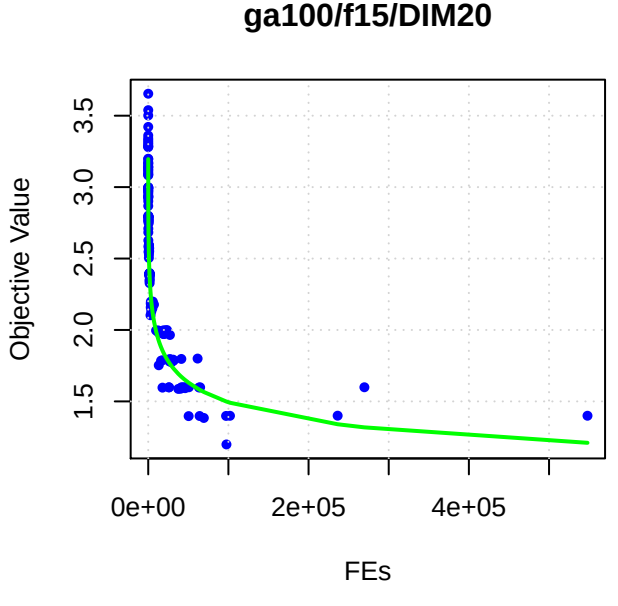
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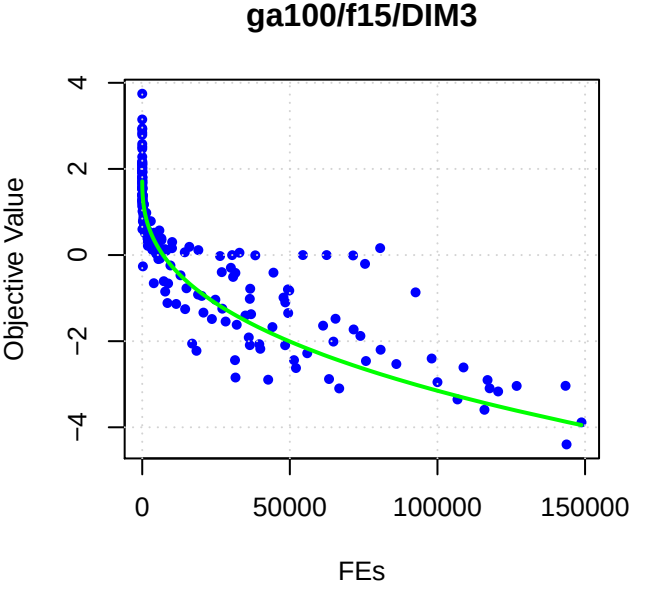
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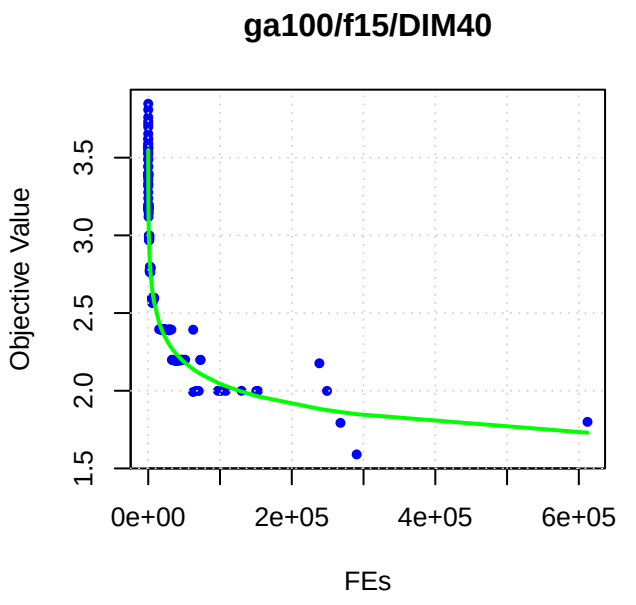
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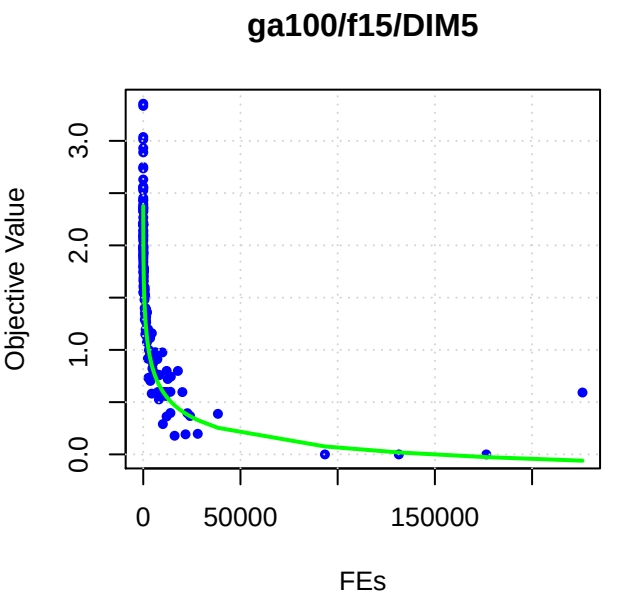
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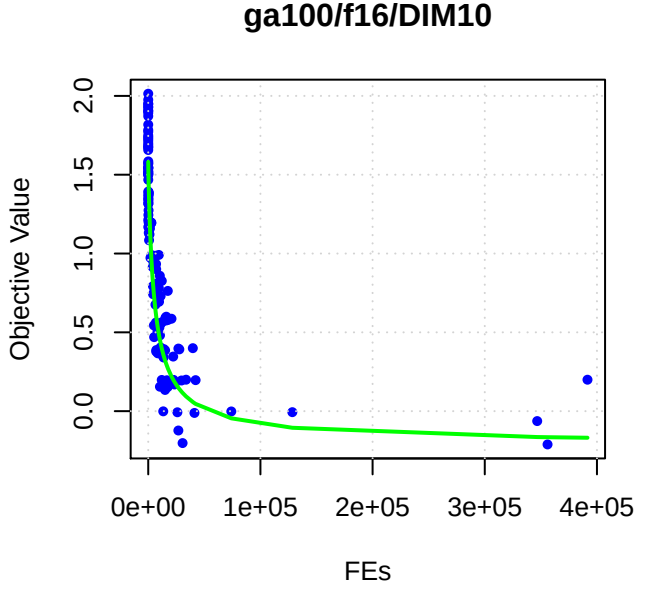
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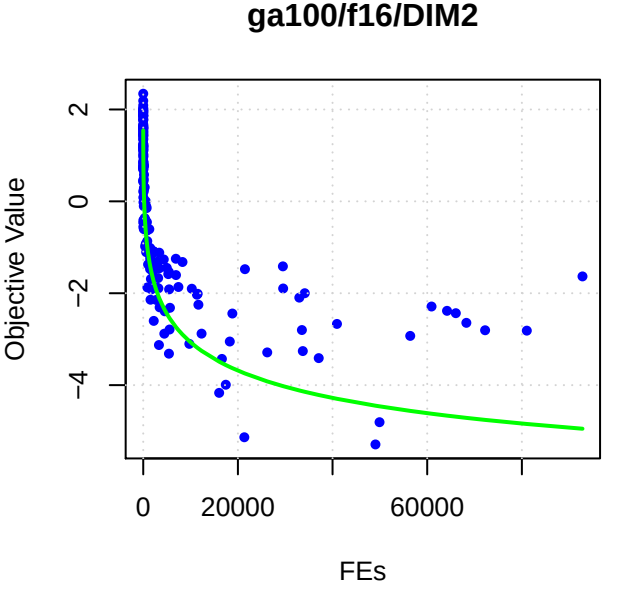
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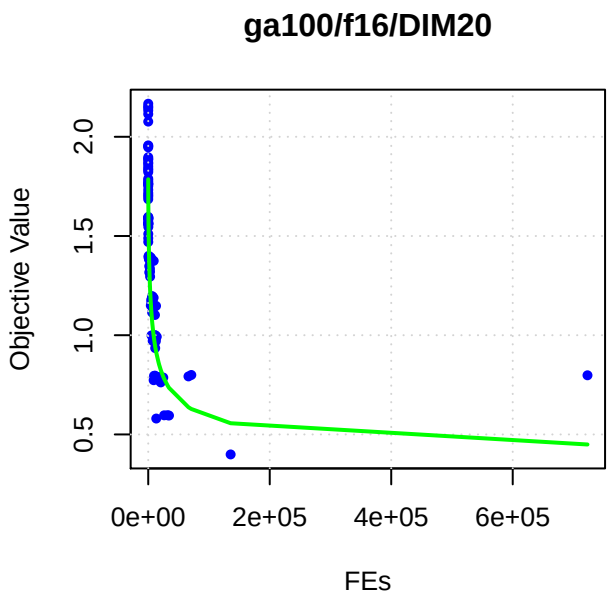
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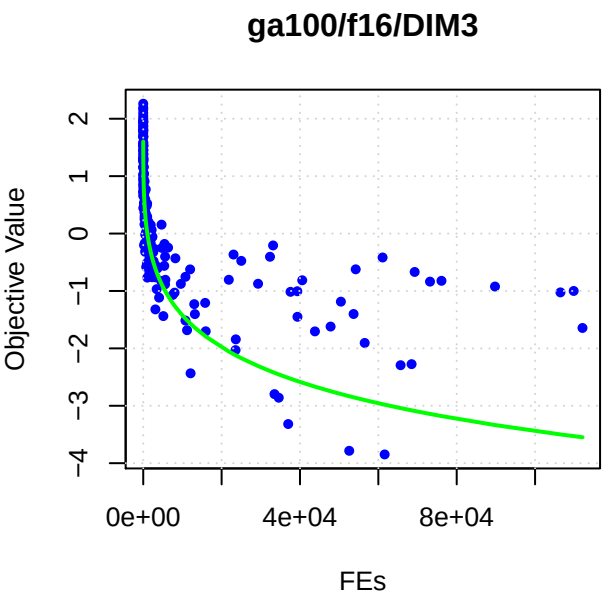
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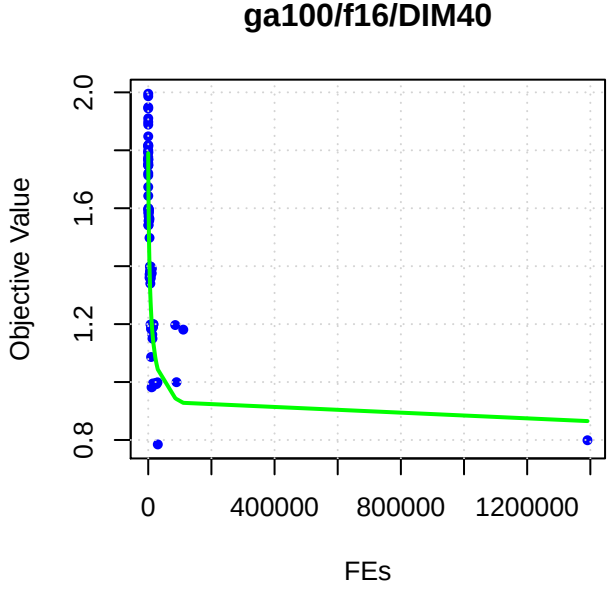
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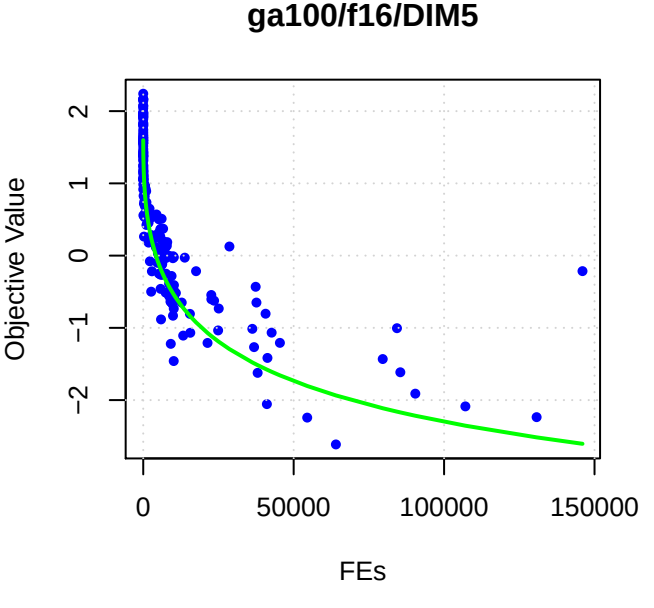
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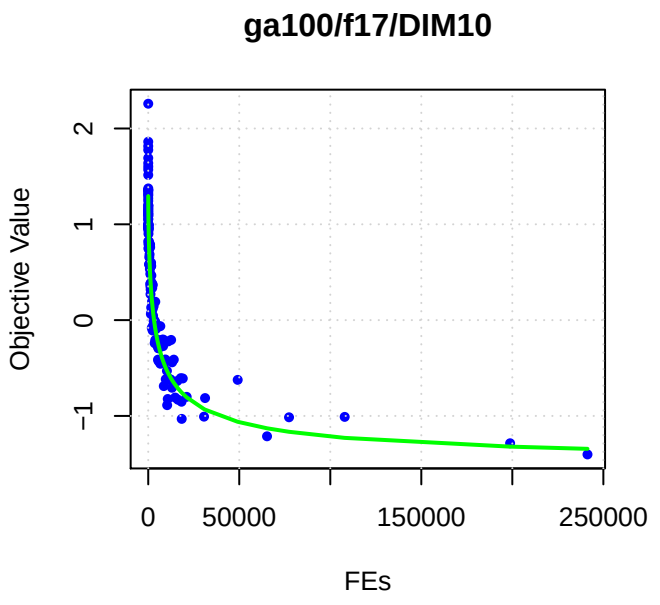
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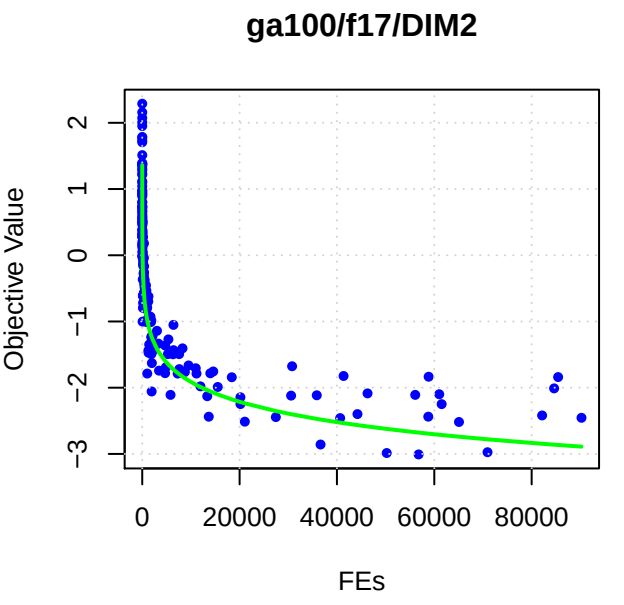
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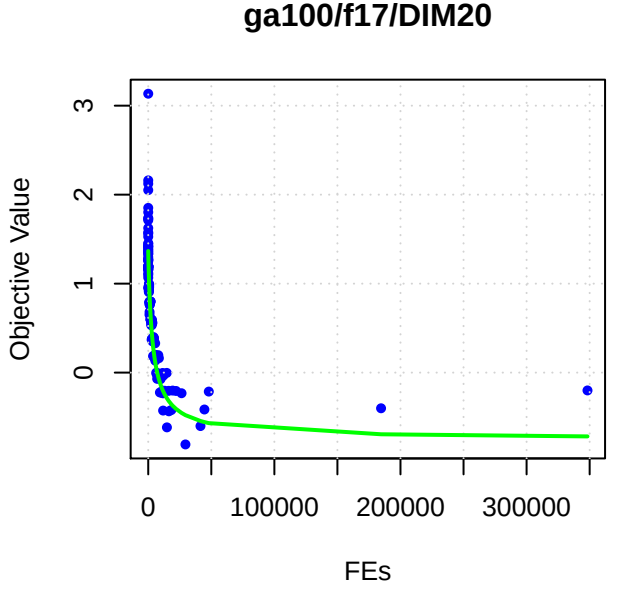
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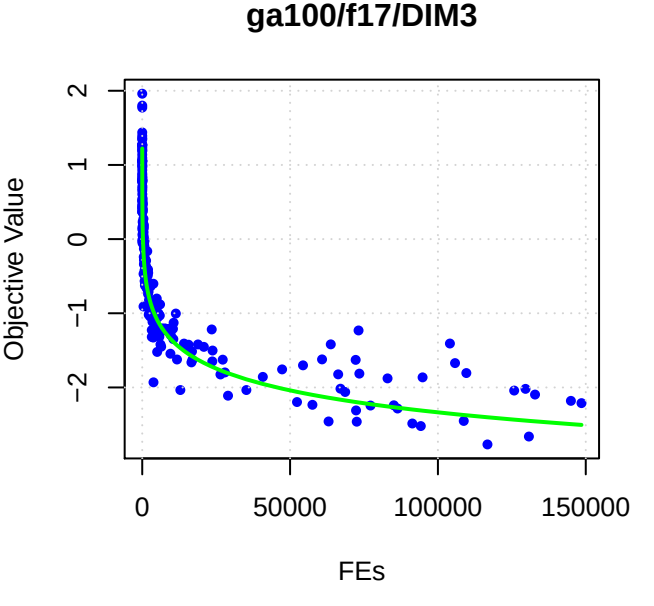
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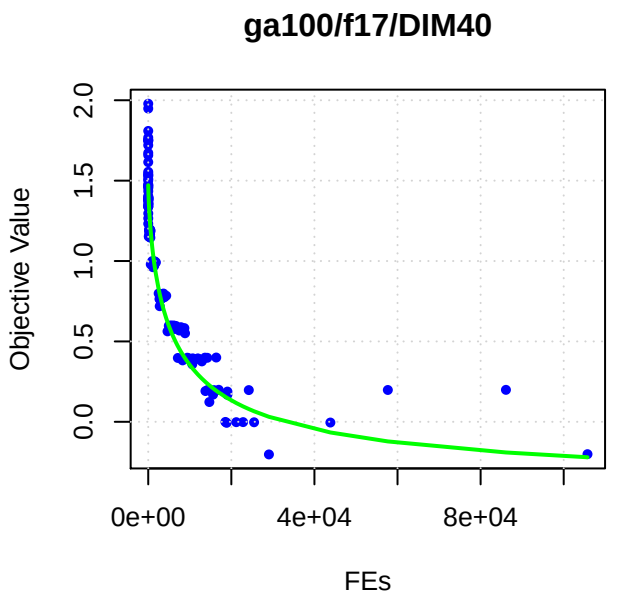
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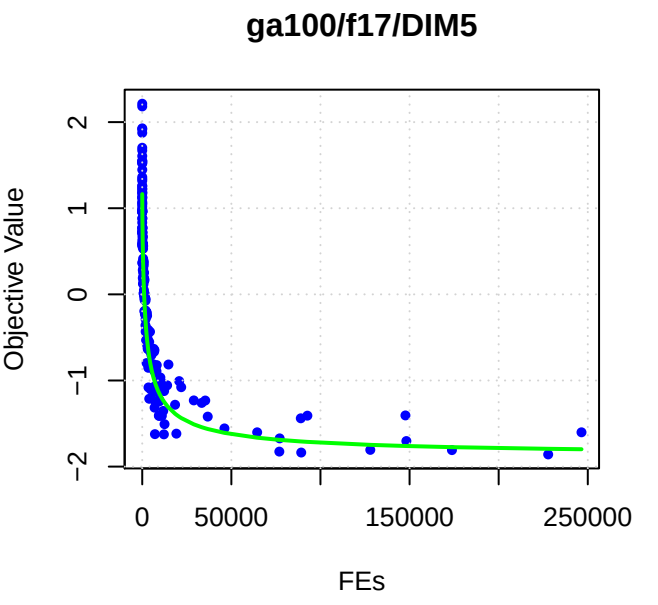
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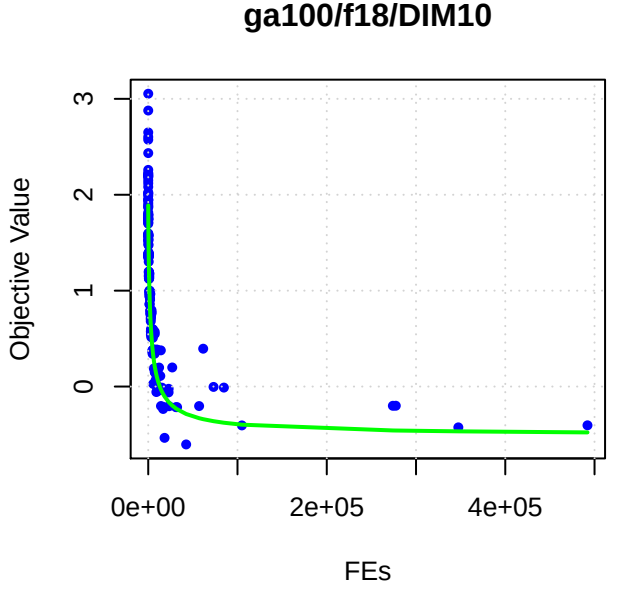
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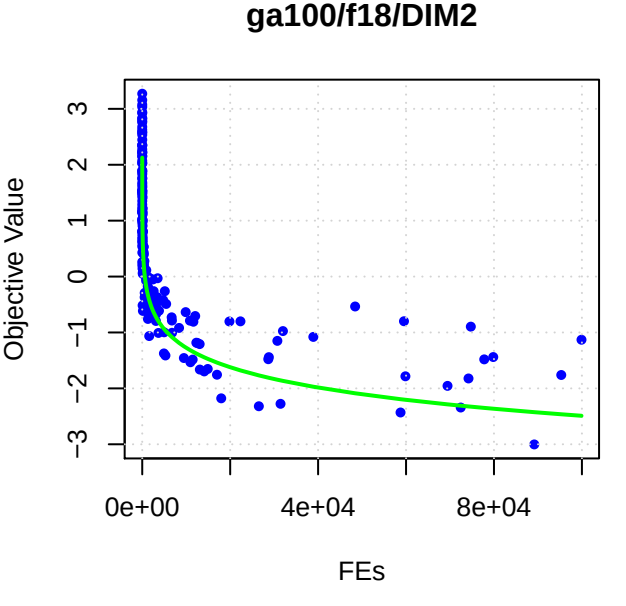
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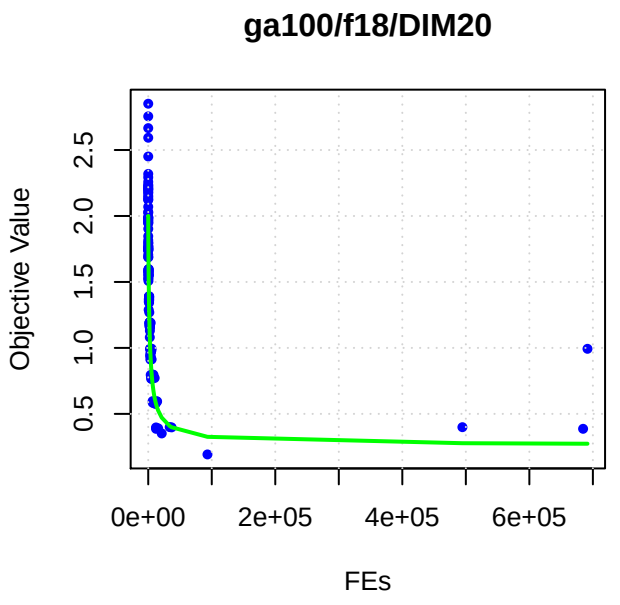
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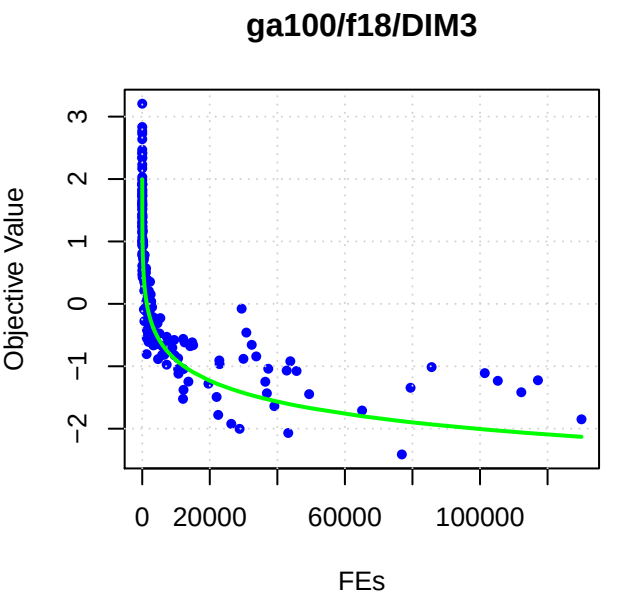
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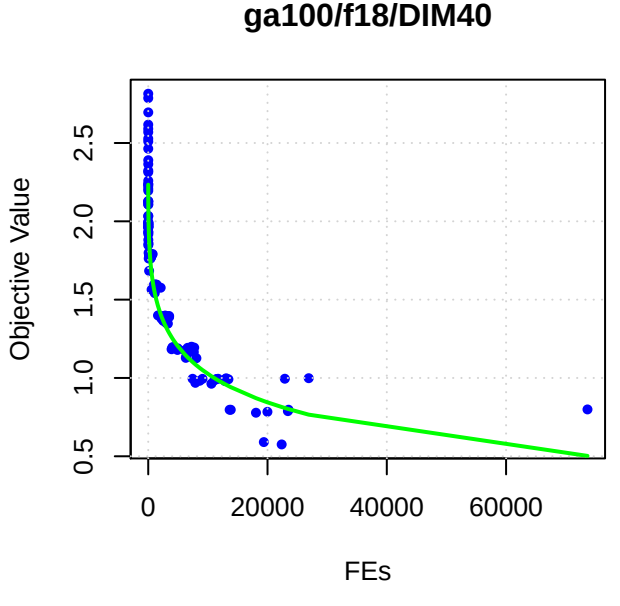
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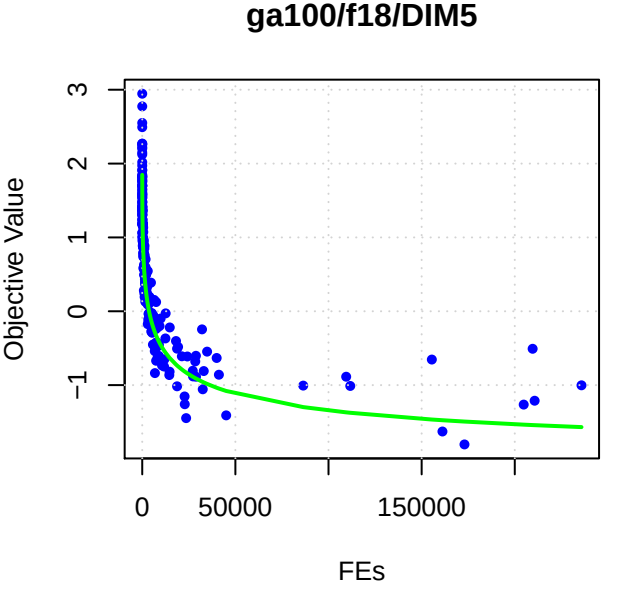
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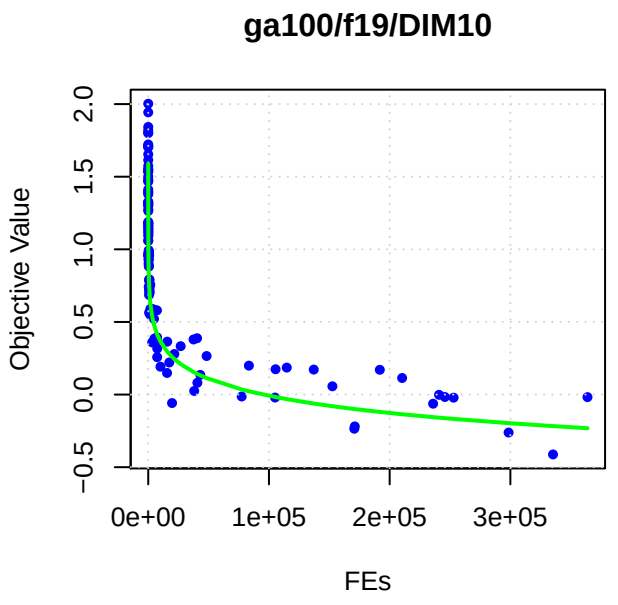
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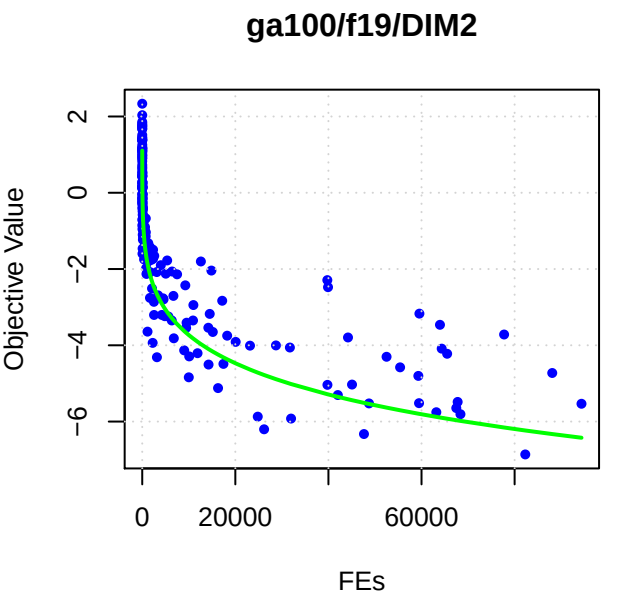
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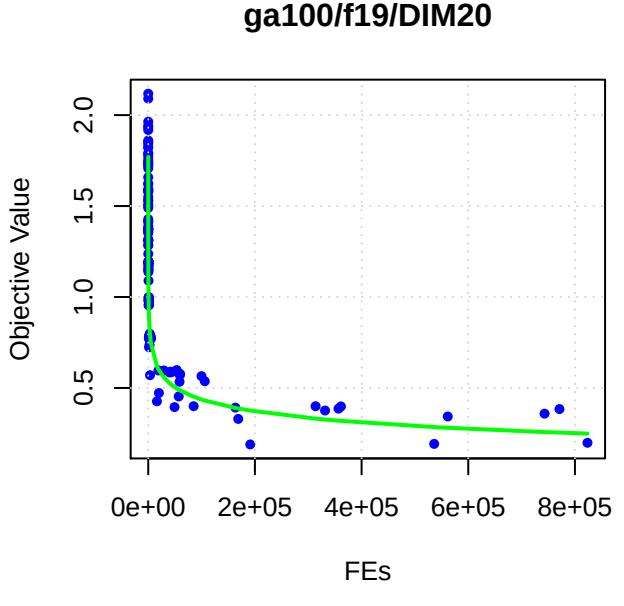
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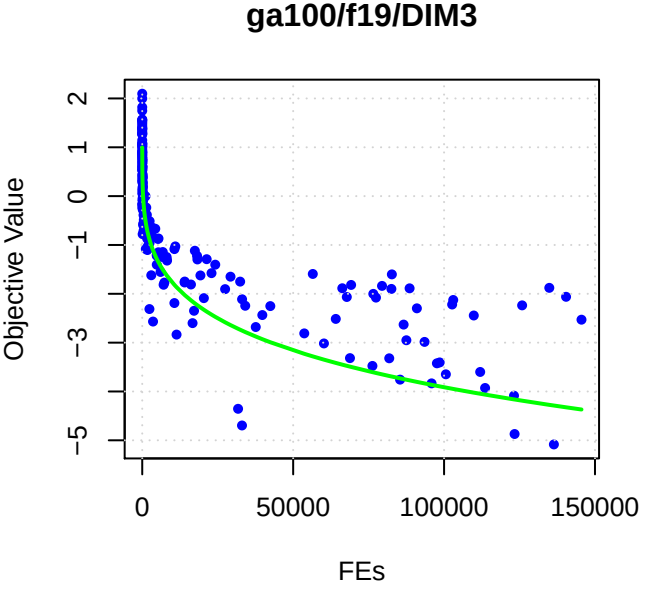
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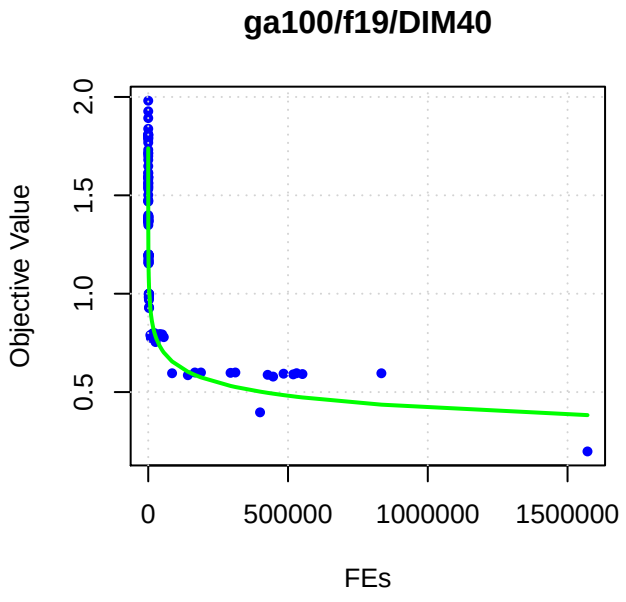
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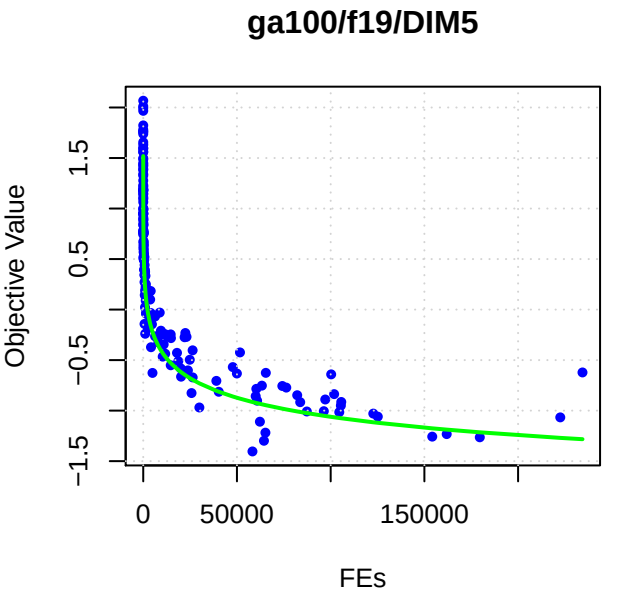
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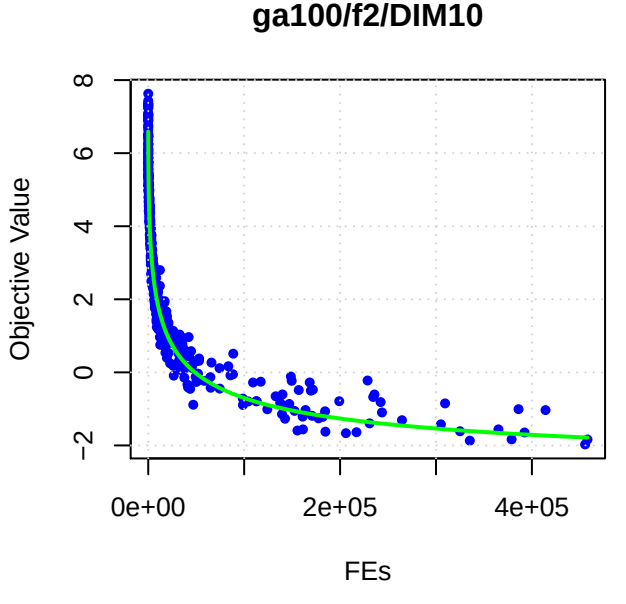
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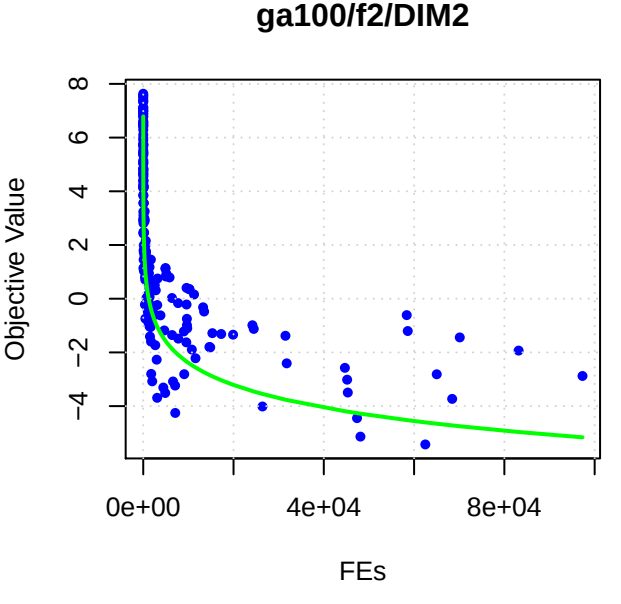
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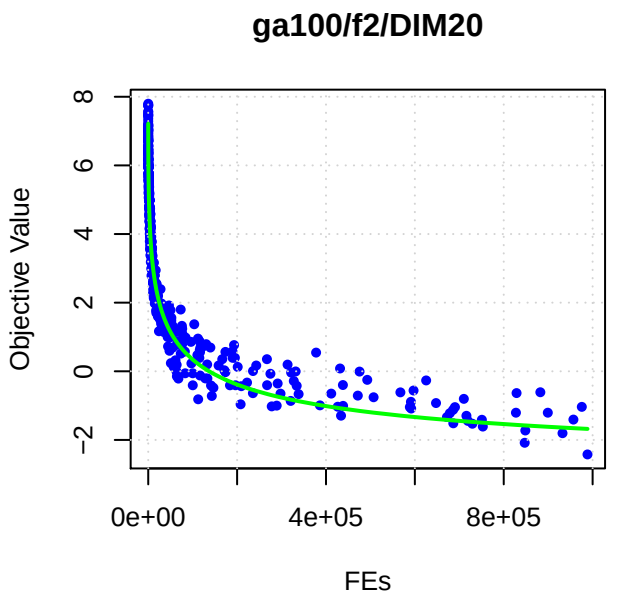
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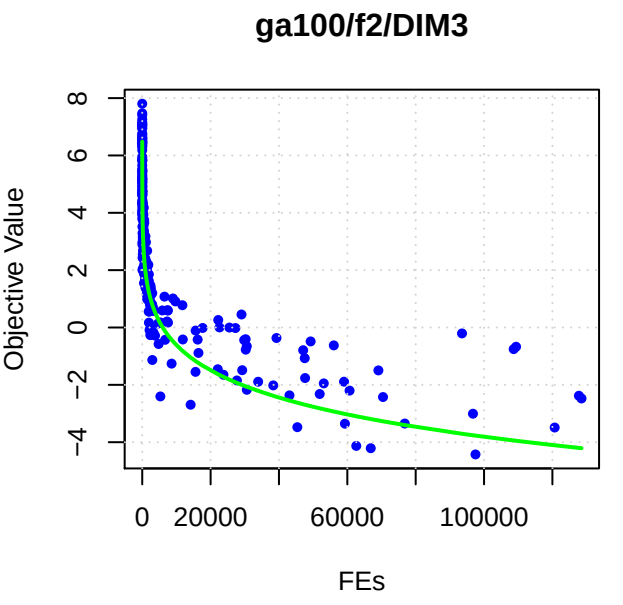
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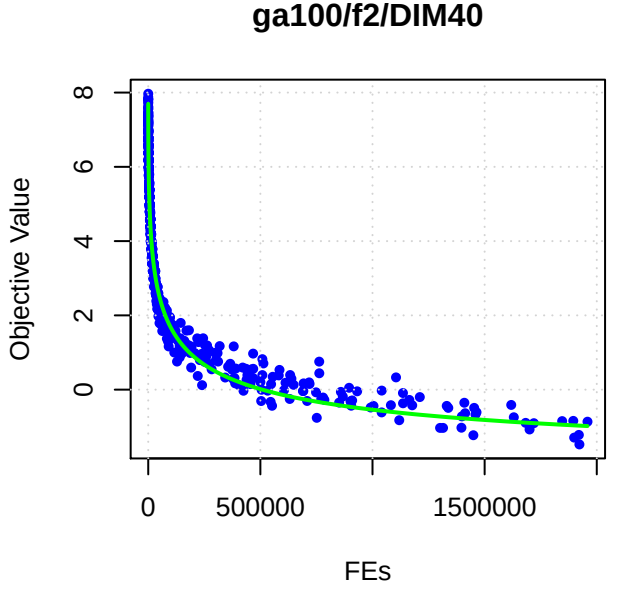
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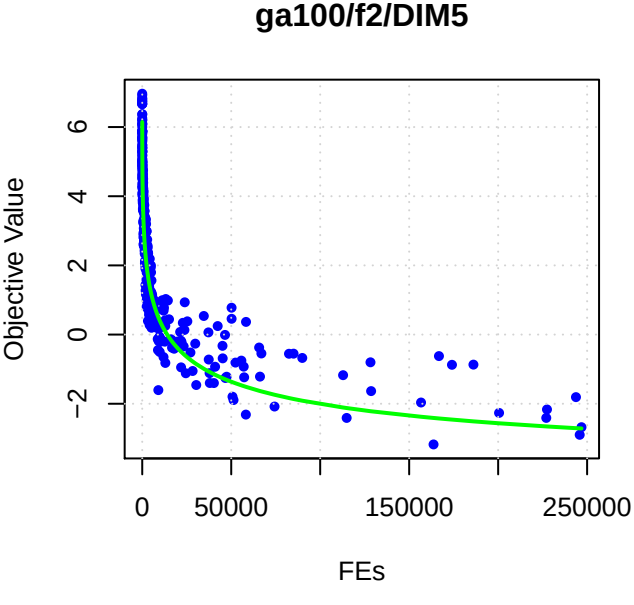
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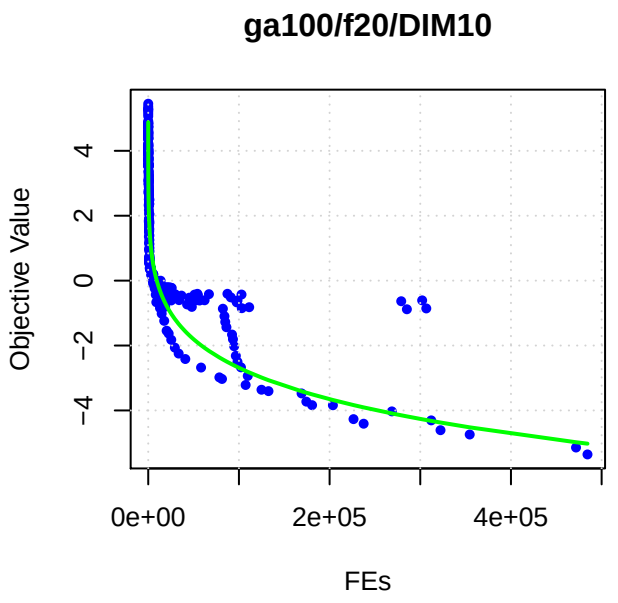
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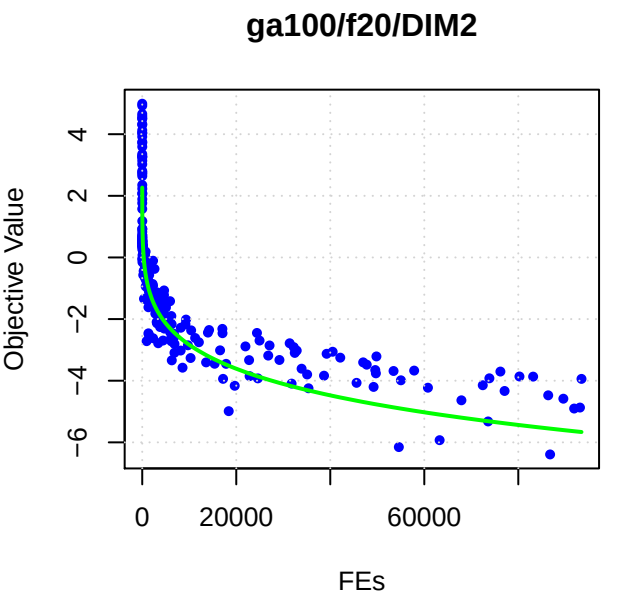
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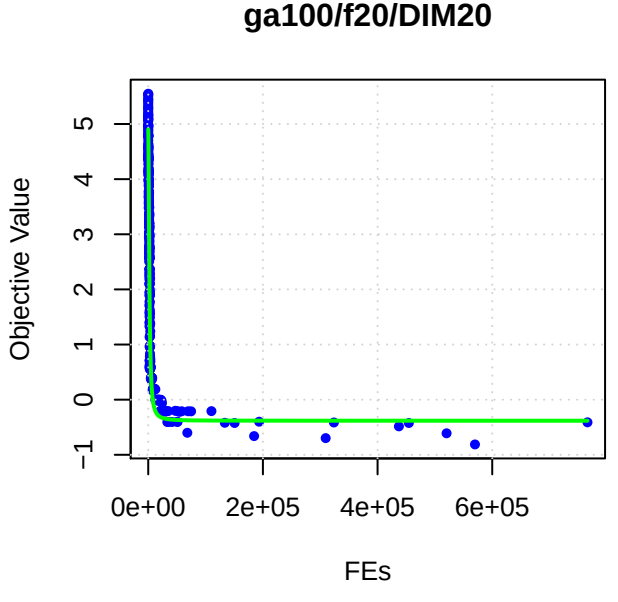
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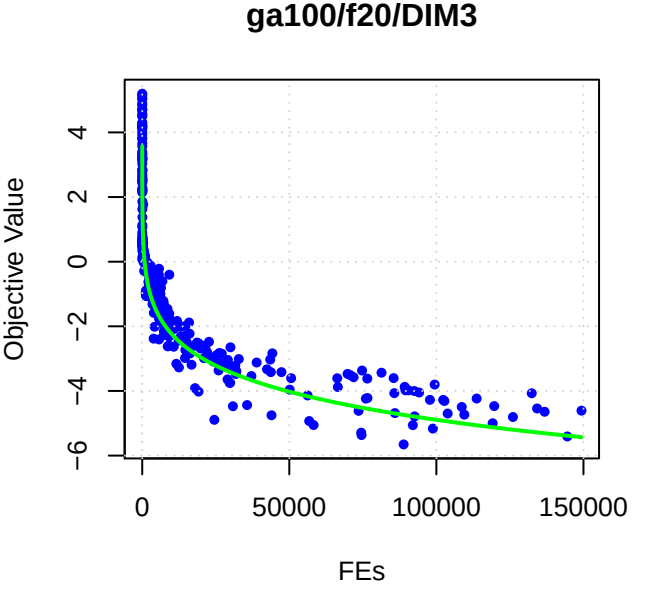
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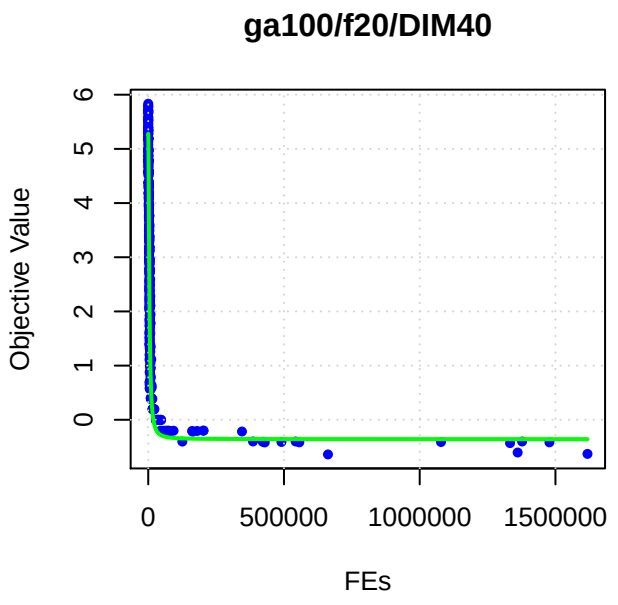
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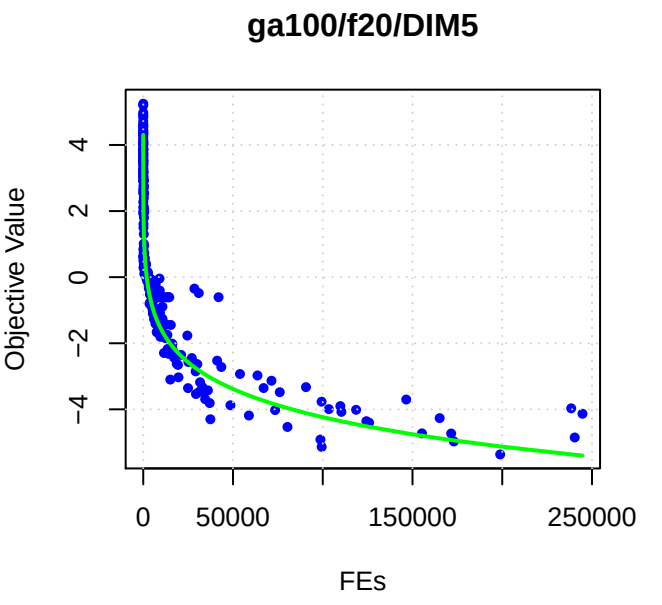
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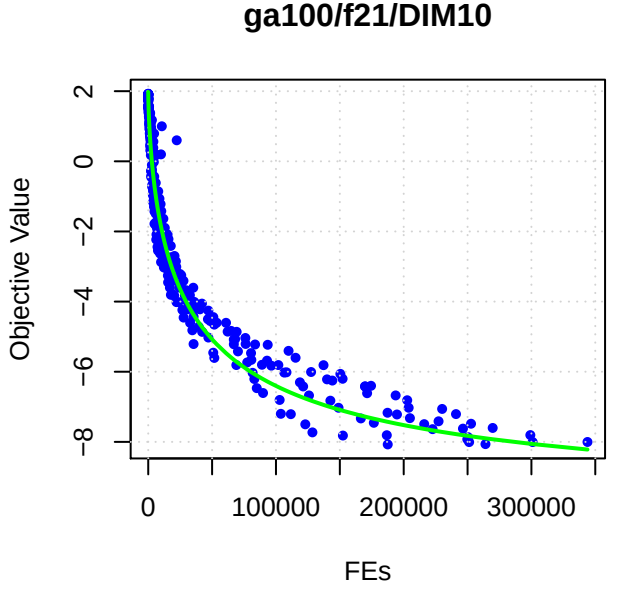
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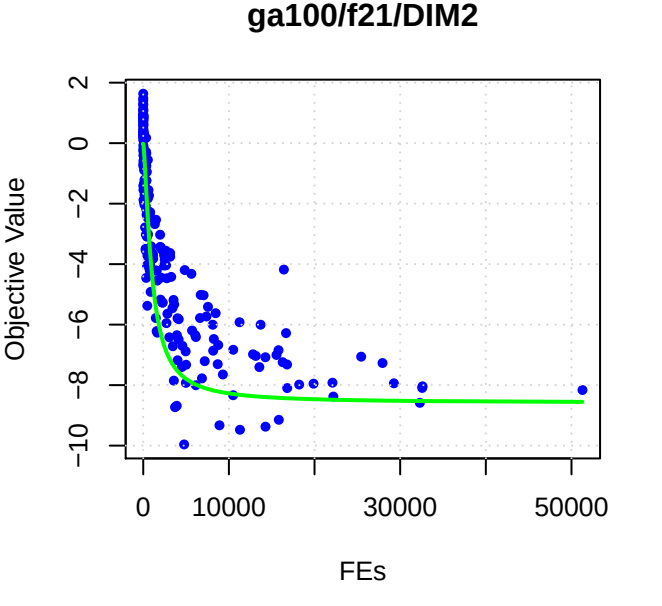
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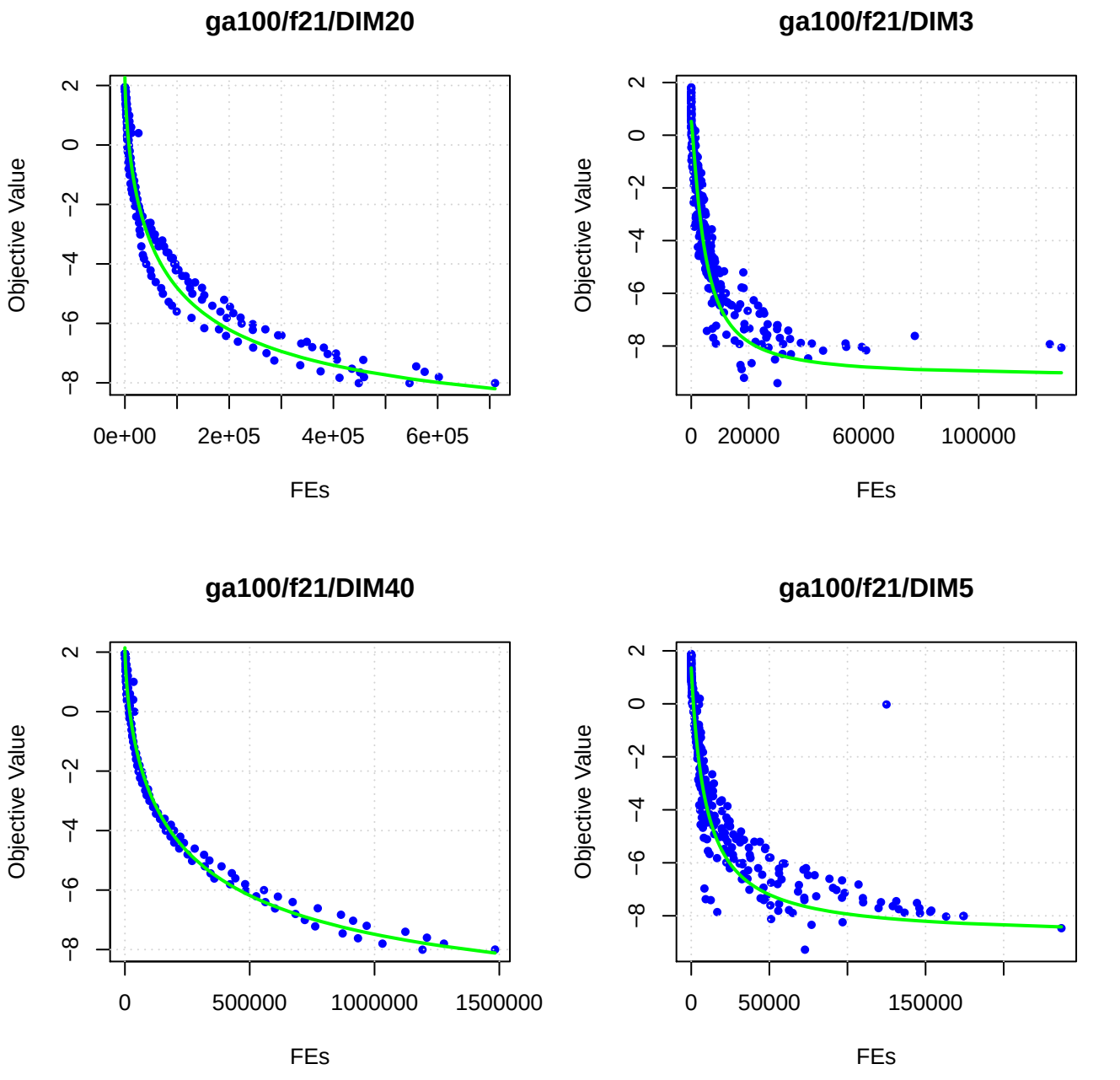
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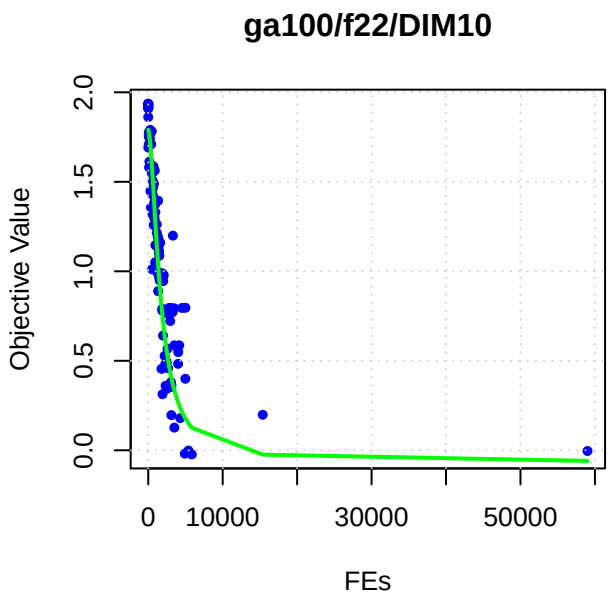
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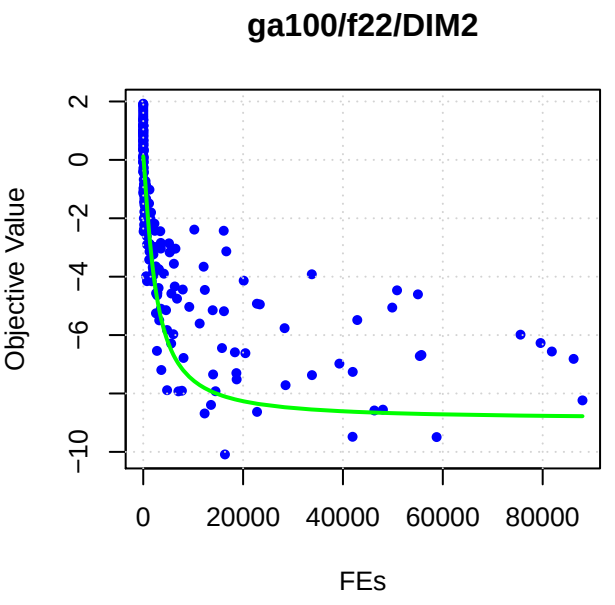
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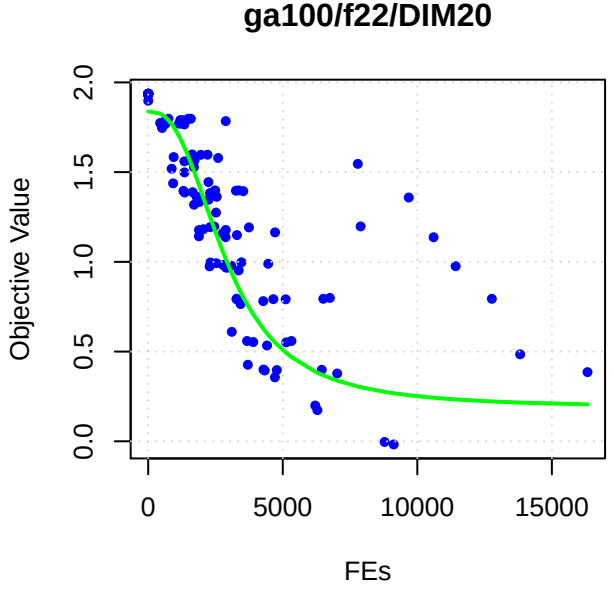
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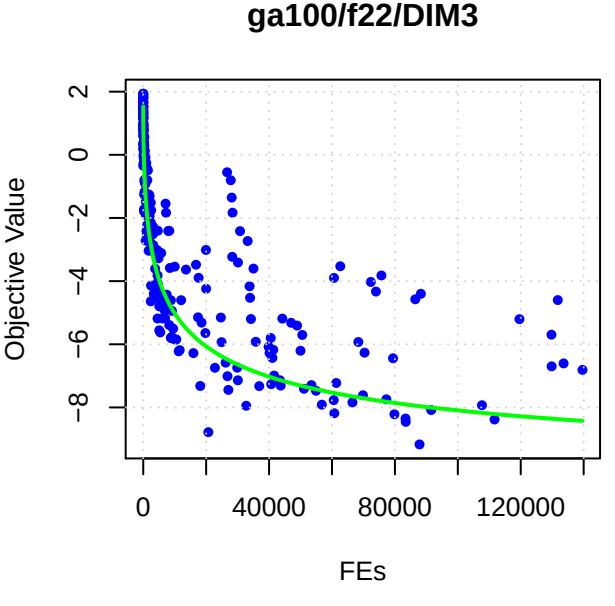
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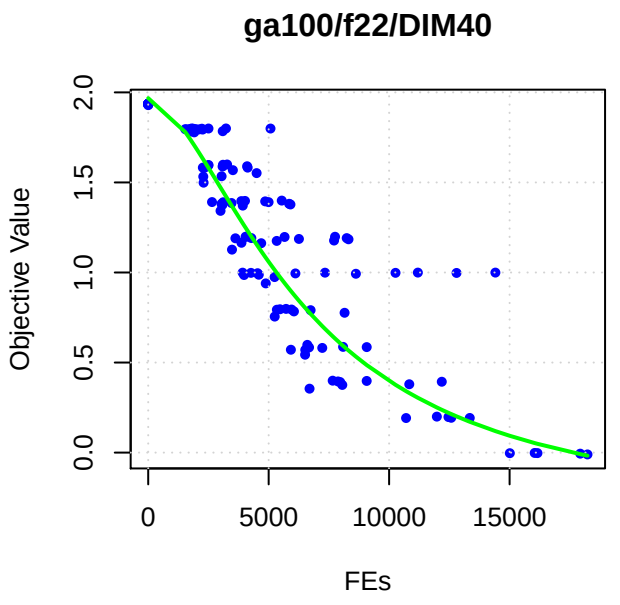
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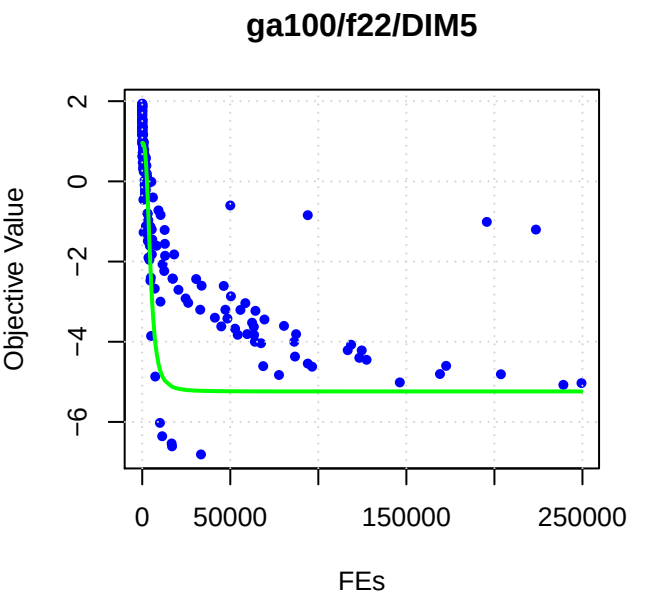
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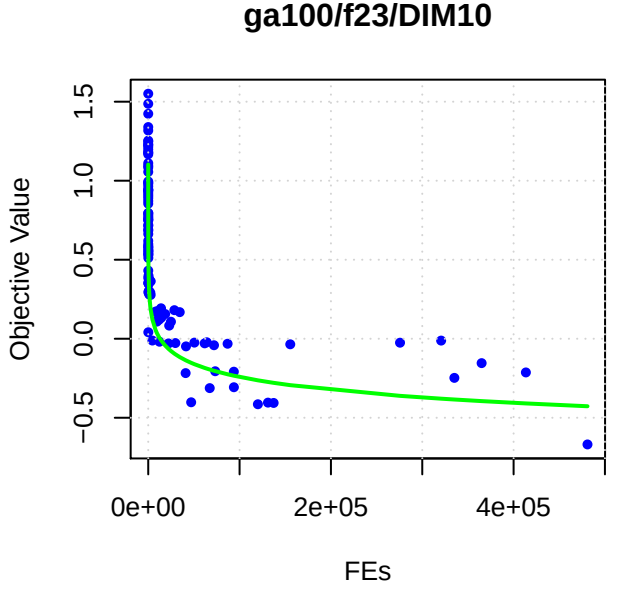
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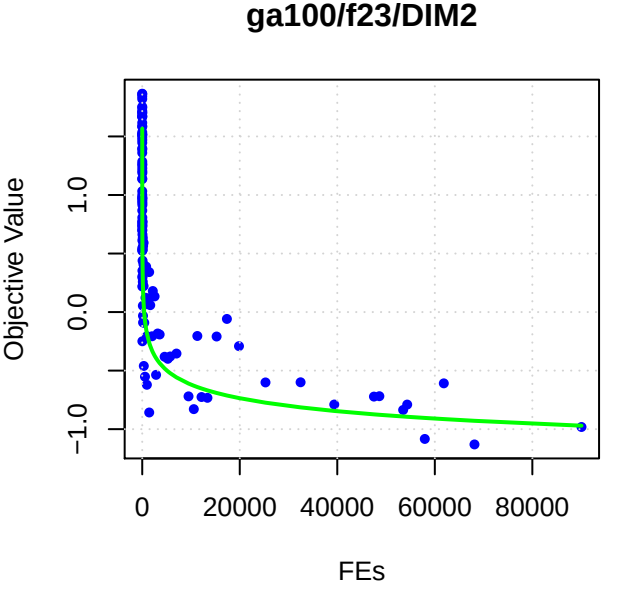
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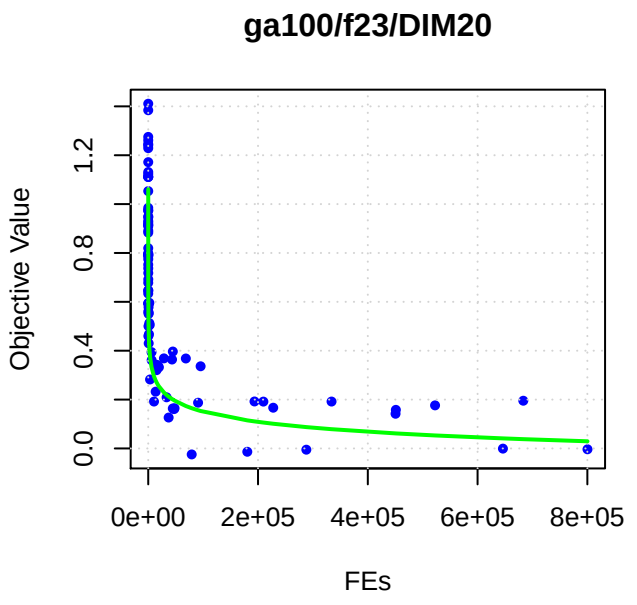
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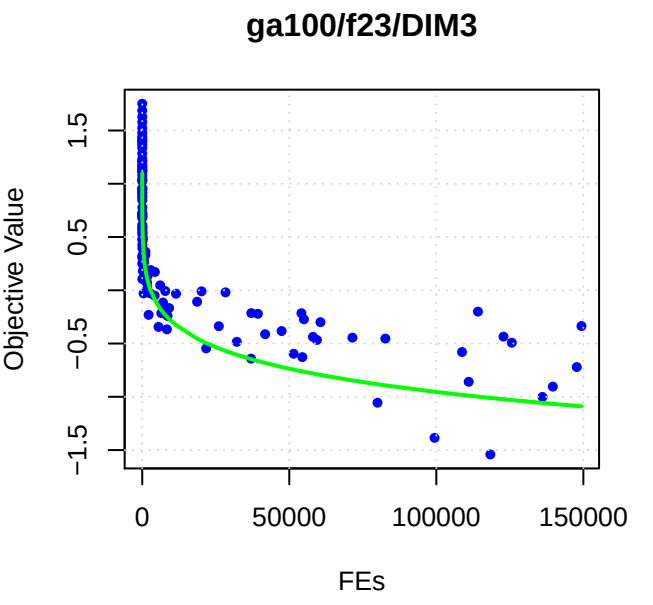
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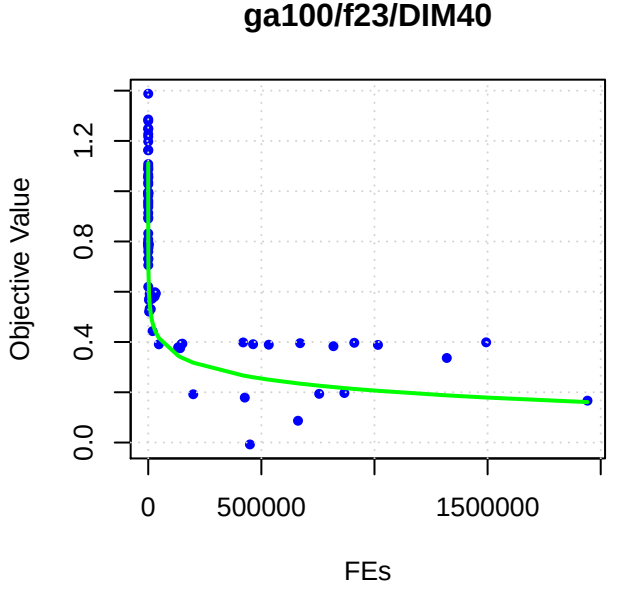
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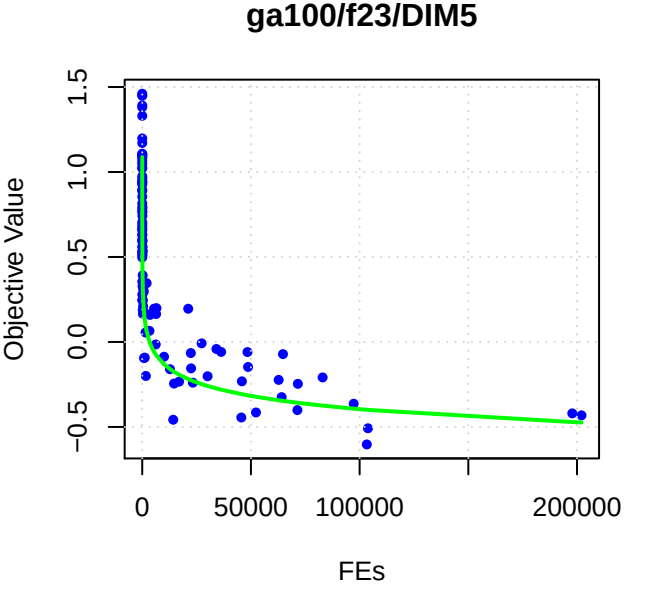
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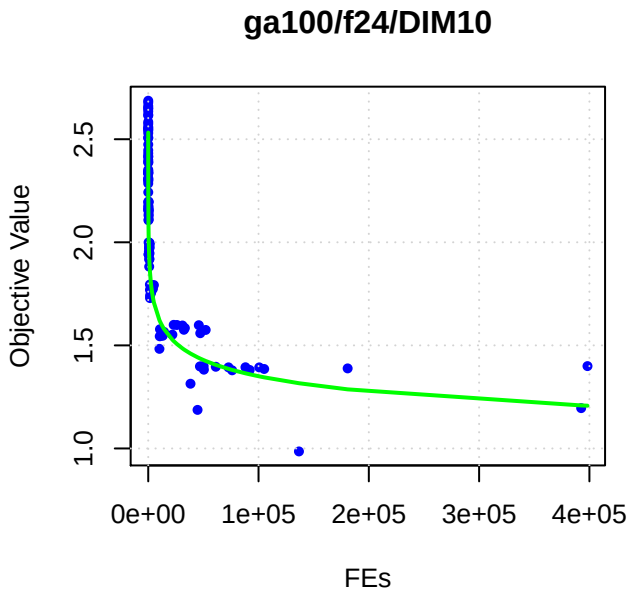
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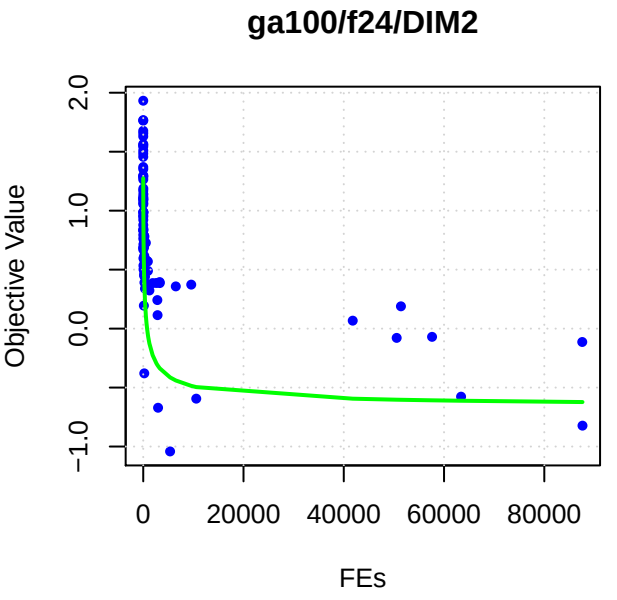
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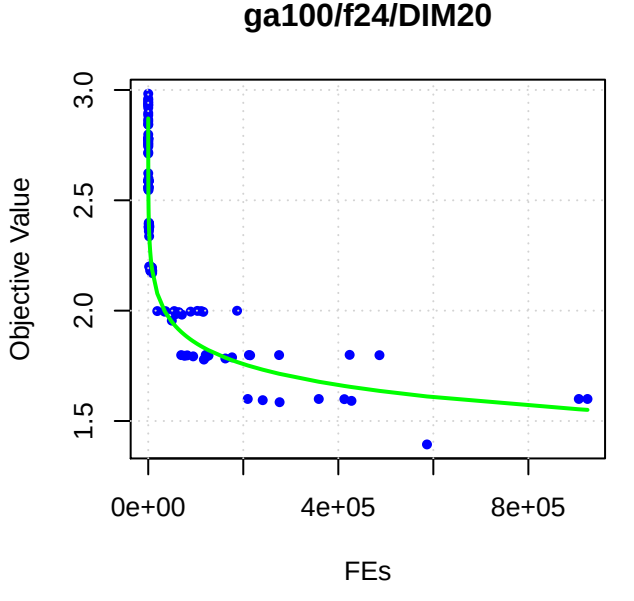
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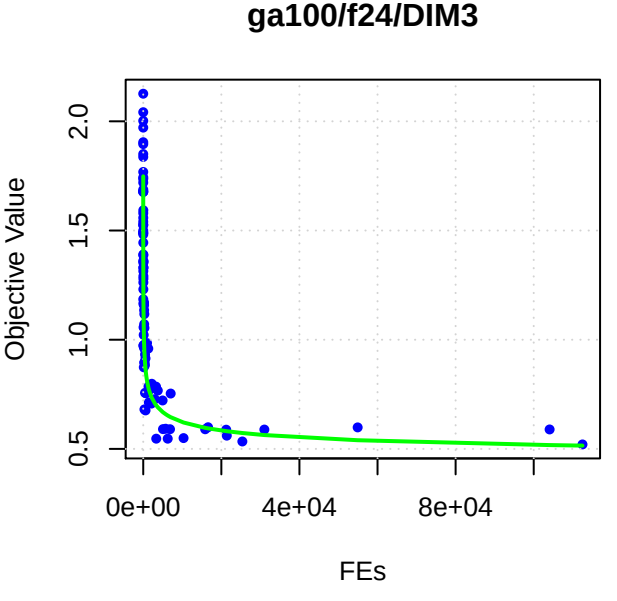
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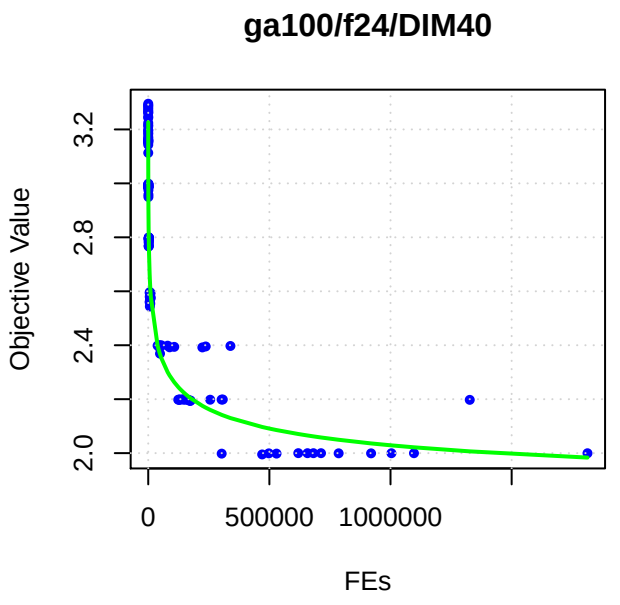
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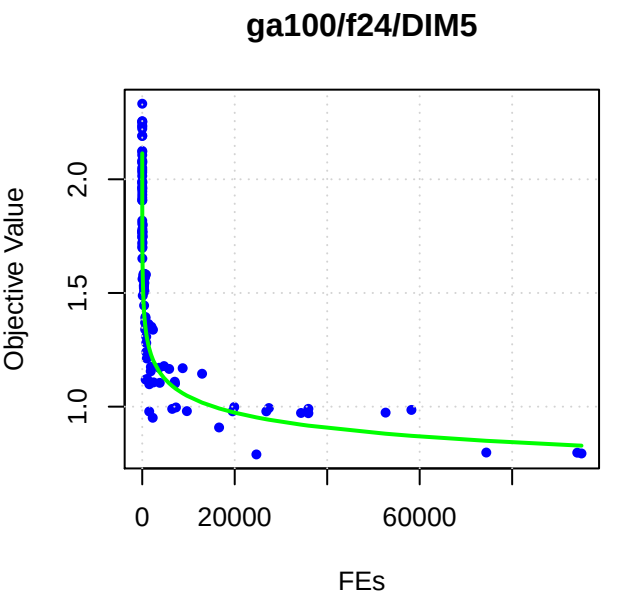
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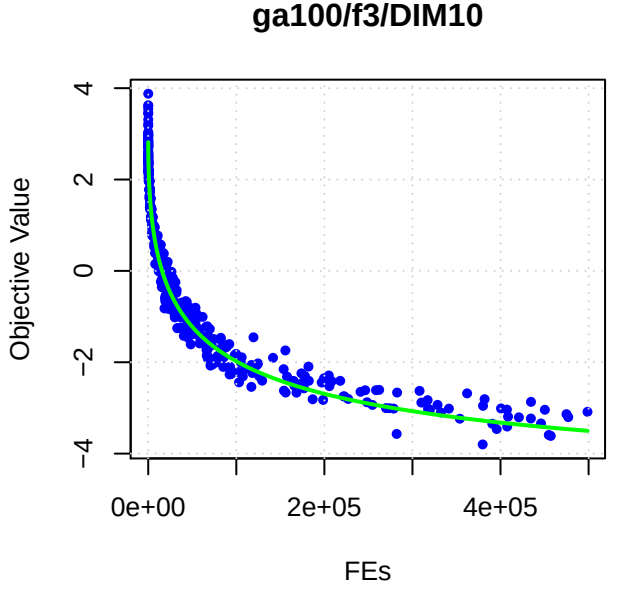
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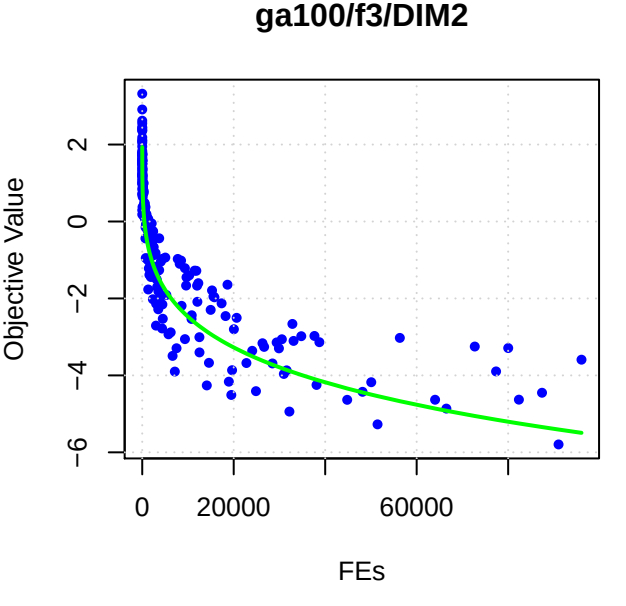
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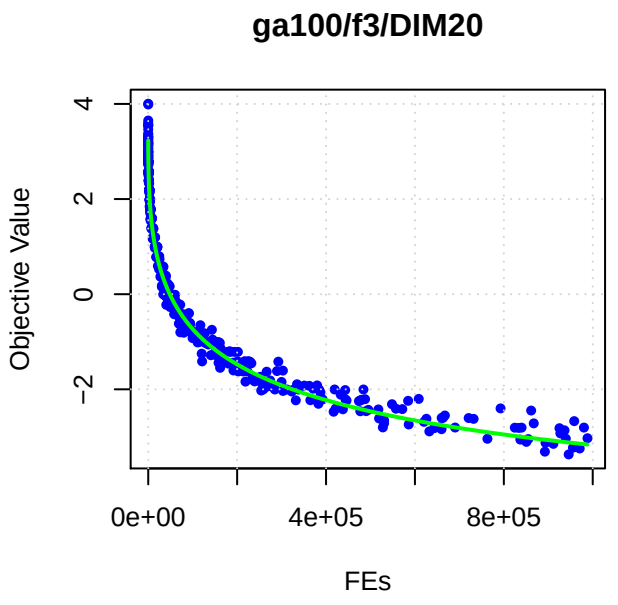
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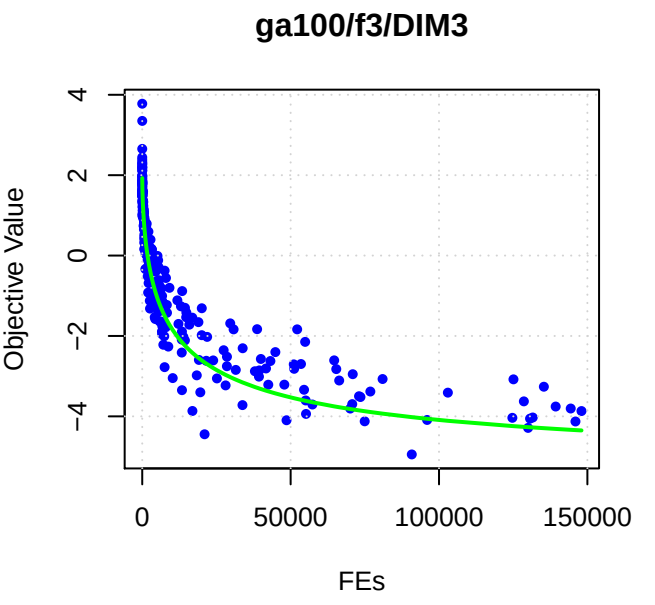
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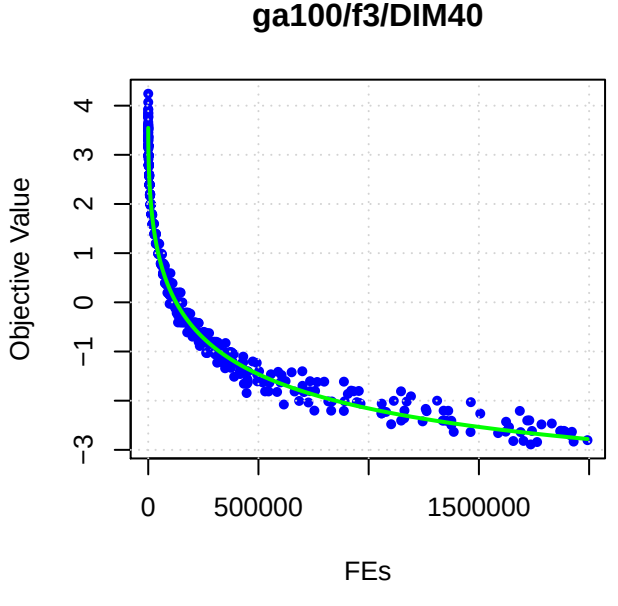
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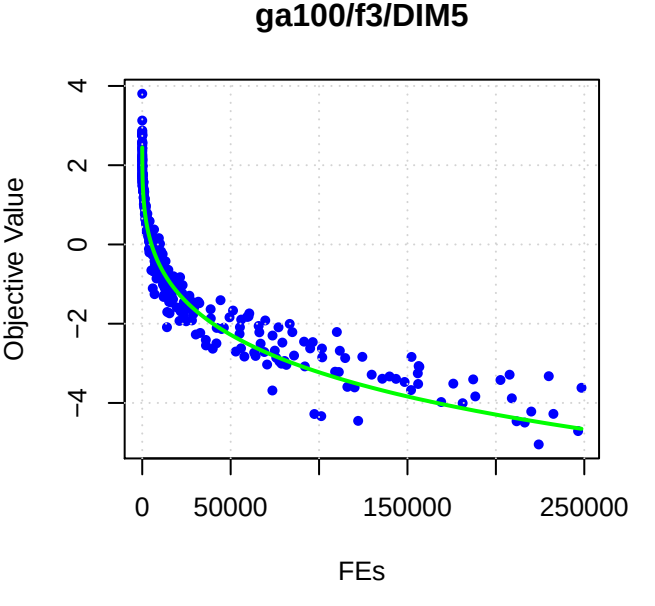
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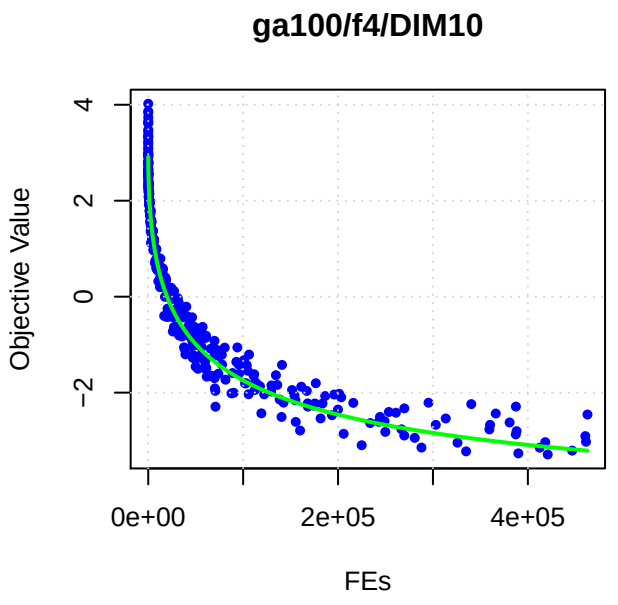
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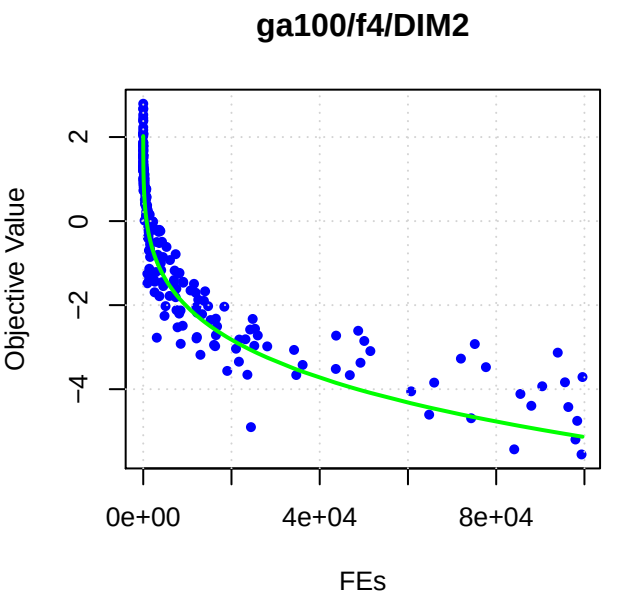
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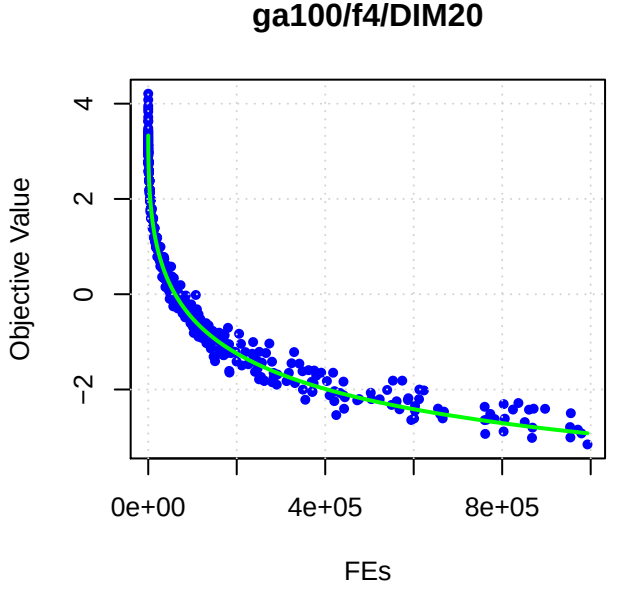
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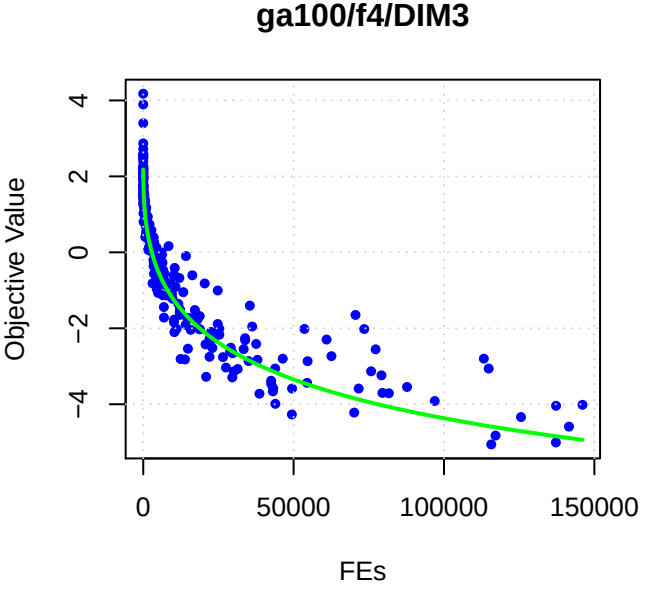
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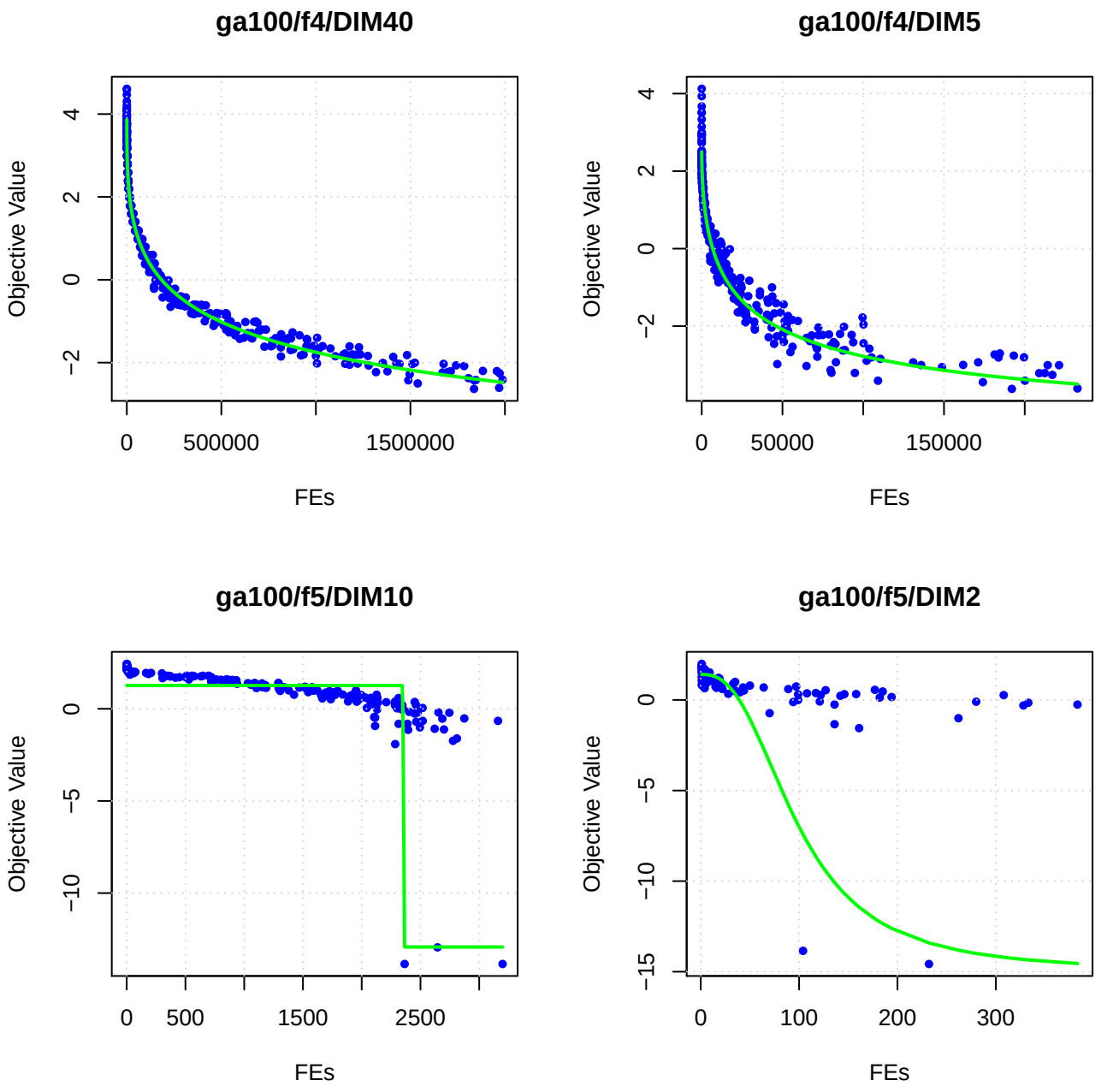
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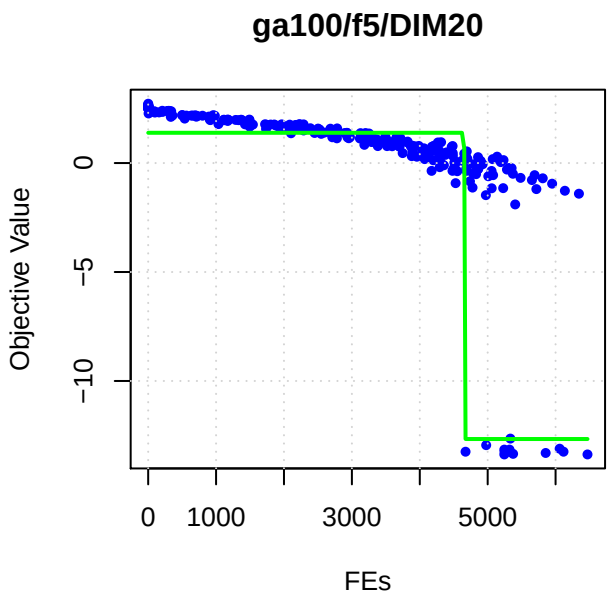
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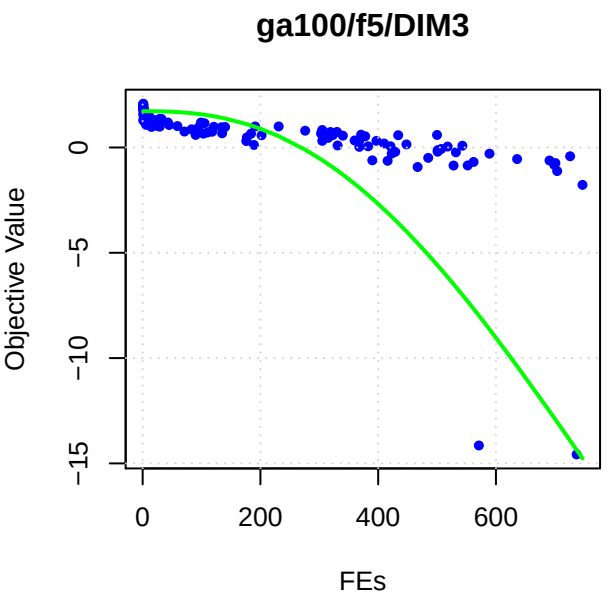
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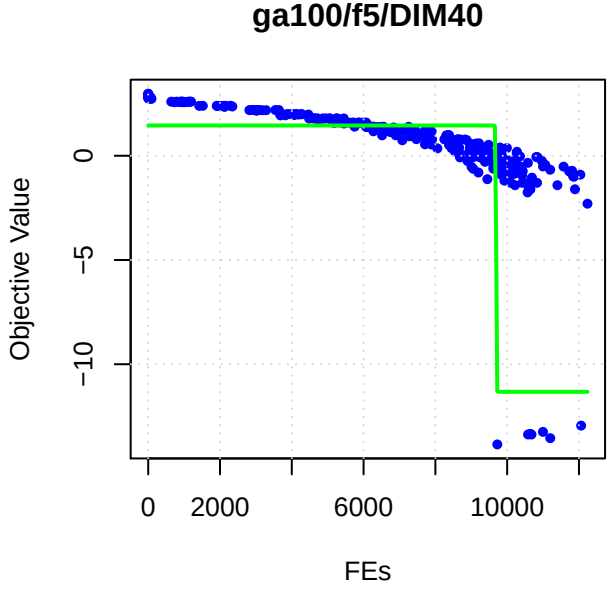
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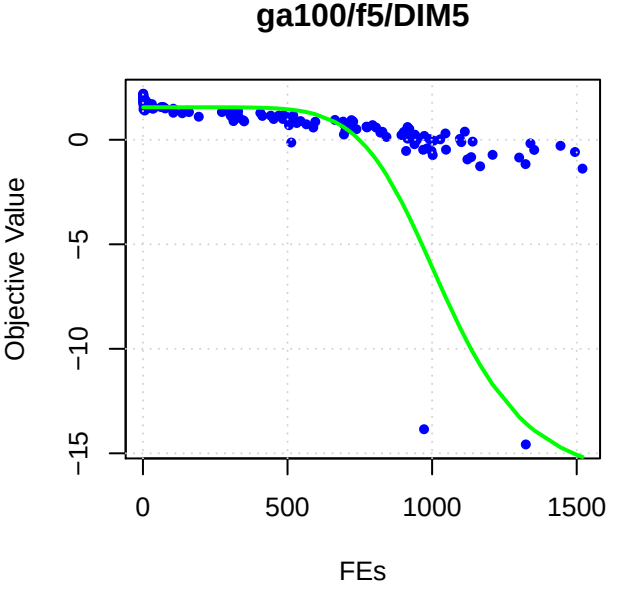
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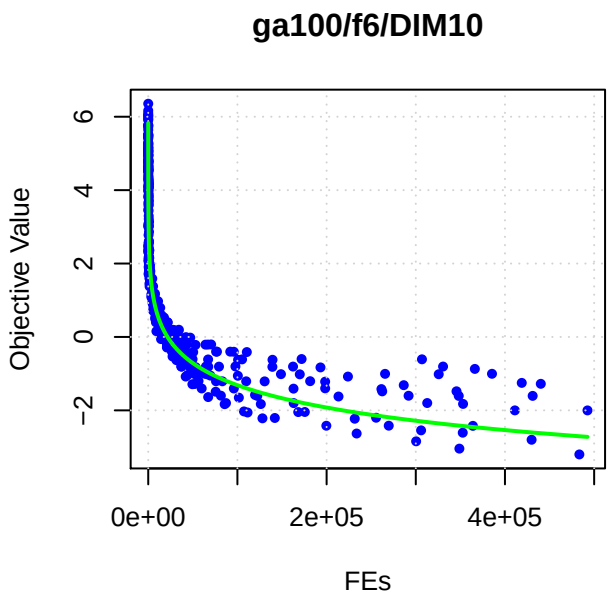
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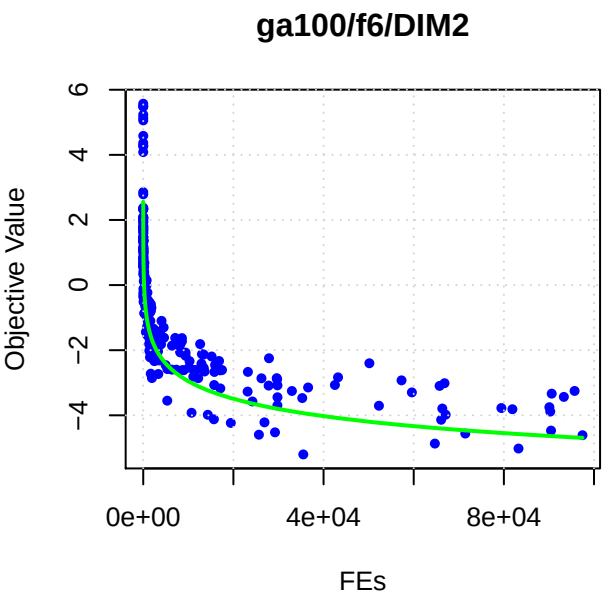
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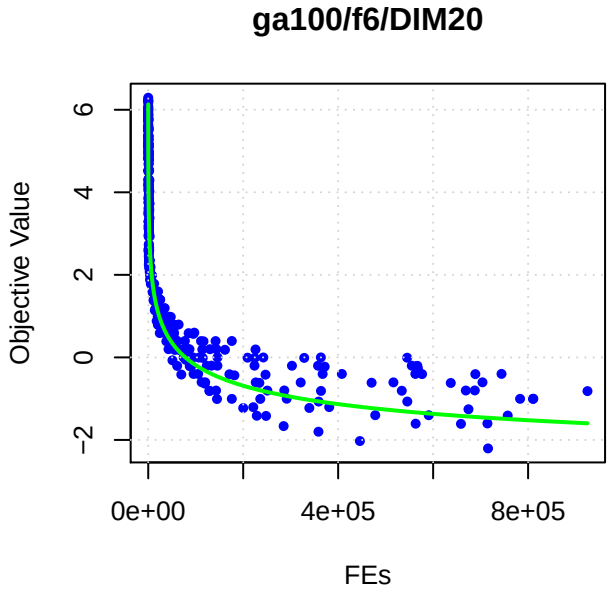
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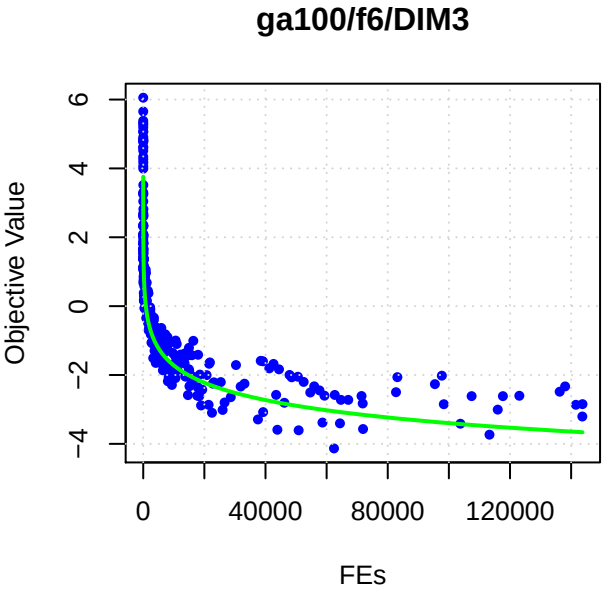
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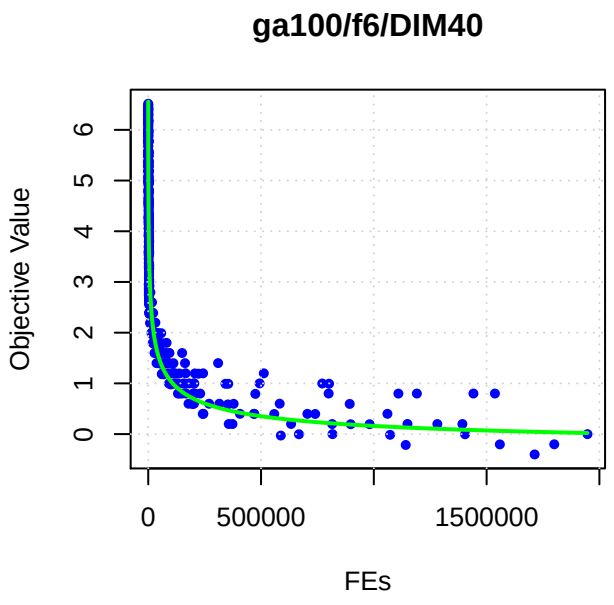
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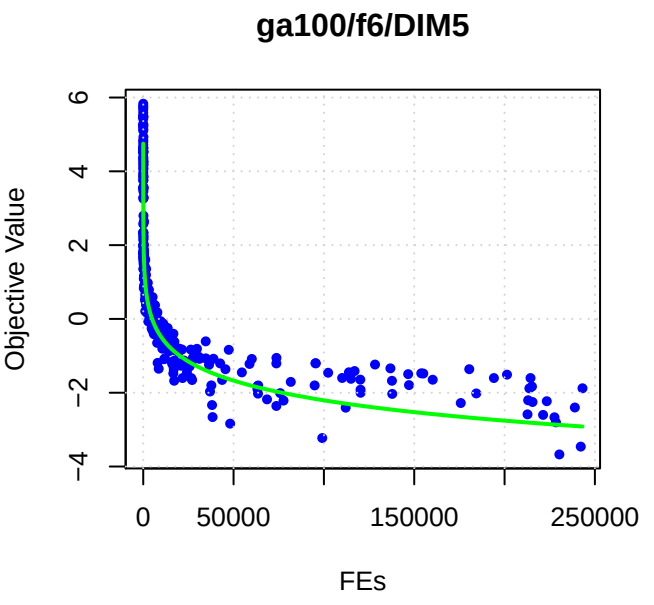
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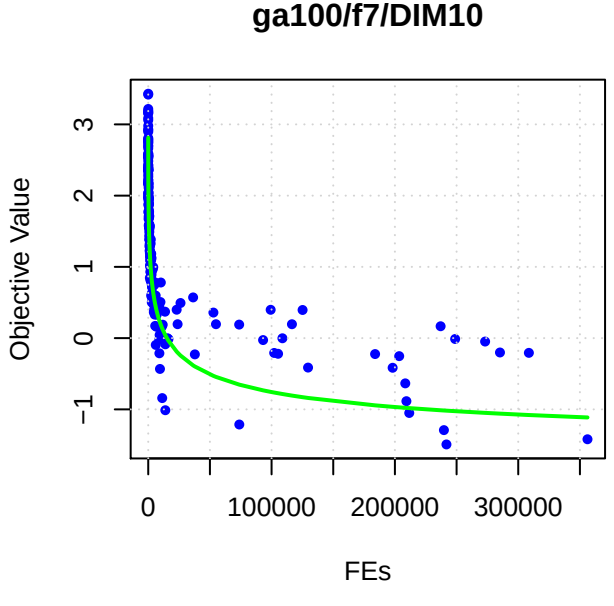
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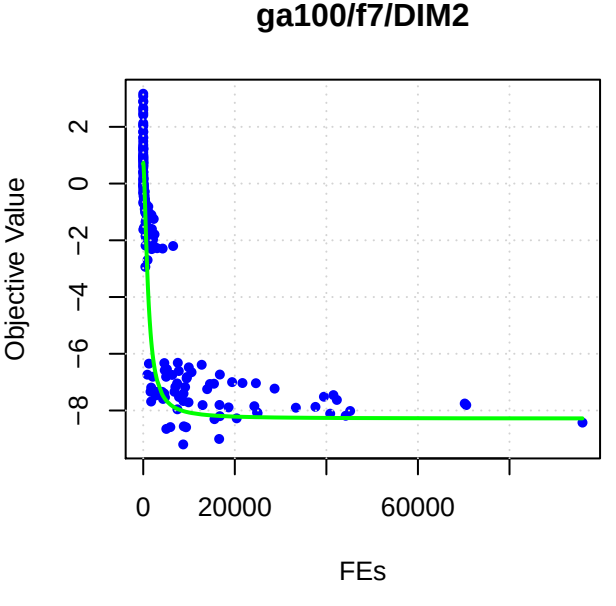
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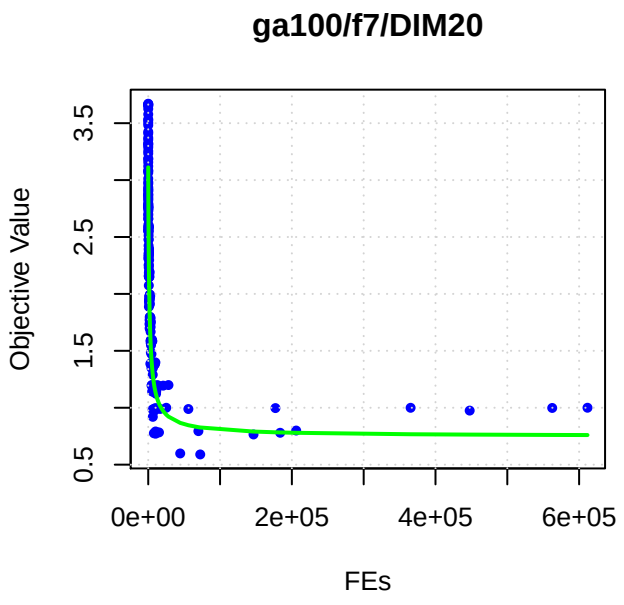
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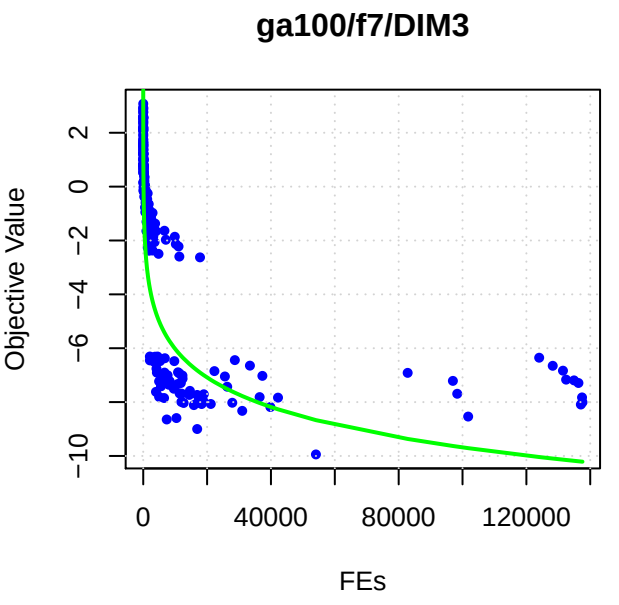
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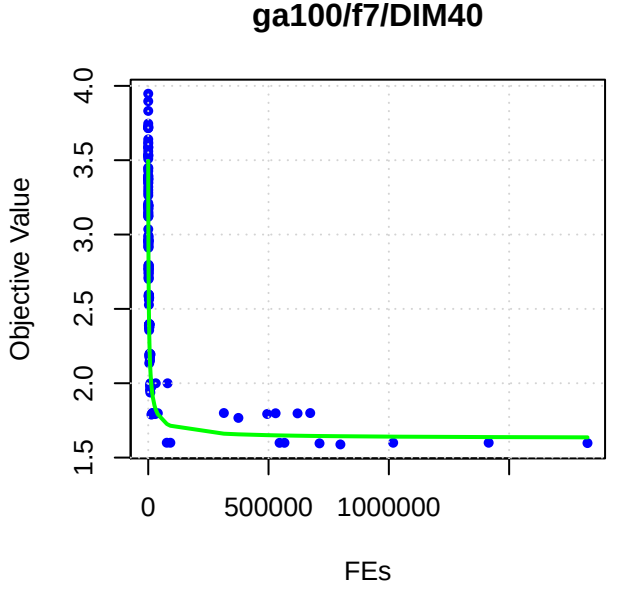
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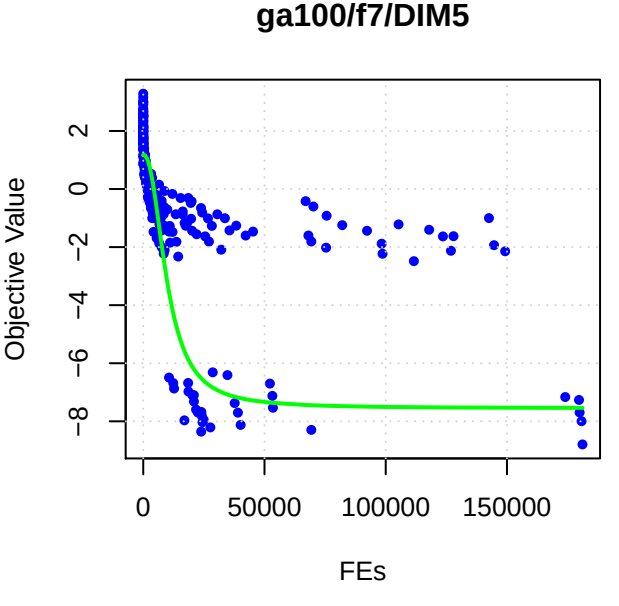
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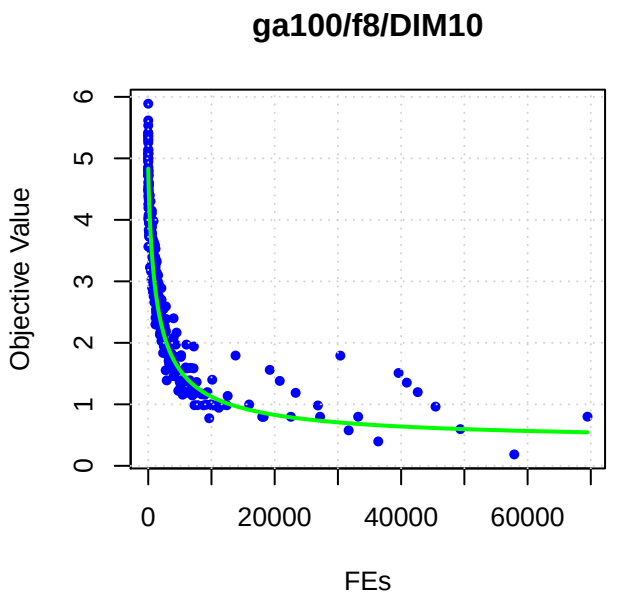
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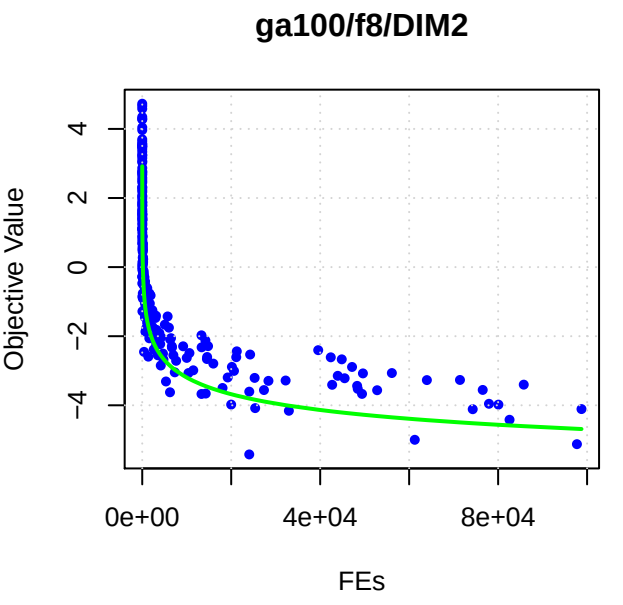
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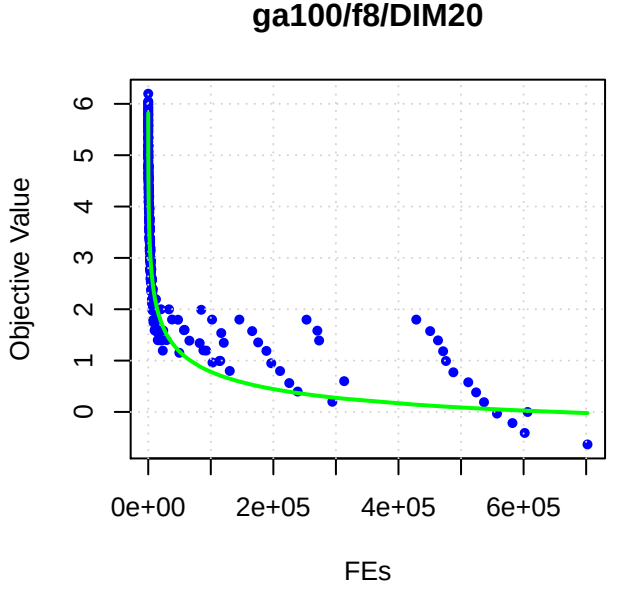
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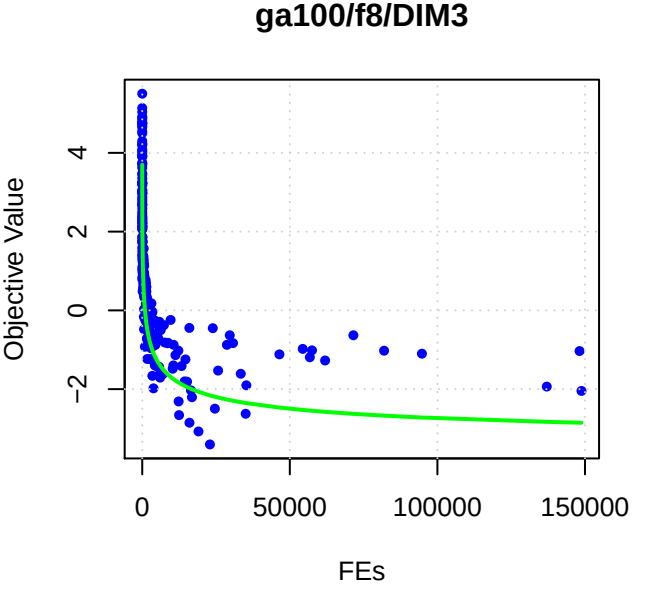
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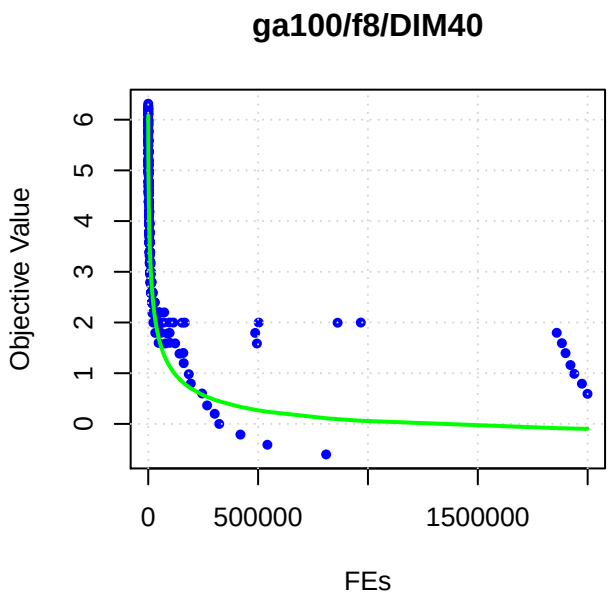
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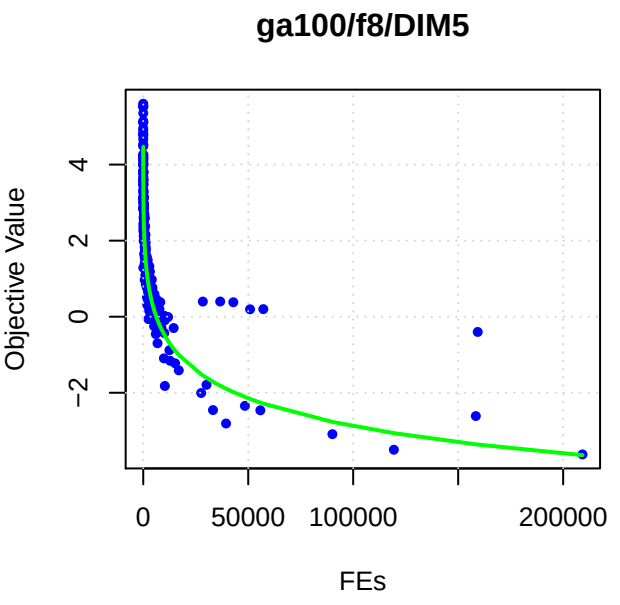
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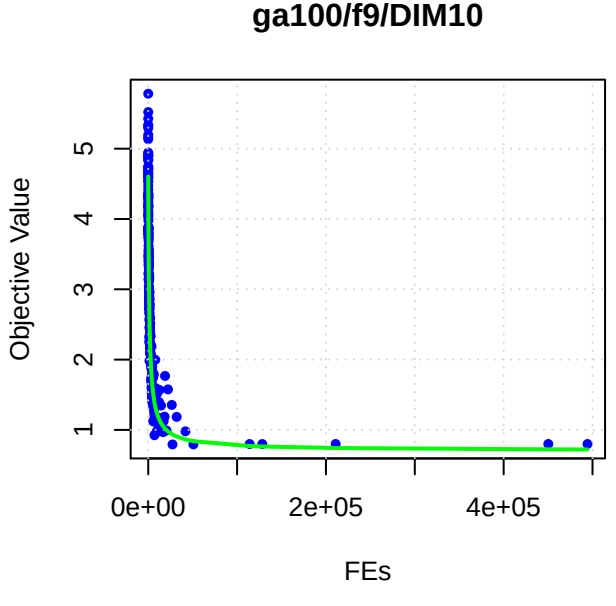
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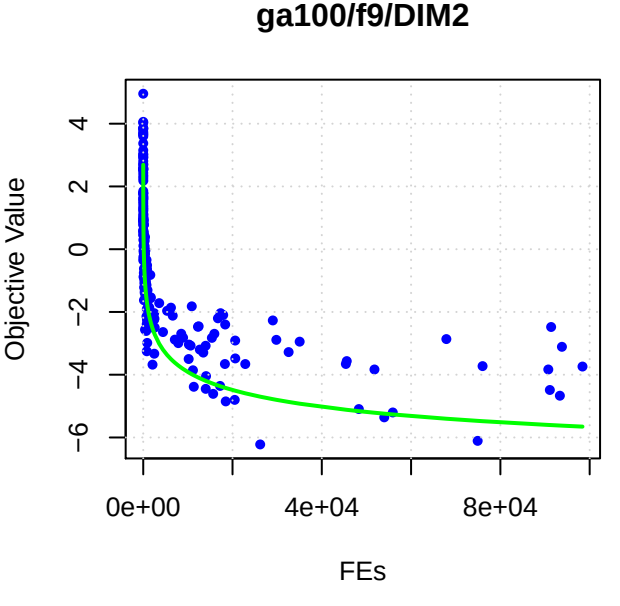
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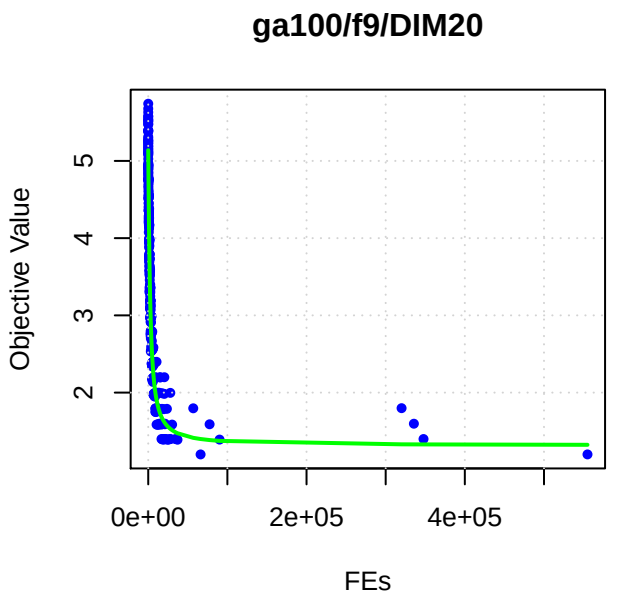
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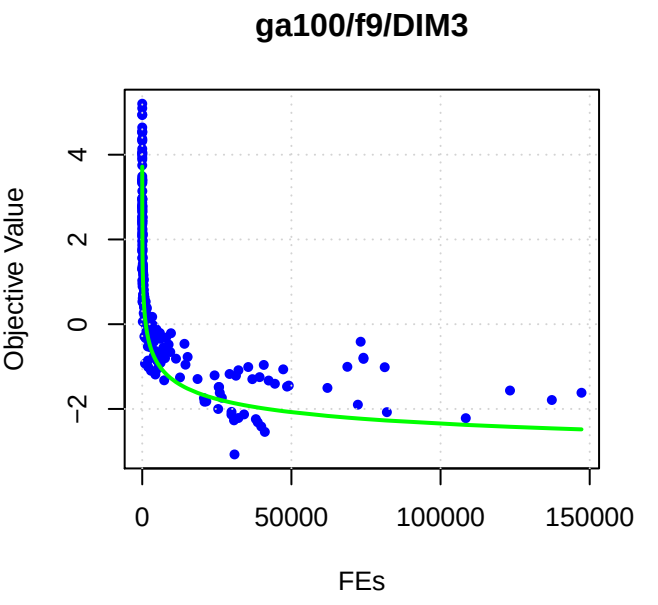
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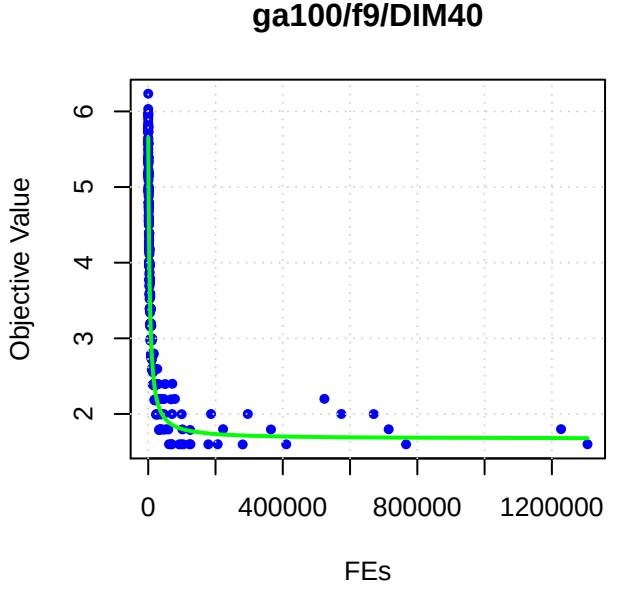
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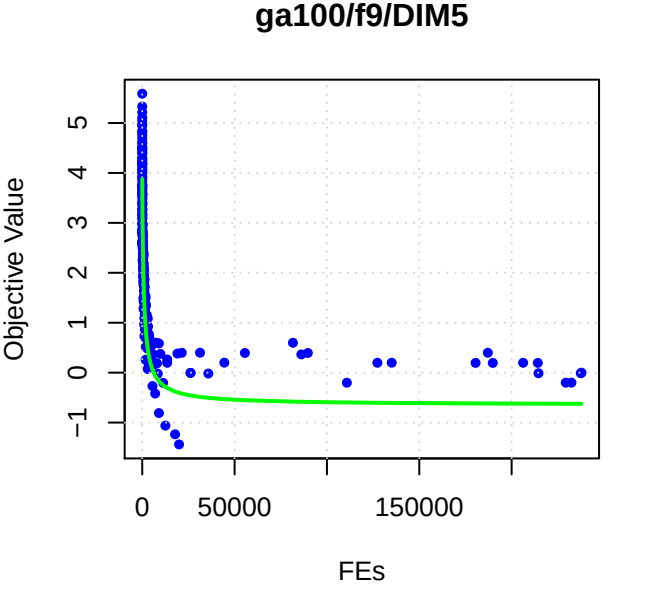
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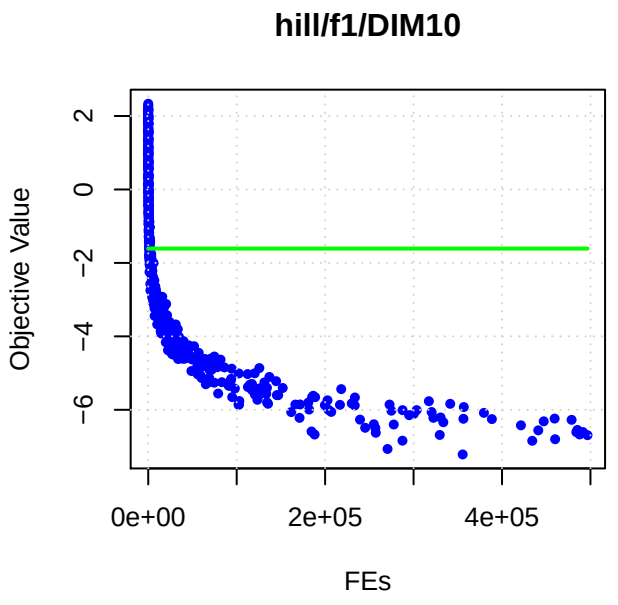
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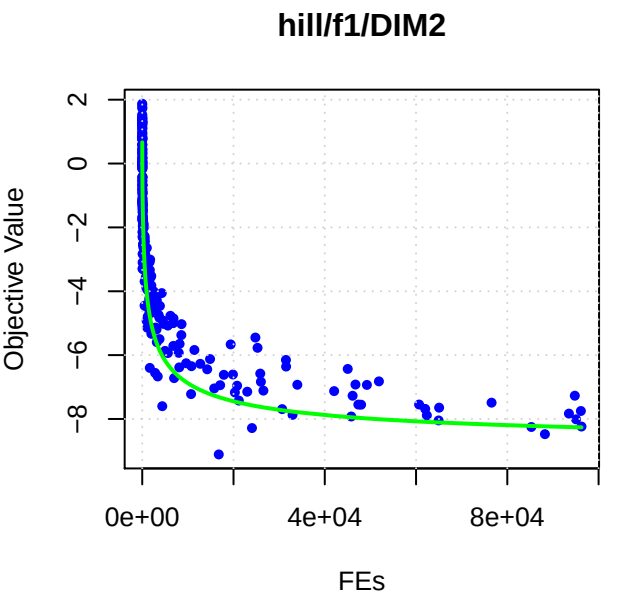
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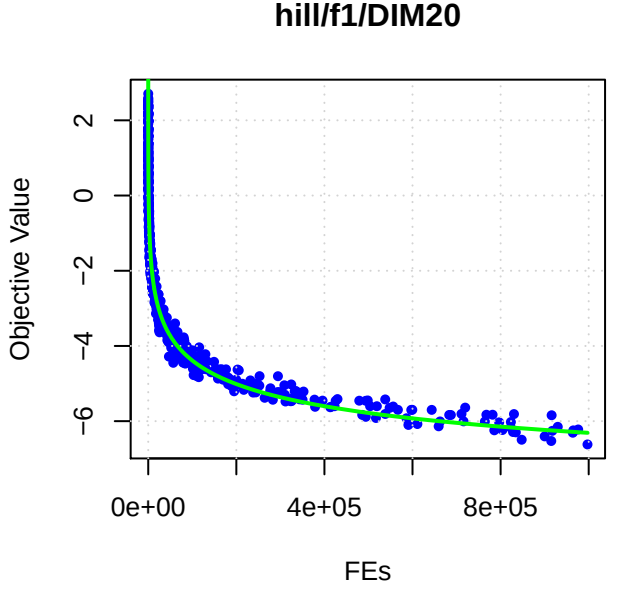
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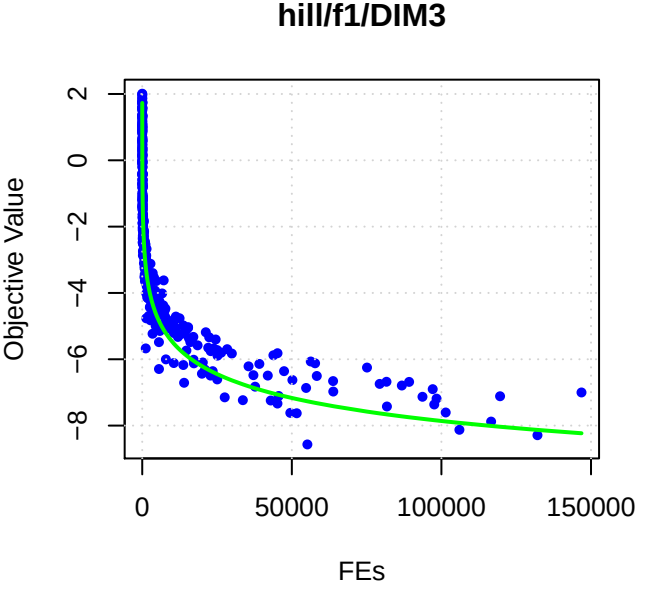
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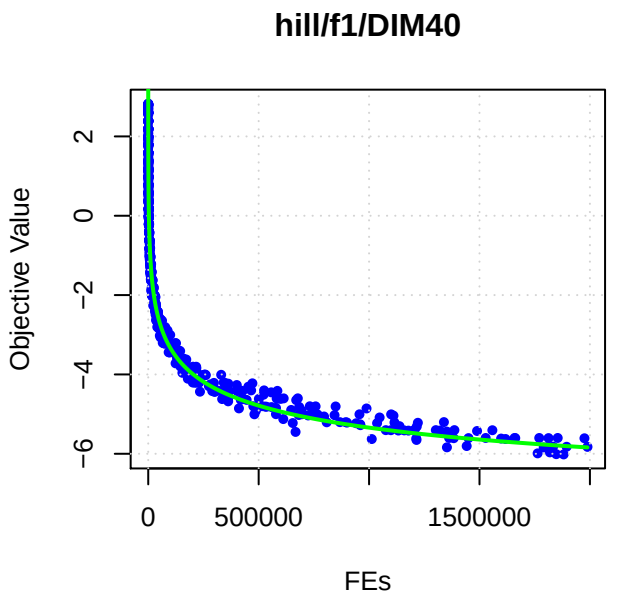
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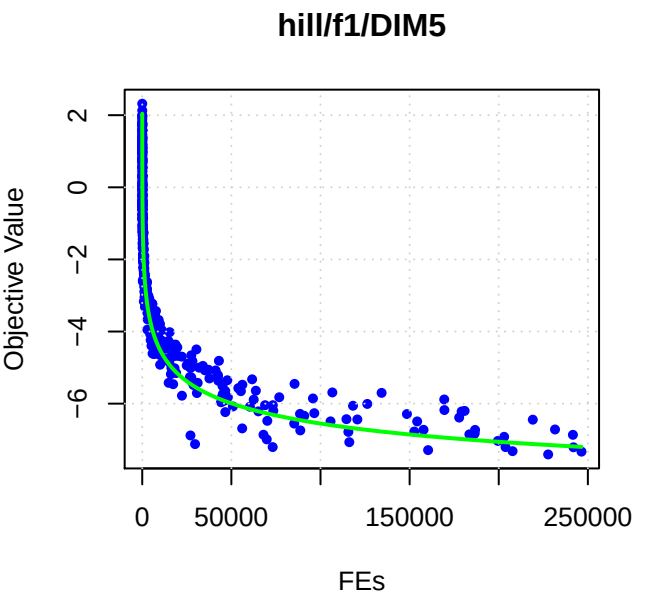
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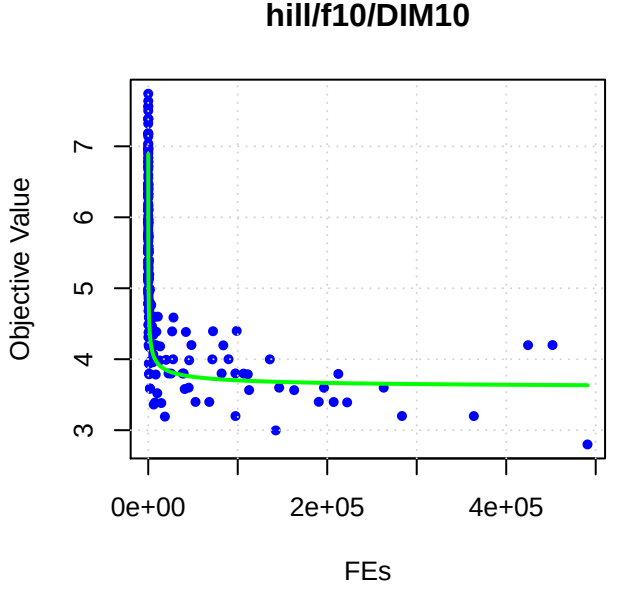
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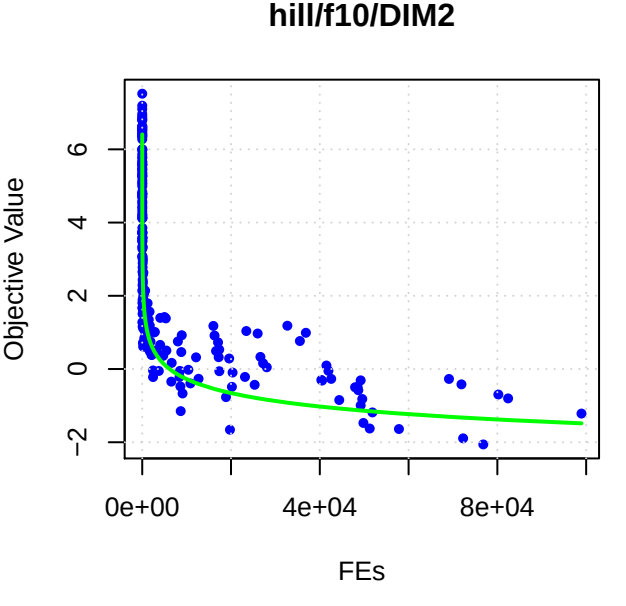
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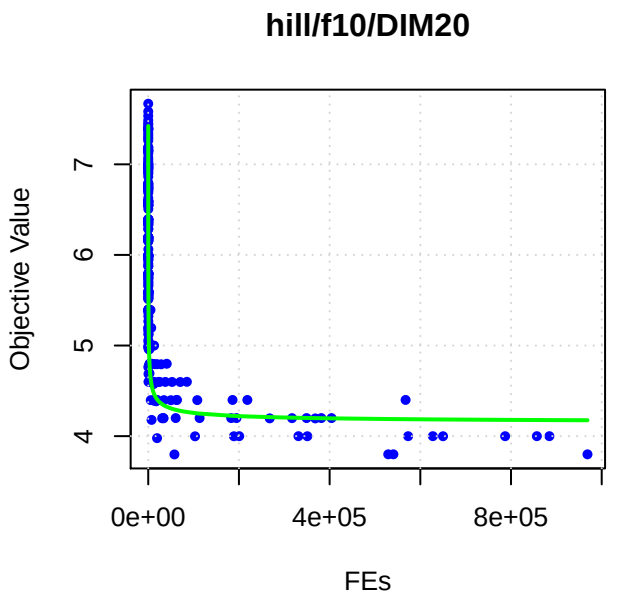
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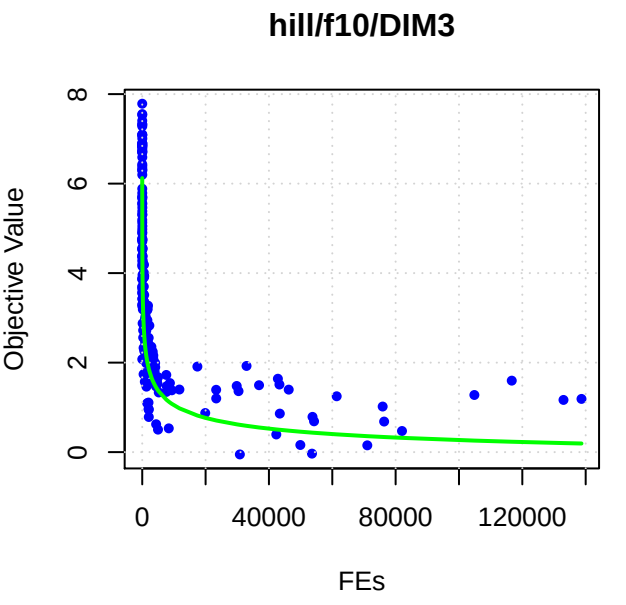
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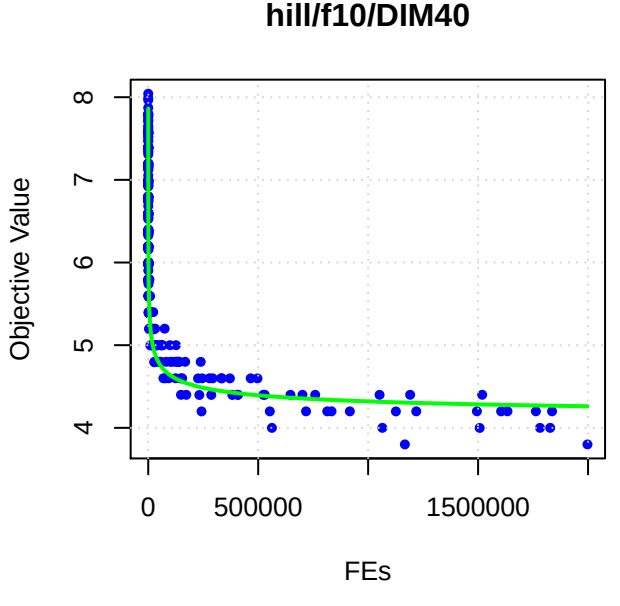
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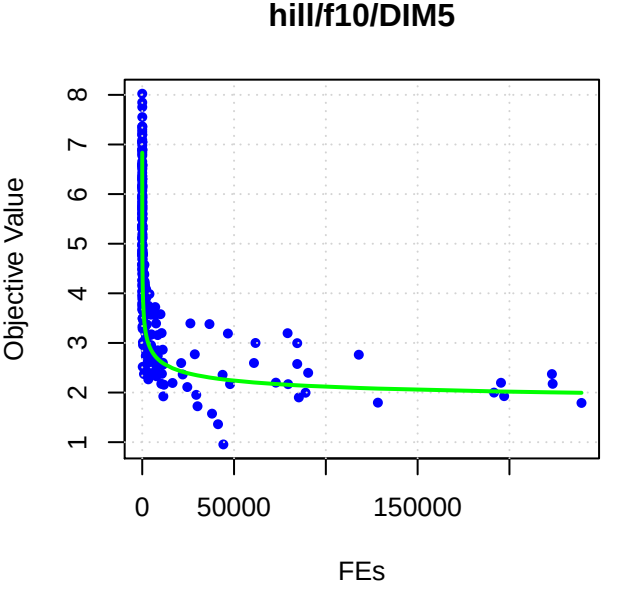
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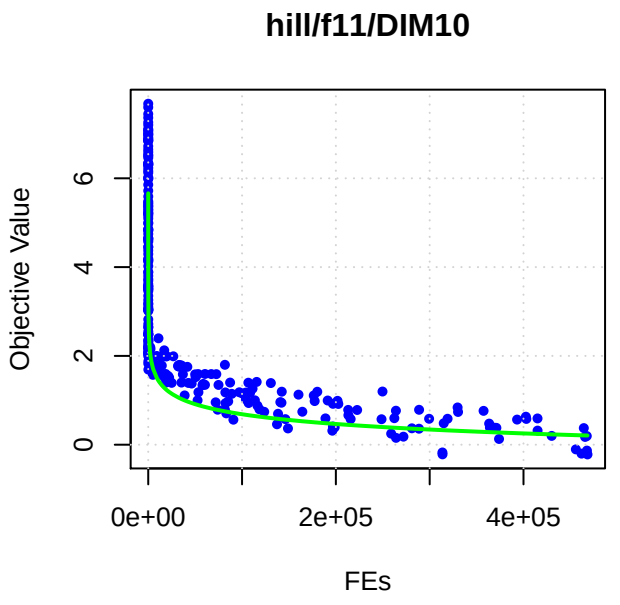
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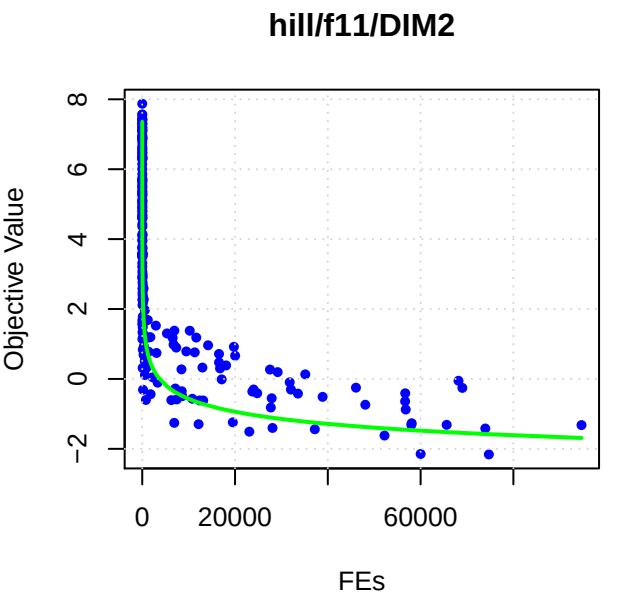
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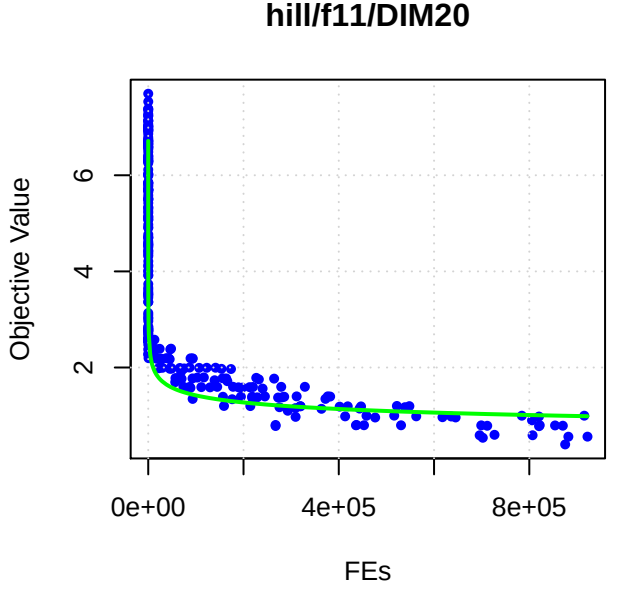
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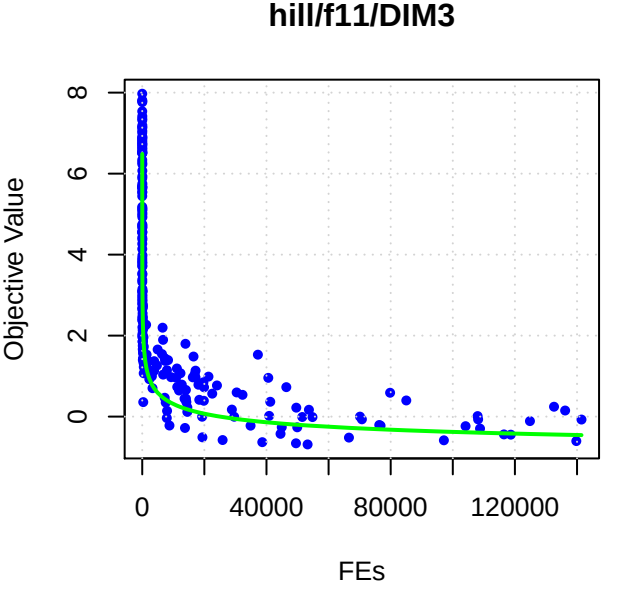
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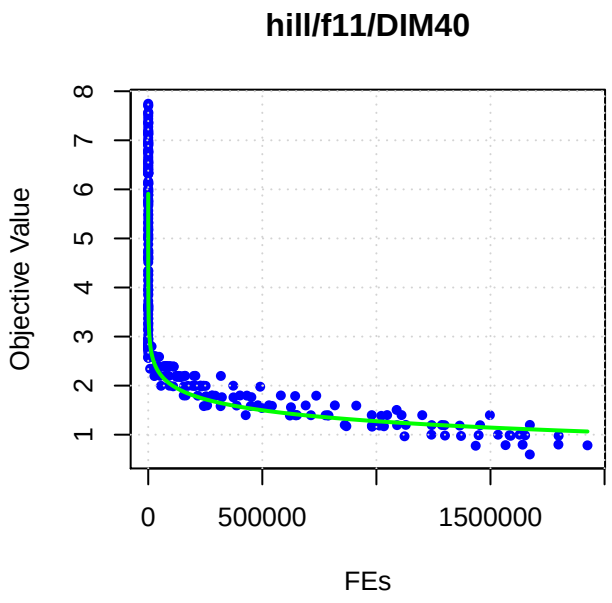
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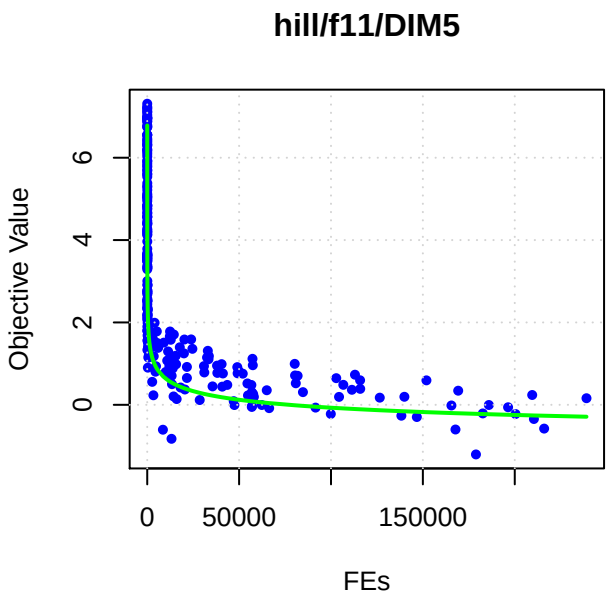
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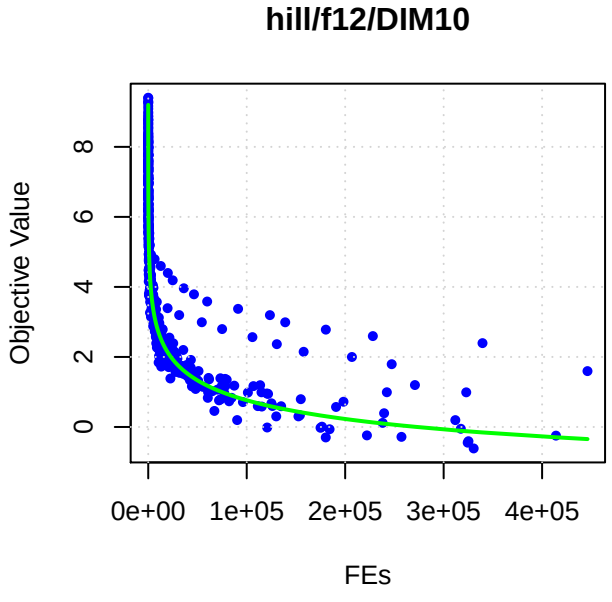
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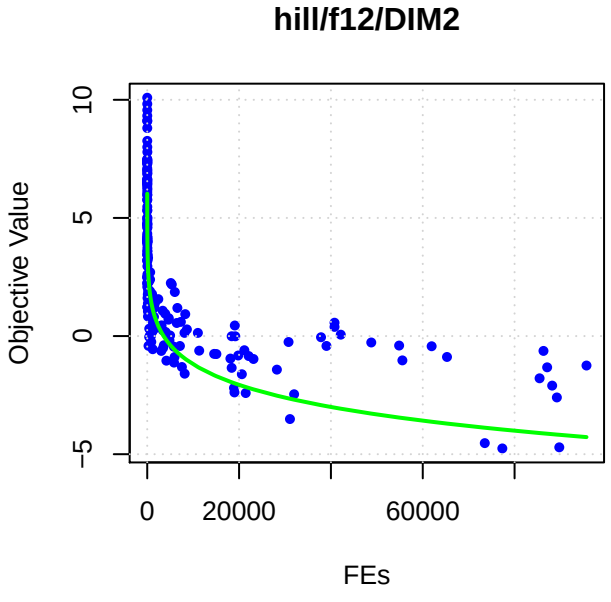
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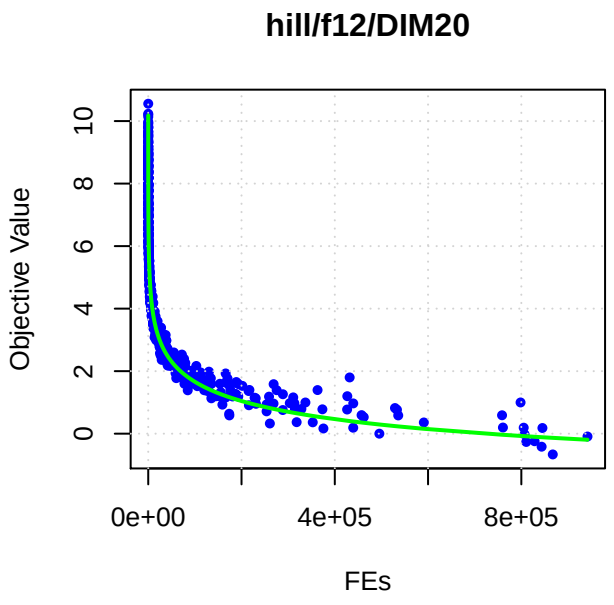
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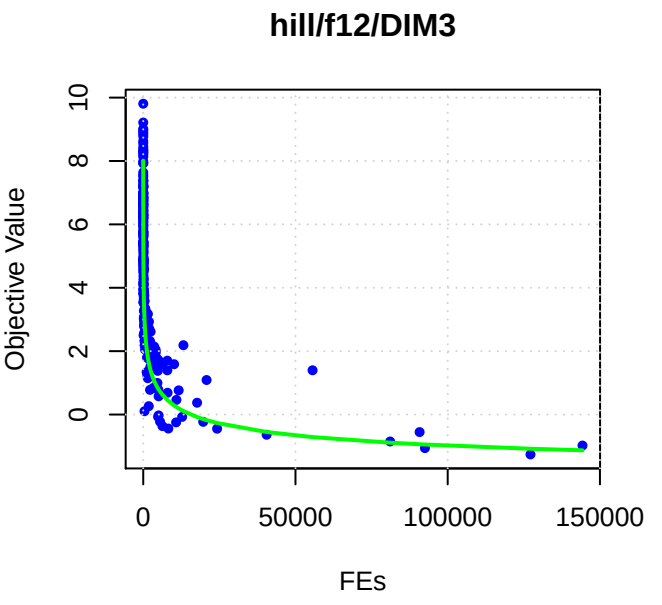
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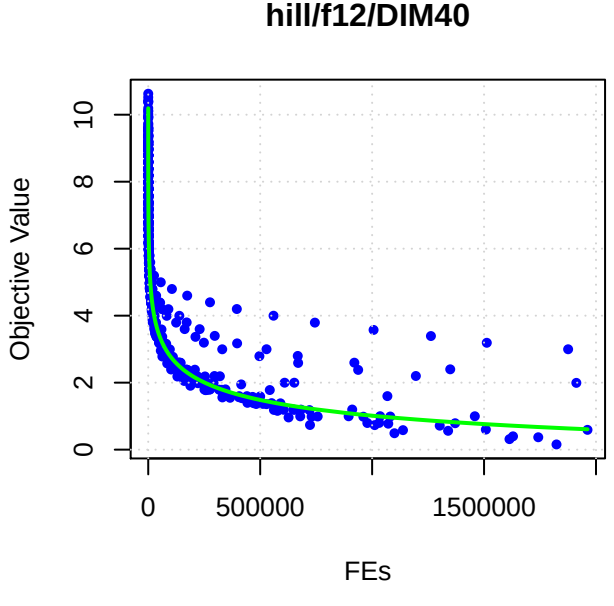
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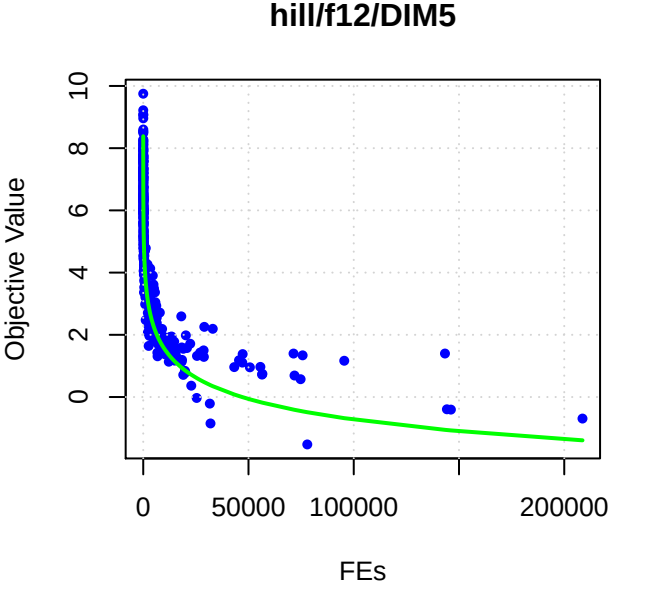
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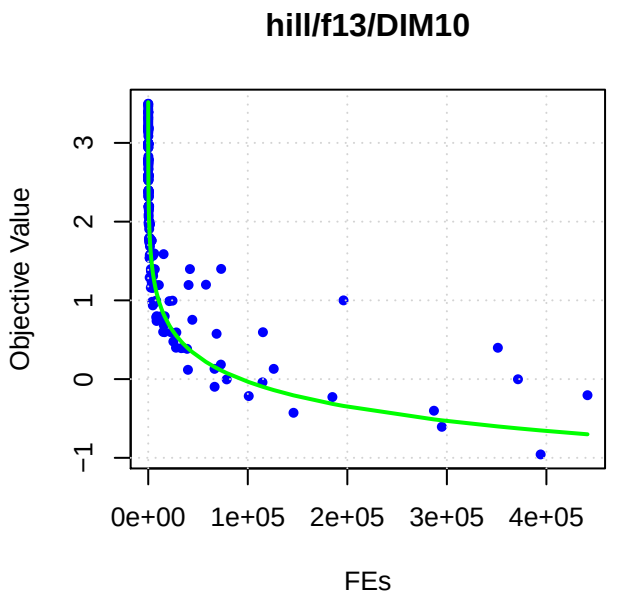
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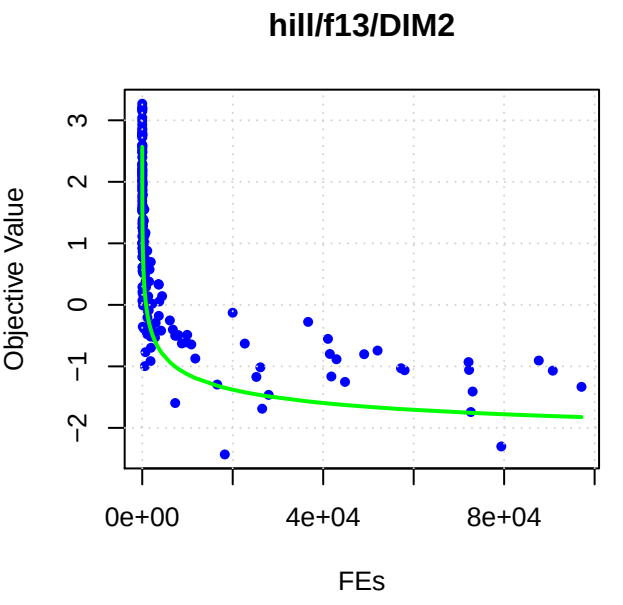
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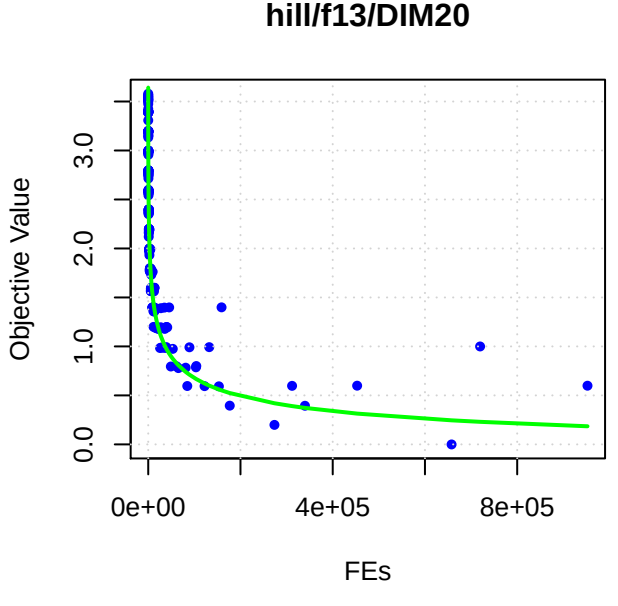
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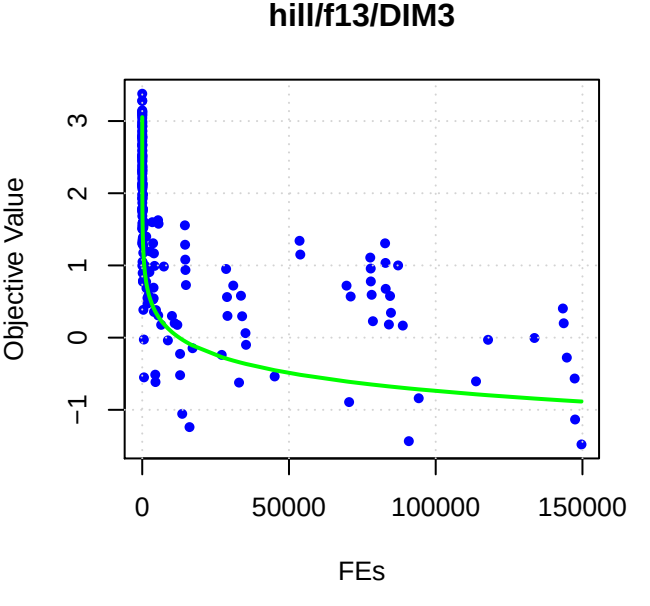
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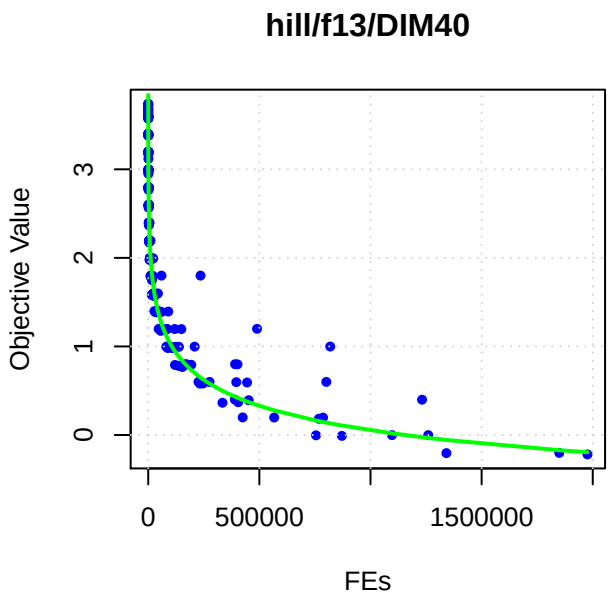
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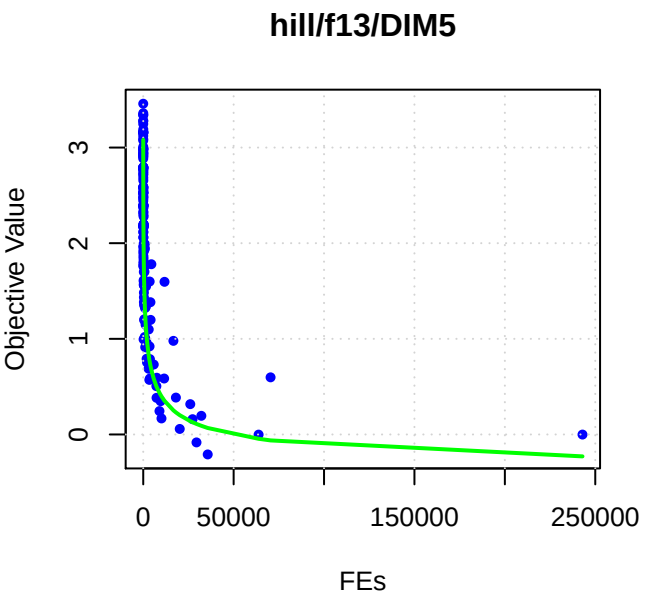
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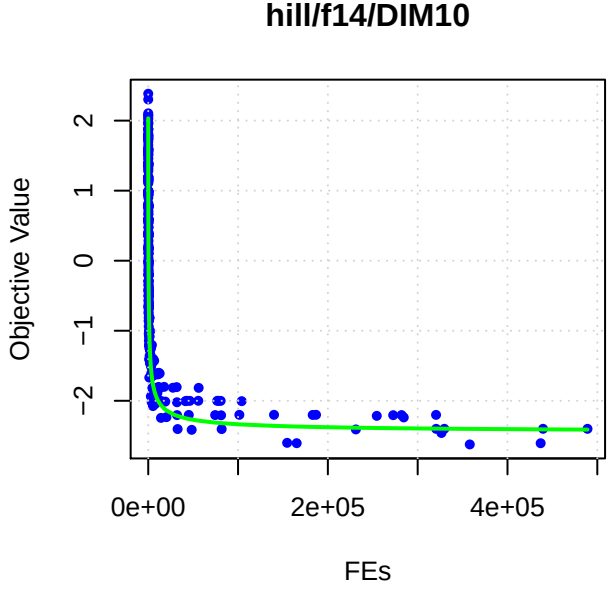
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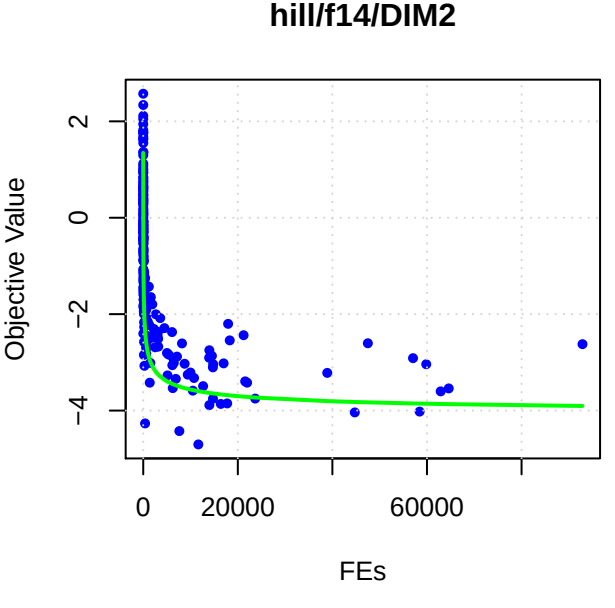
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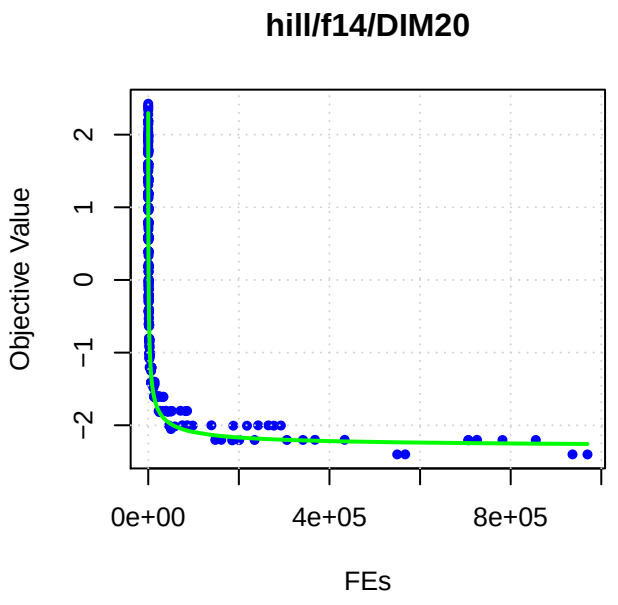
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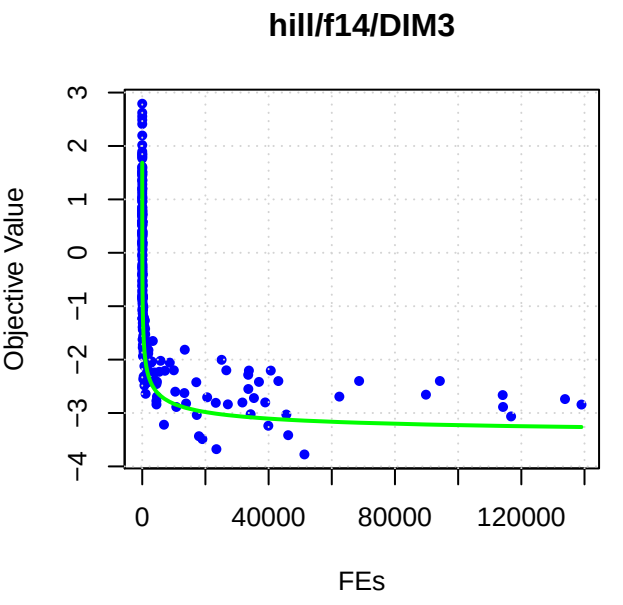
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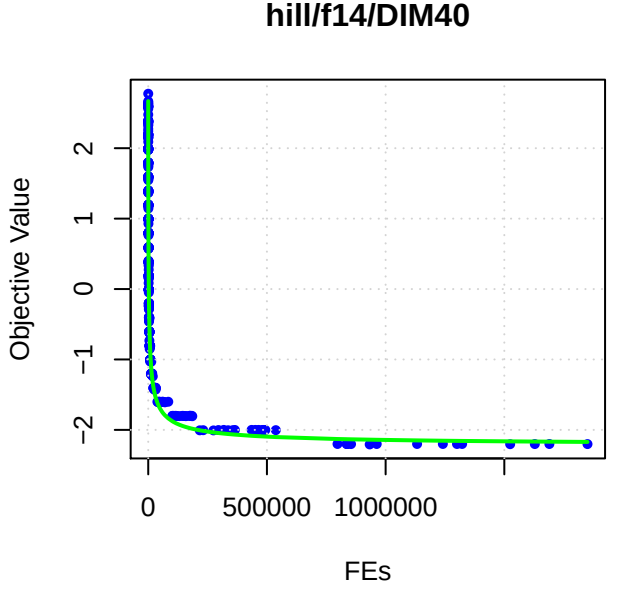
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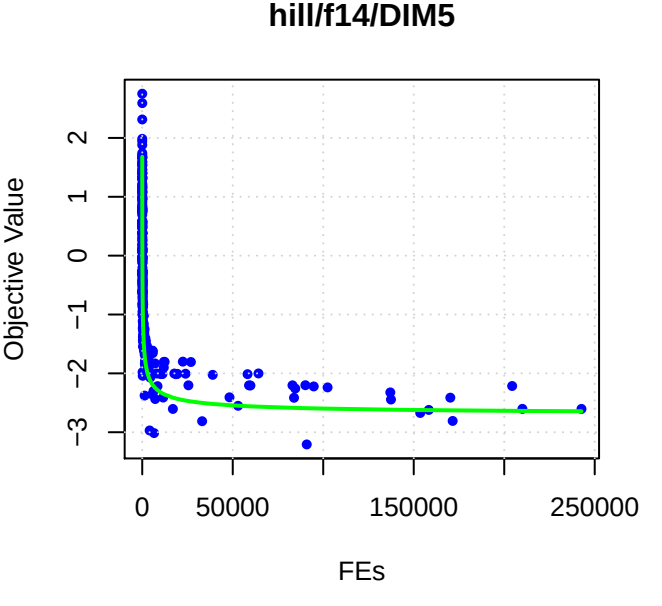
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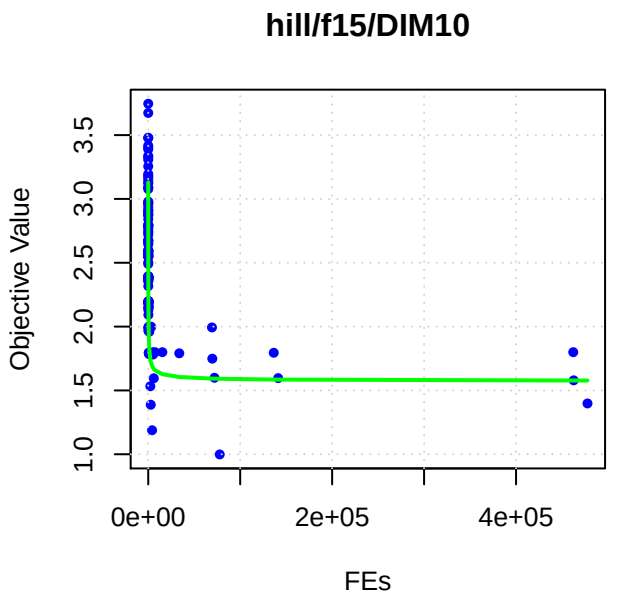
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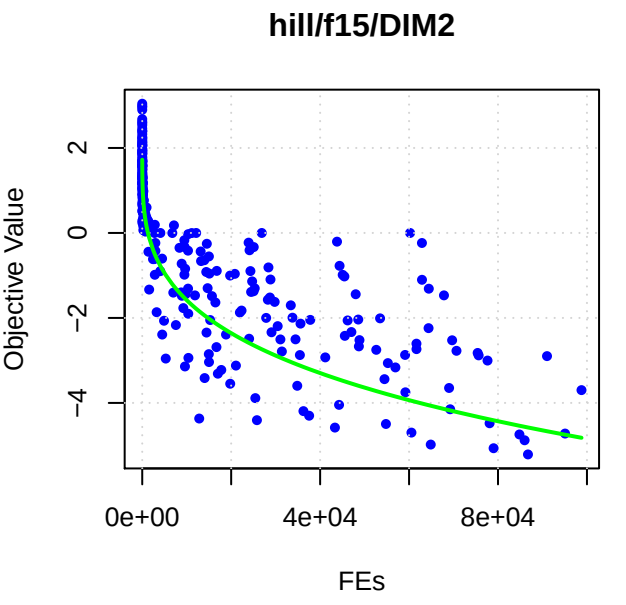
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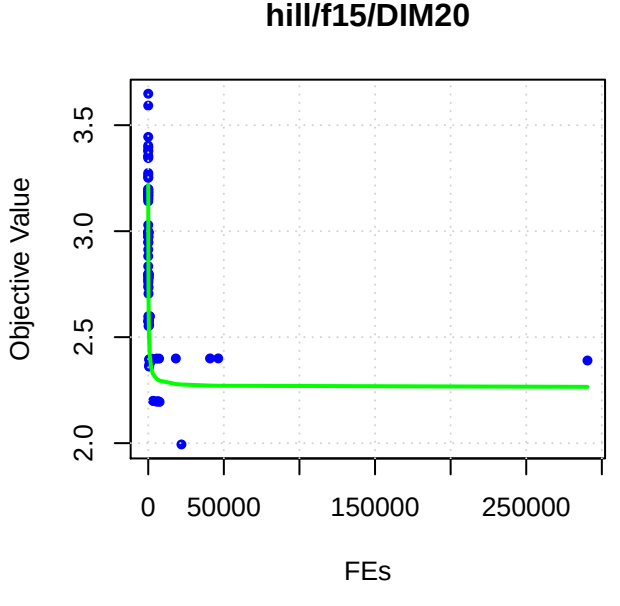
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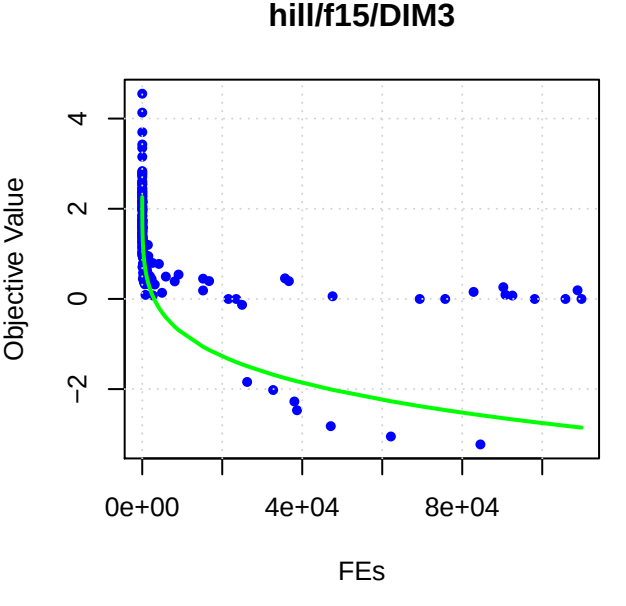
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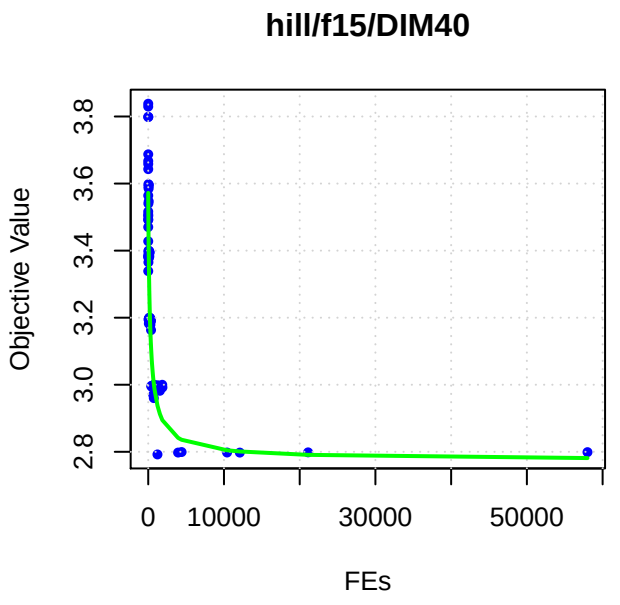
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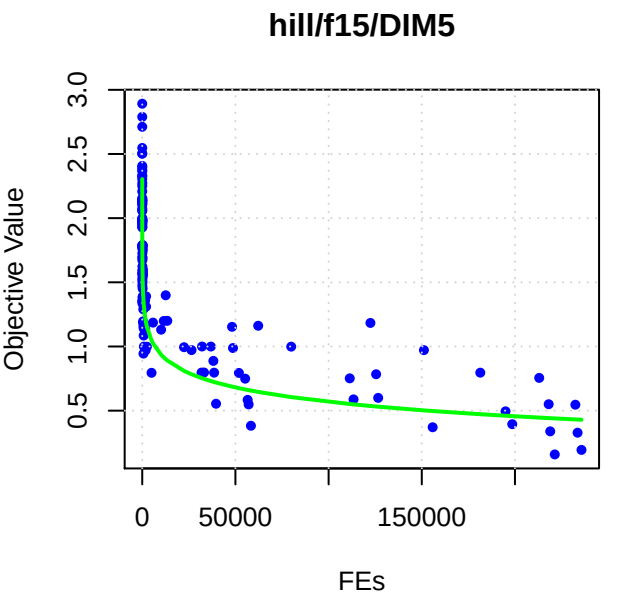
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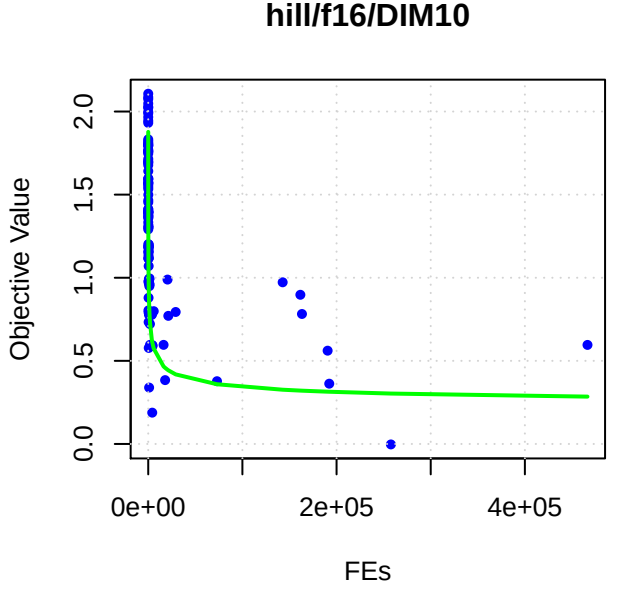
hill/f16/DIM10
Objective Value
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1.5
2.0
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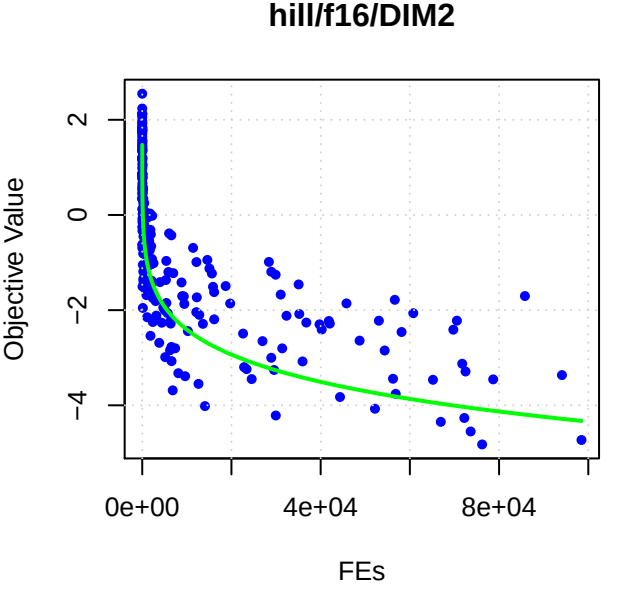
2e+05
4e+05
FEs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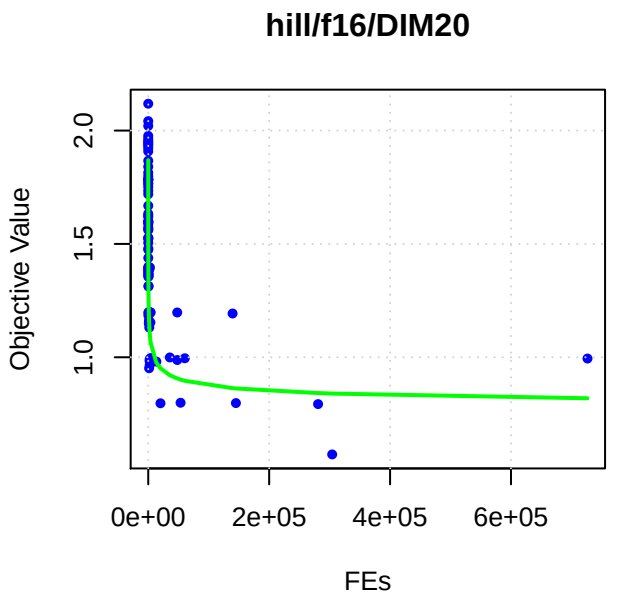
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1.0
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6e+05
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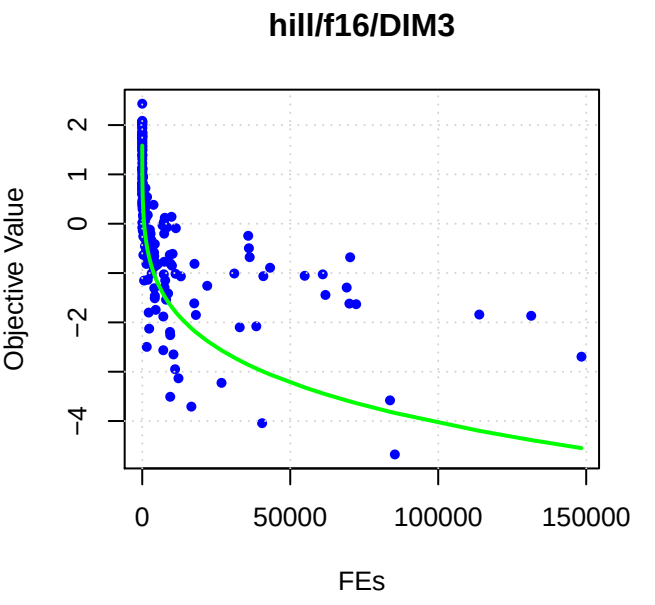
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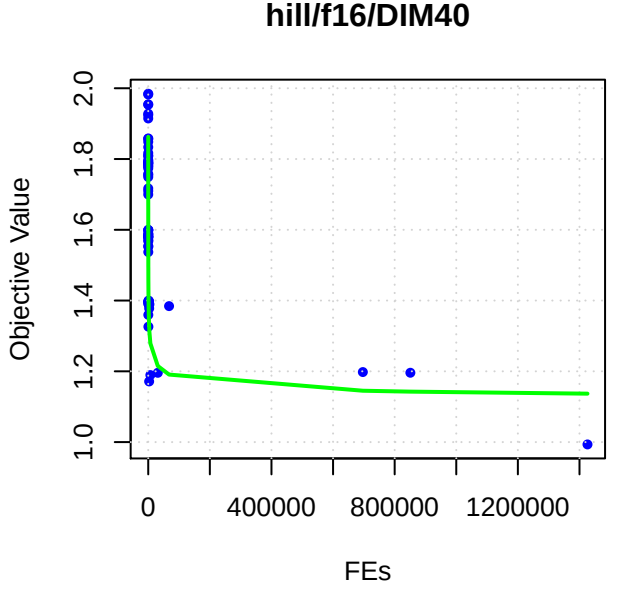
FEs


hill/f16/DIM40
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1.4
1.2
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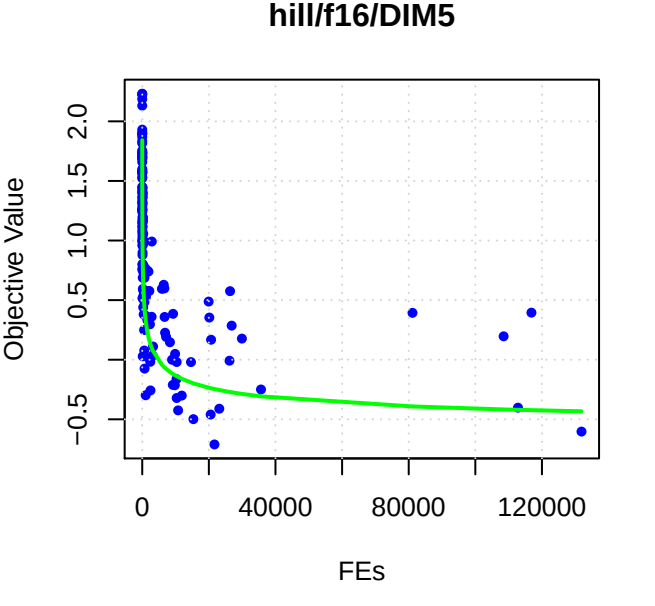
FEs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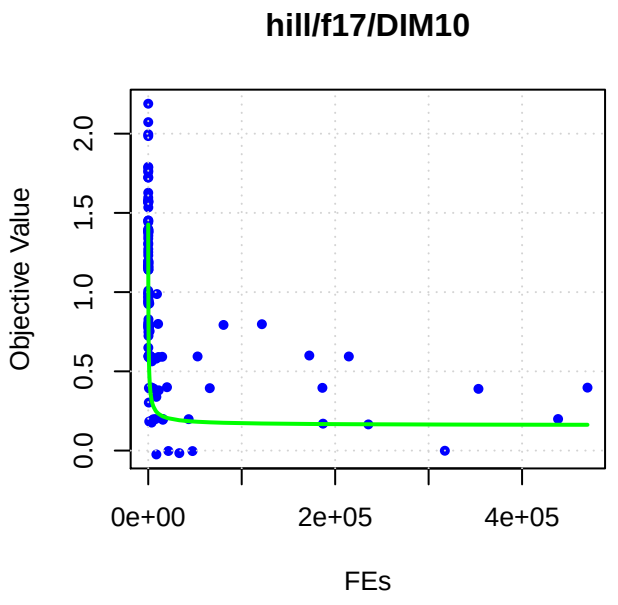
FEs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1.5
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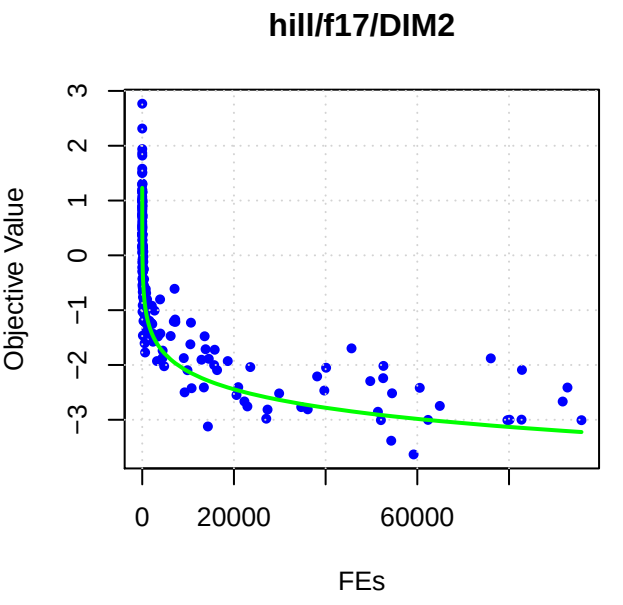
FEs


hill/f17/DIM2
Objective Value
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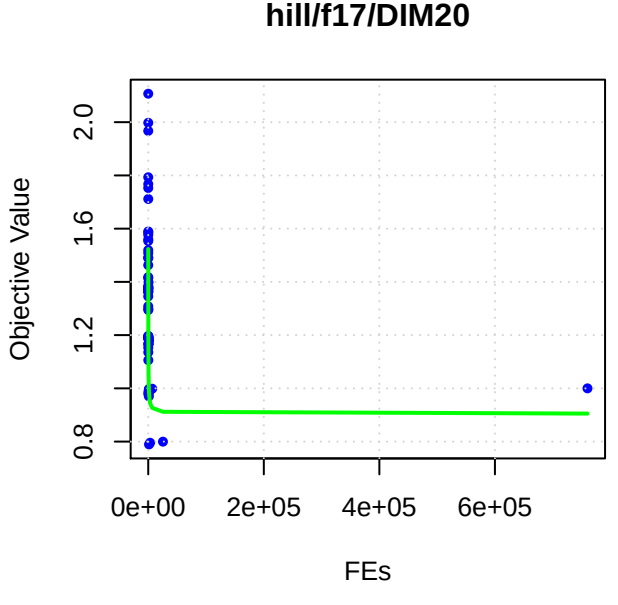
FEs


hill/f17/DIM20
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1.6
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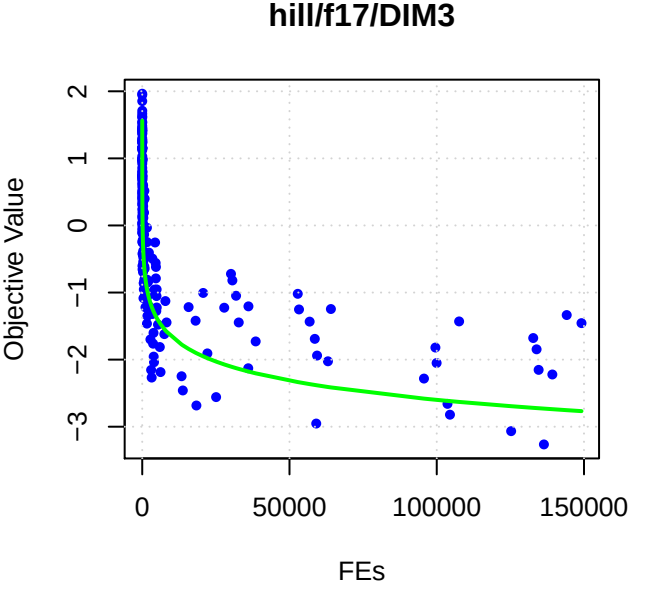
6e+05
FEs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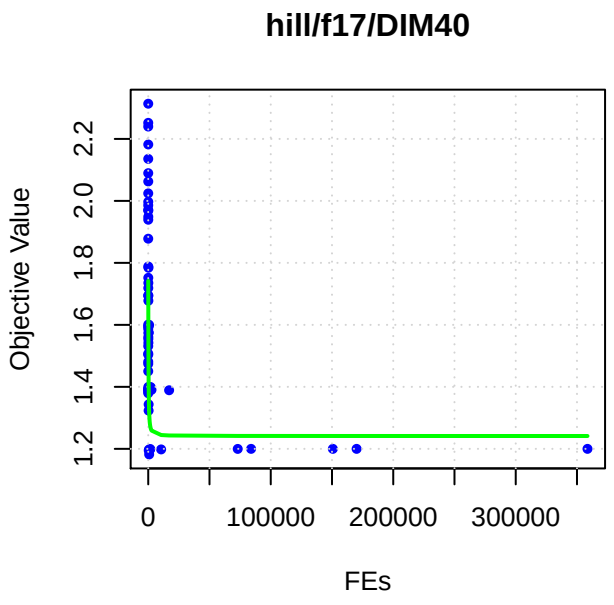
FEs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1.8
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2.2
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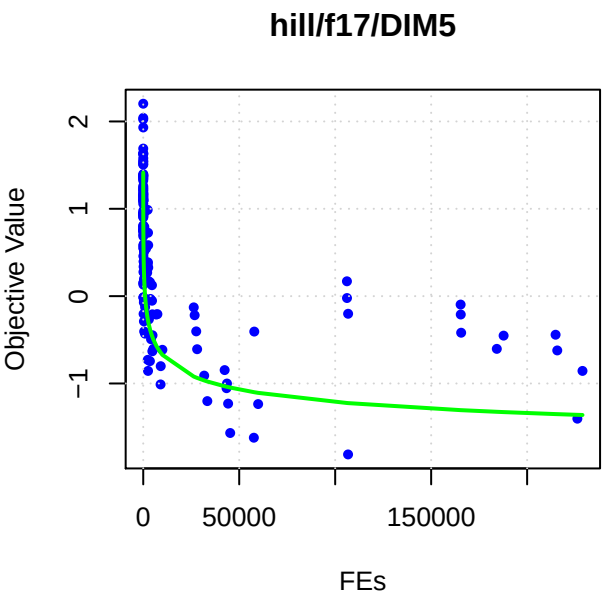
100000
200000
300000
FEs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Objective Value
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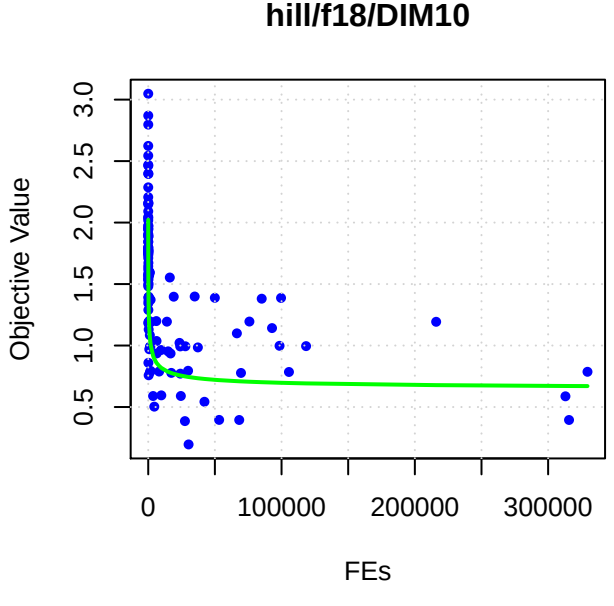
0
50000
150000
FEs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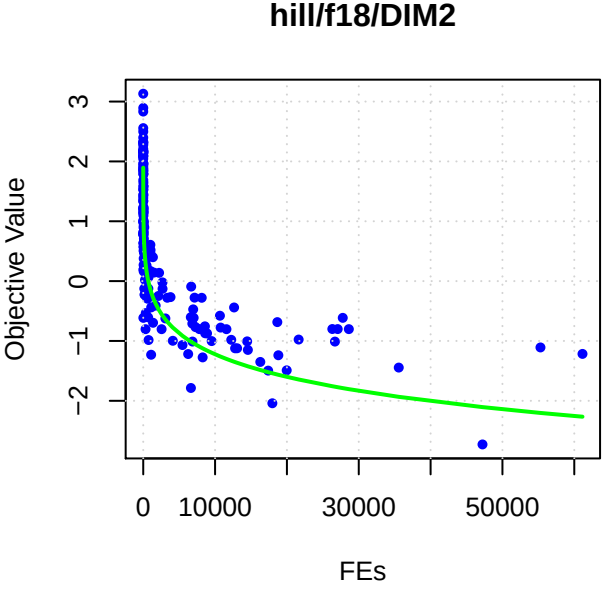
100000
200000
300000
FEs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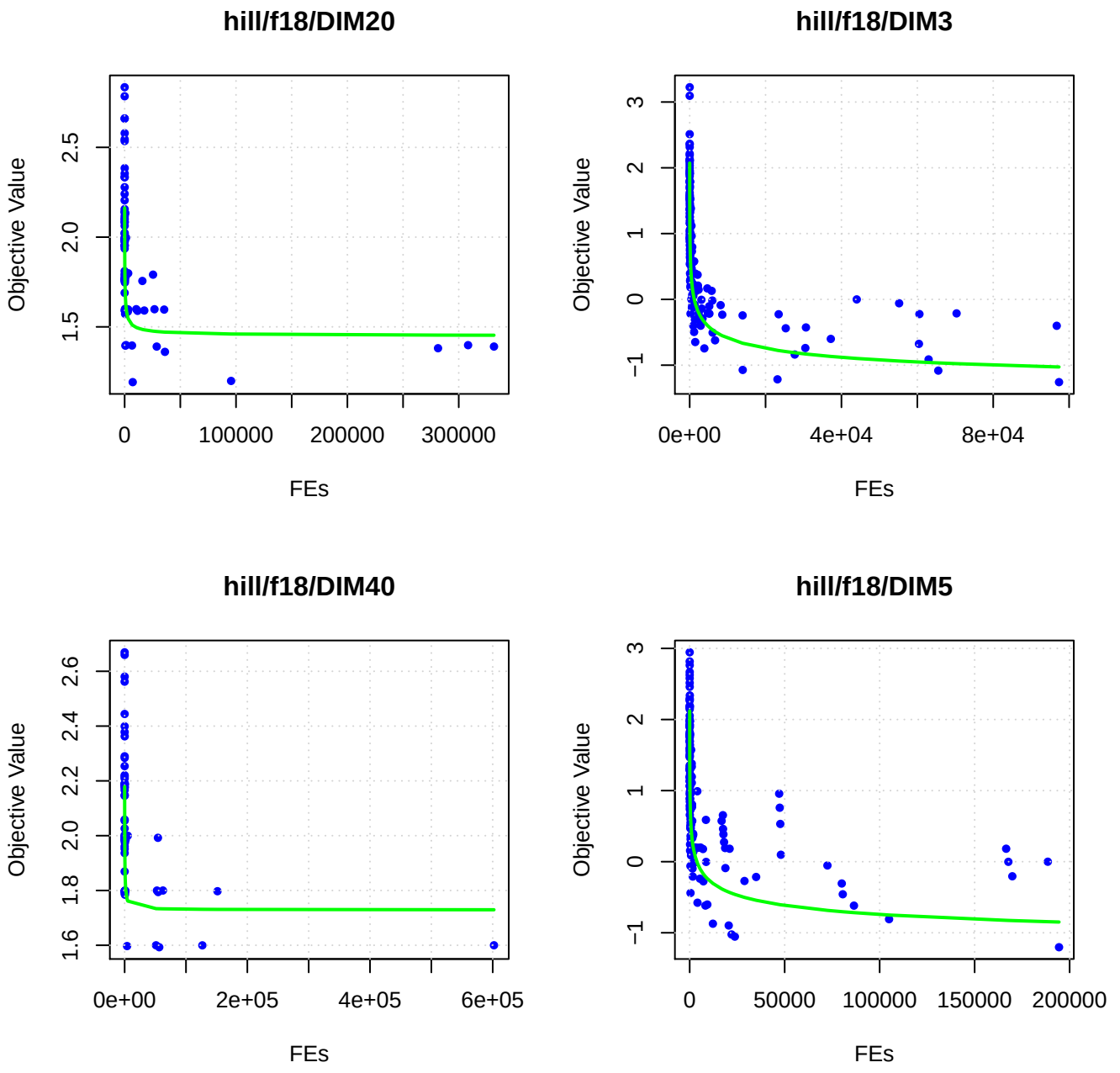
50000
FEs


hill/f18/DIM20
Objective Value
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300000
FEs
hill/f18/DIM3
Objective Value
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1
2
3
0e+00
4e+04
8e+04
FEs
hill/f18/DIM40
Objective Value
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1.8
2.0
2.2
2.4
2.6
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2e+05
4e+05
6e+05
FEs
hill/f18/DIM5
Objective Value
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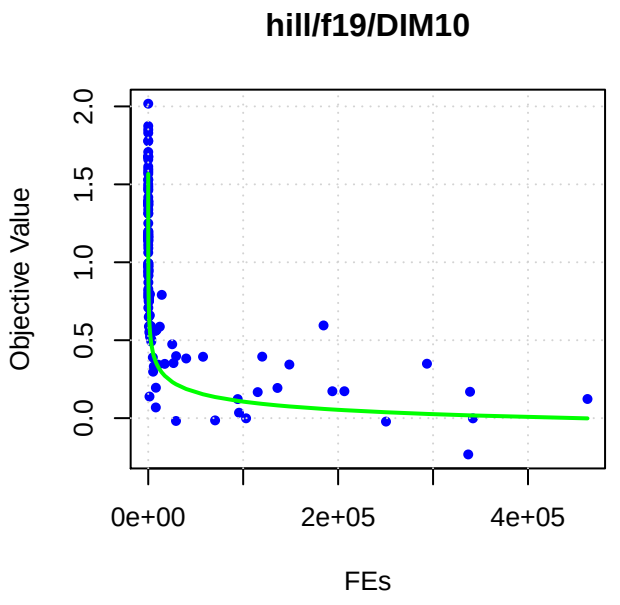
150000
200000
FEs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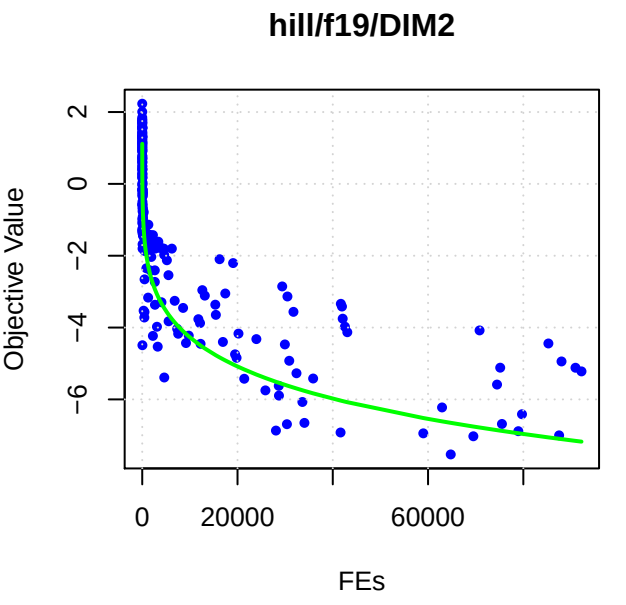
FEs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Objective Value
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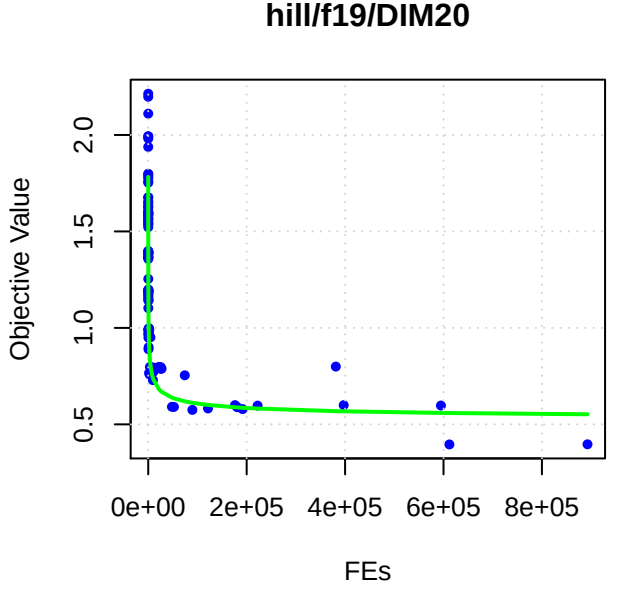
20000
60000
FEs


hill/f19/DIM20
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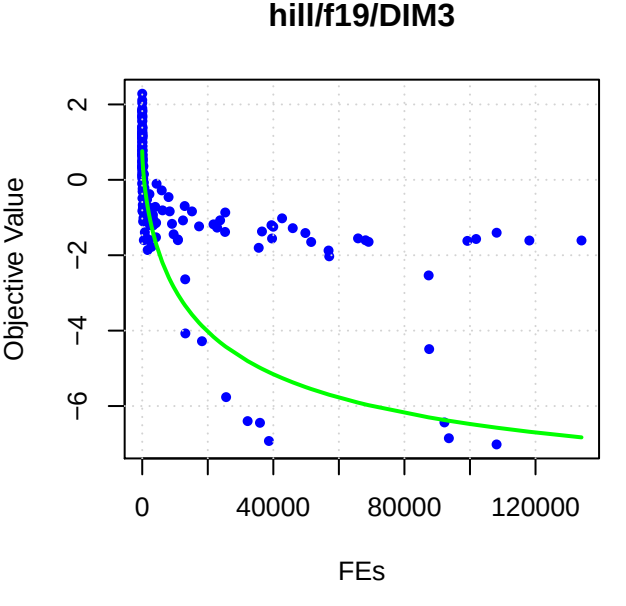
8e+05
FEs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Objective Value
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80000
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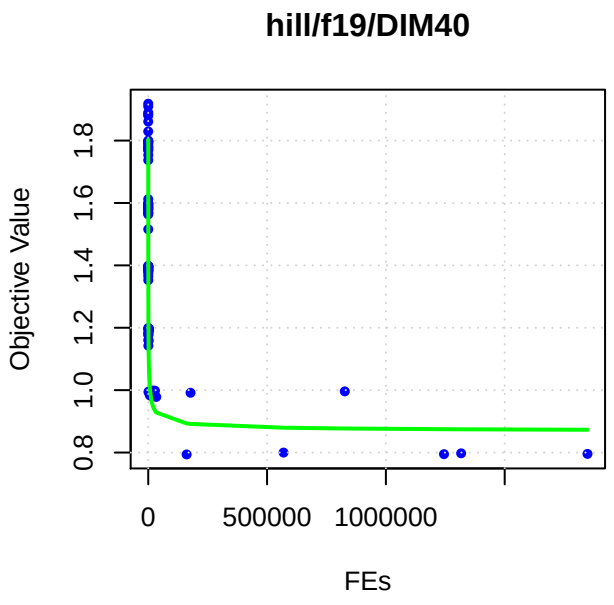
FEs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1.2
1.4
1.6
1.8
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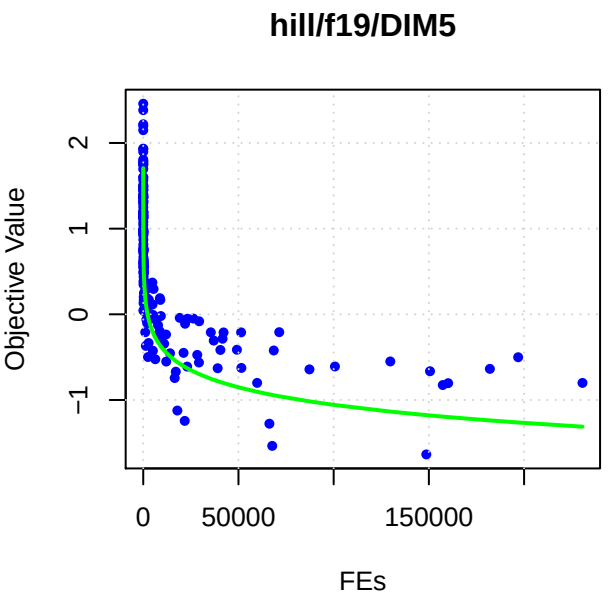
1000000
FEs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2
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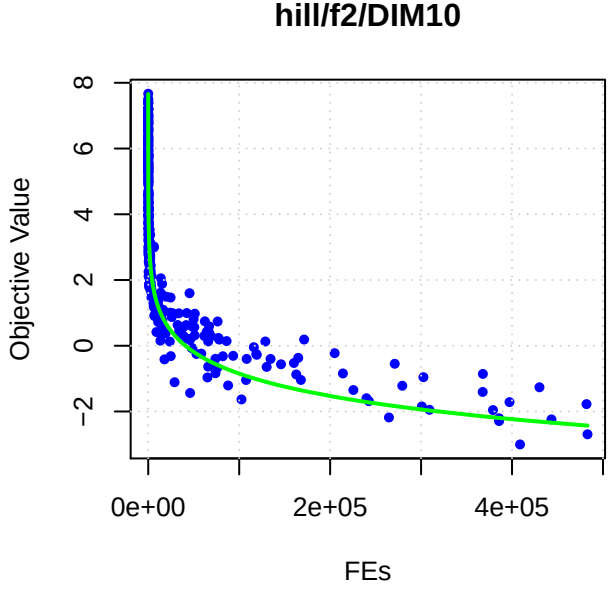
50000
150000
FEs


hill/f2/DIM10
Objective Value
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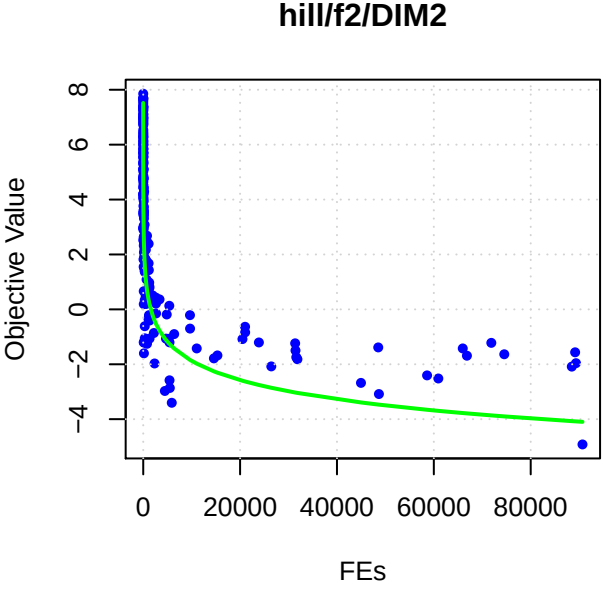
4e+05
FEs


hill/f2/DIM2
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60000
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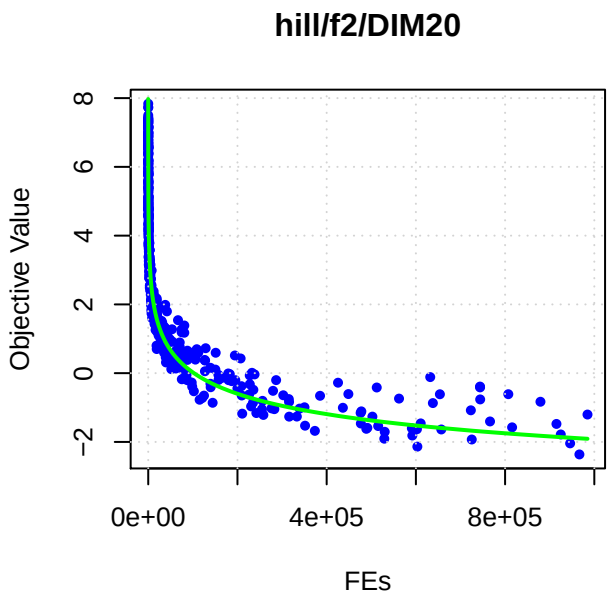
FEs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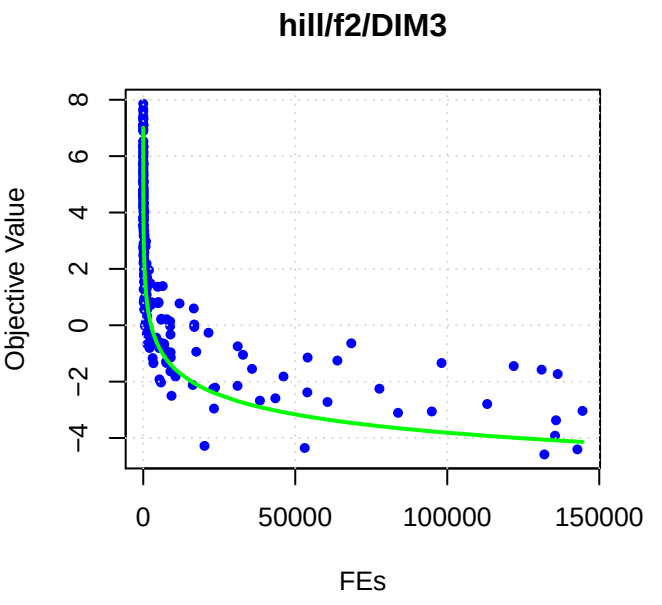
hill/f2/DIM3
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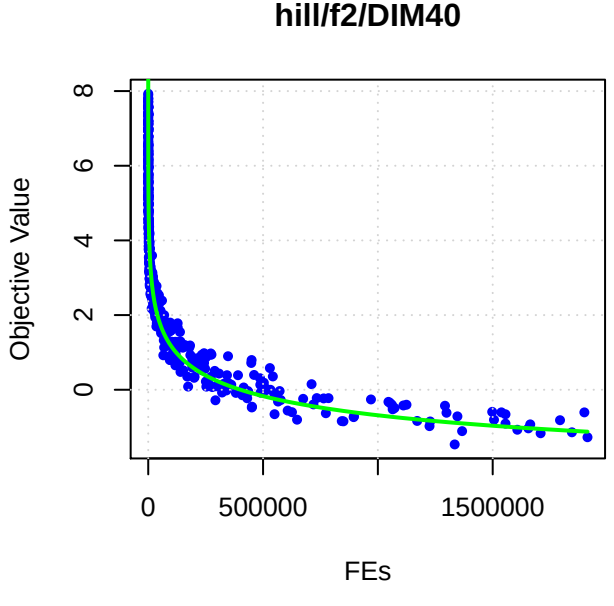
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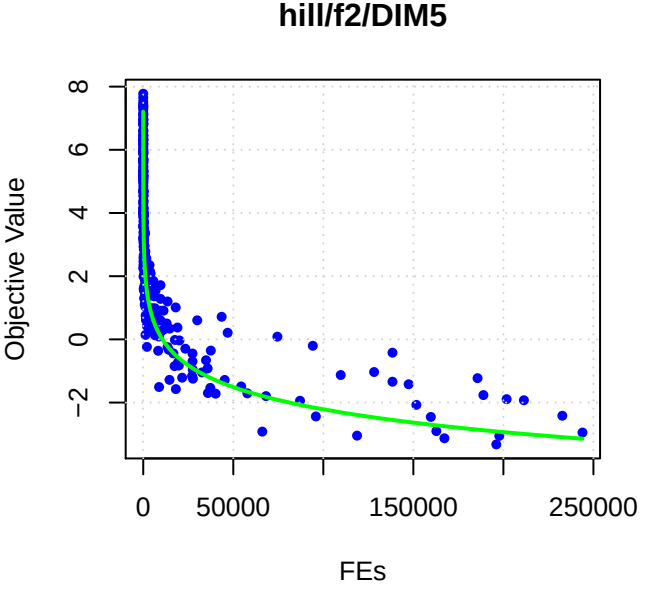
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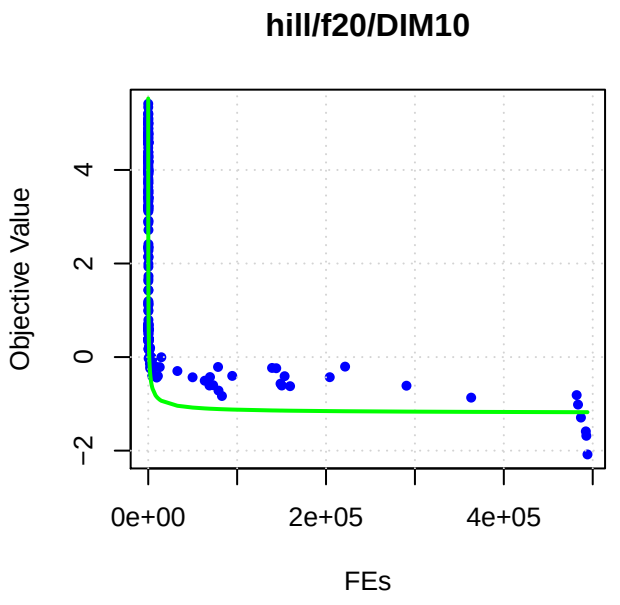
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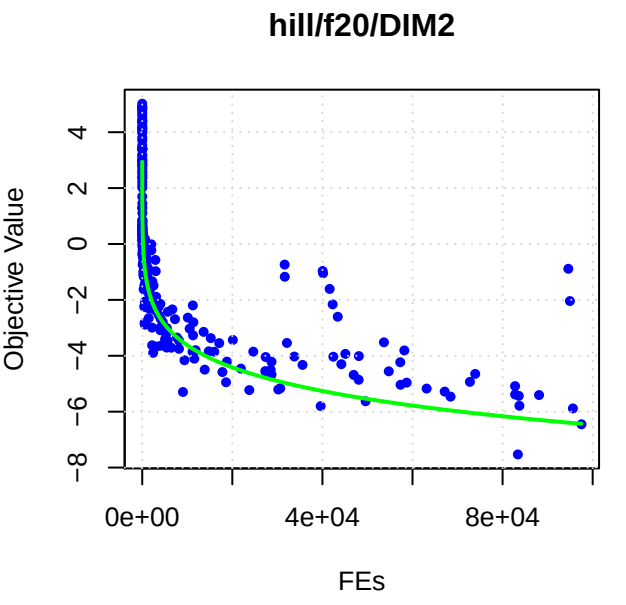
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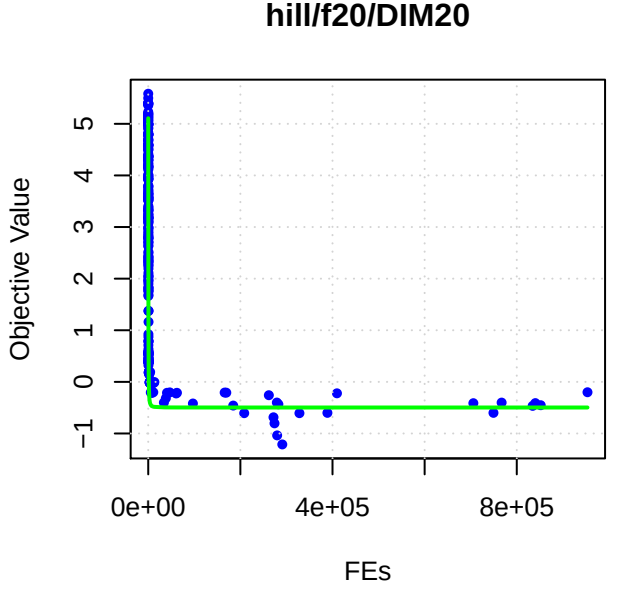
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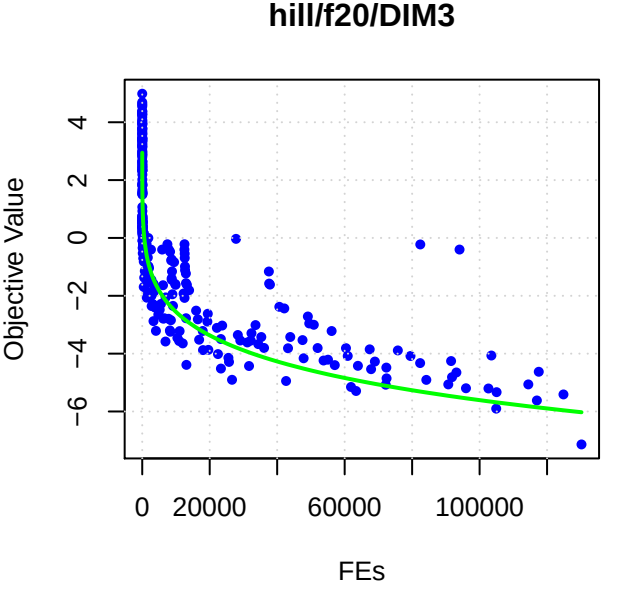
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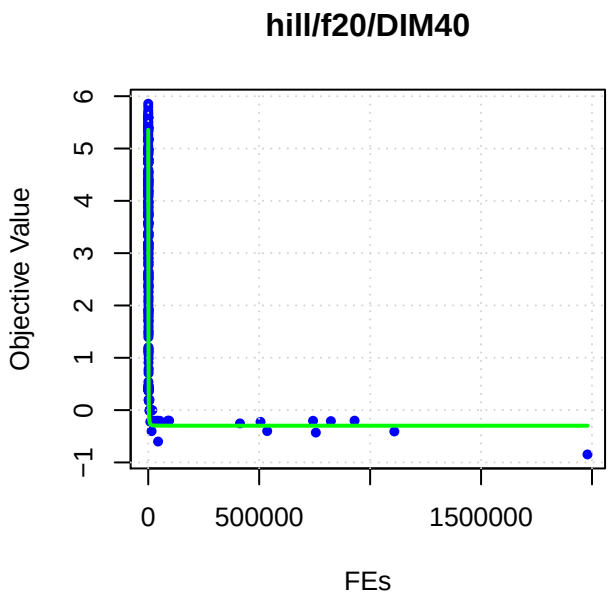
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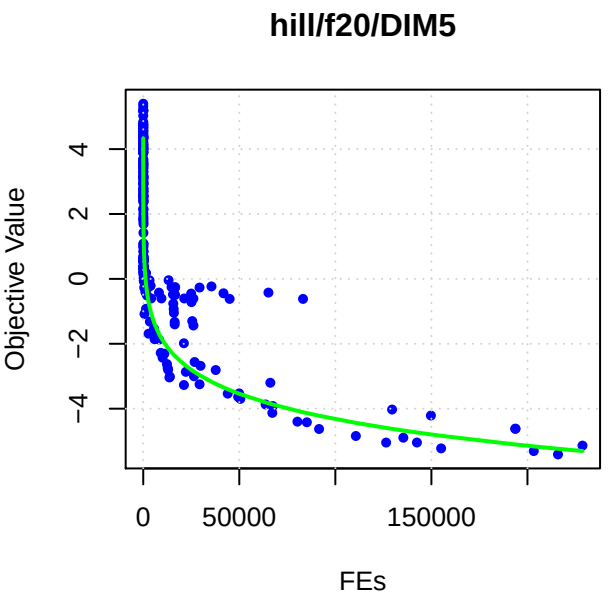
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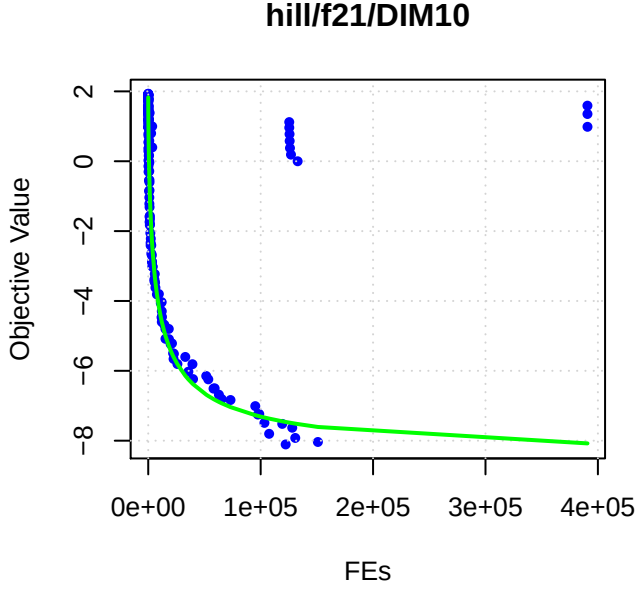
hill/f21/DIM10
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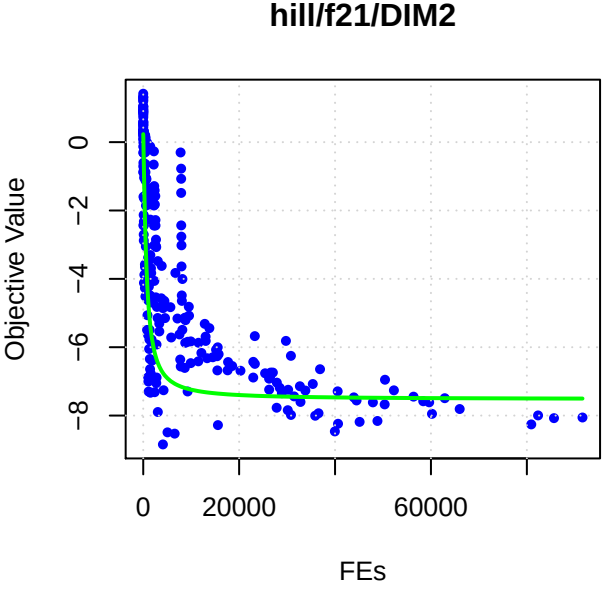
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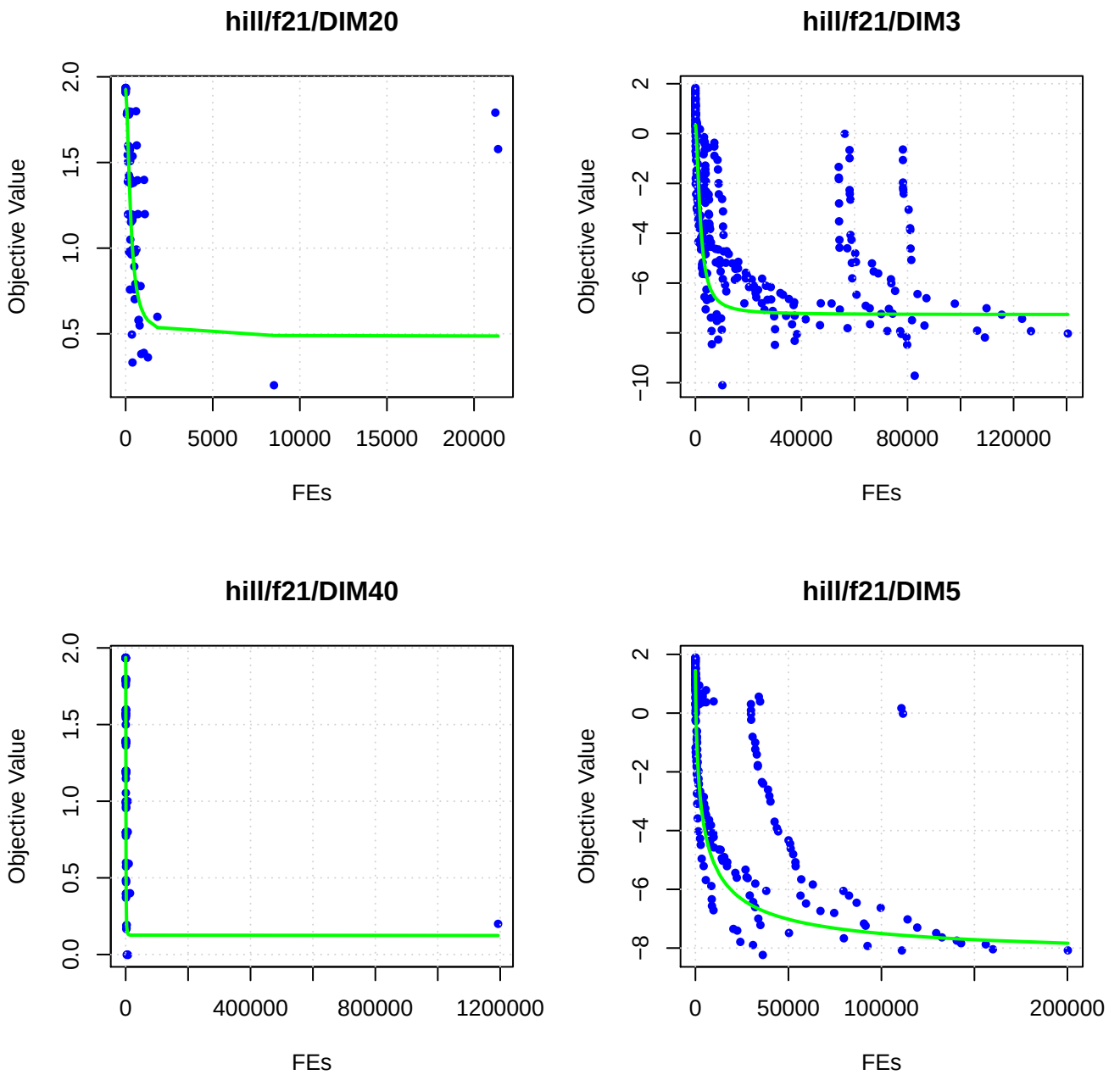
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Objective Value
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1.5
2.0
hill/f21/DIM3
Objective Value
FEs
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40000
80000
120000
2
0
−2
−4
−6
−10
hill/f21/DIM40
Objective Value
FEs
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400000
800000
1200000
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1.0
1.5
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hill/f21/DIM5
Objective Value
FEs
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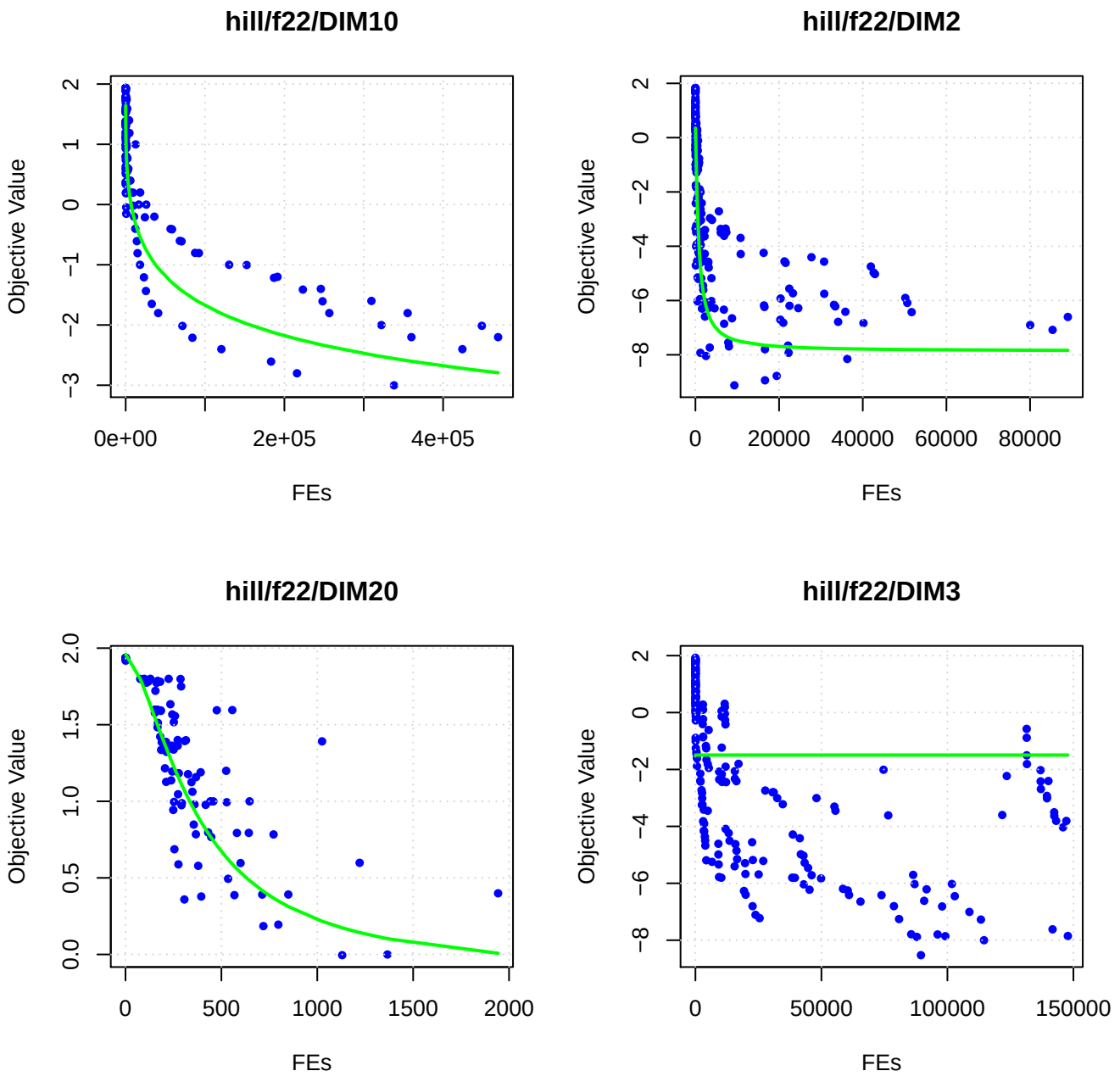
−8


hill/f22/DIM10
Objective Value
FEs
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4e+05
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−1
−2
−3
hill/f22/DIM2
Objective Value
FEs
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20000
40000
60000
80000
2
0
−2
−4
−6
−8
hill/f22/DIM20
Objective Value
FEs
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1500
2000
2.0
1.5
1.0
0.5
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hill/f22/DIM3
Objective Value
FEs
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150000
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−4
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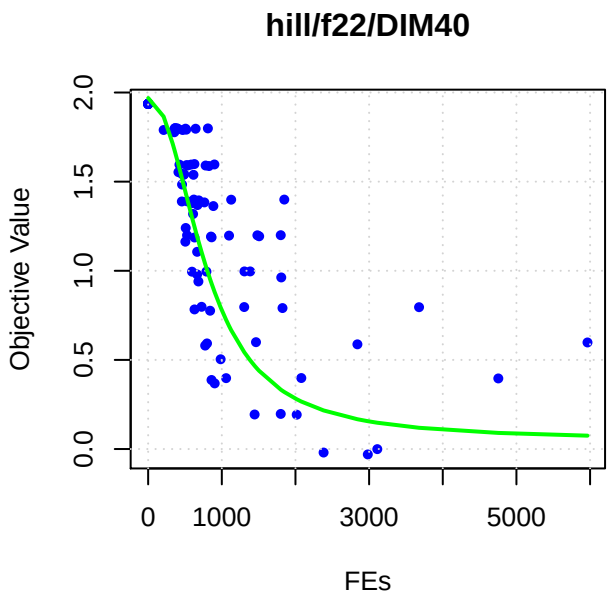
−8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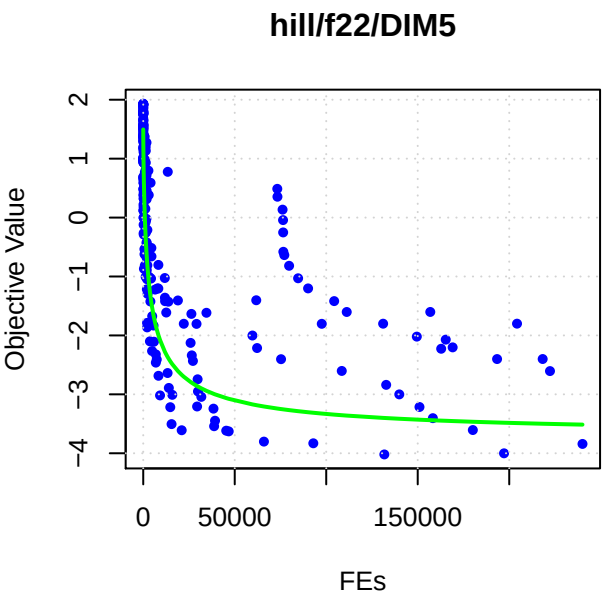
hill/f22/DIM5
Objective Value
FEs
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0
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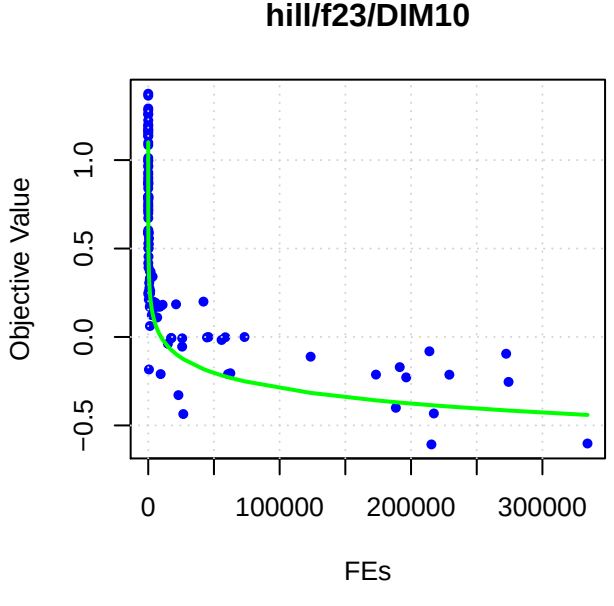
150000


hill/f23/DIM10
Objective Value
FEs
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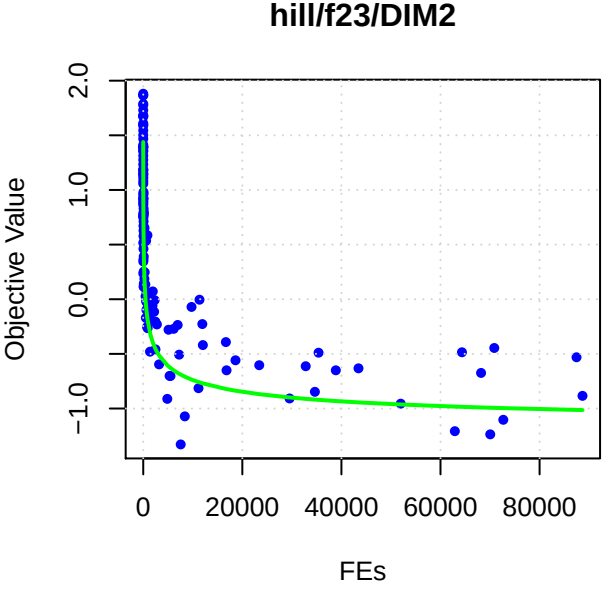
0.5
1.0
0
100000
200000
300000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Objective Value
FEs
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1.0
2.0
0
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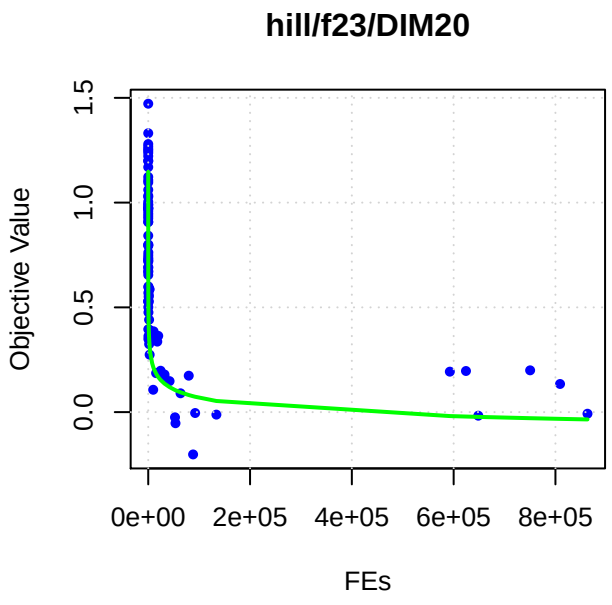
40000
60000
80000


hill/f23/DIM20
Objective Value
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1.0
1.5
0e+00
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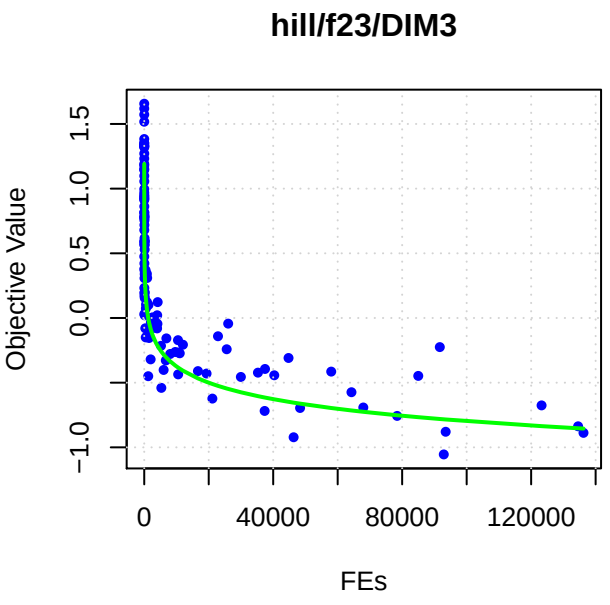
4e+05
6e+05
8e+05
FEs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1.0
1.5
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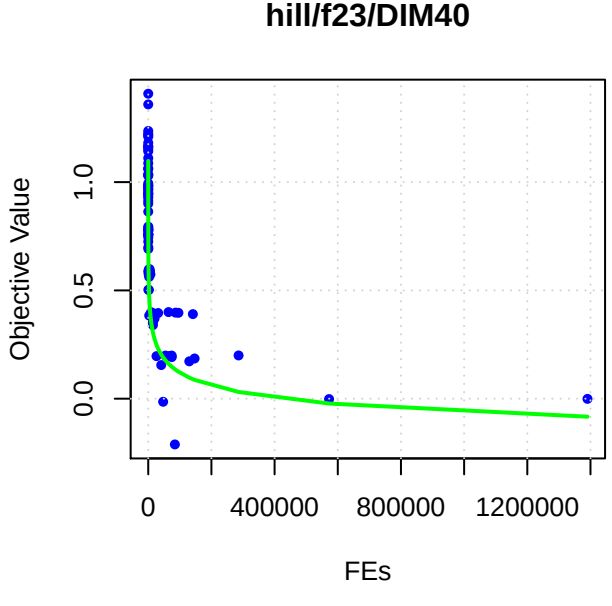
80000
120000
FEs


hill/f23/DIM40
Objective Value
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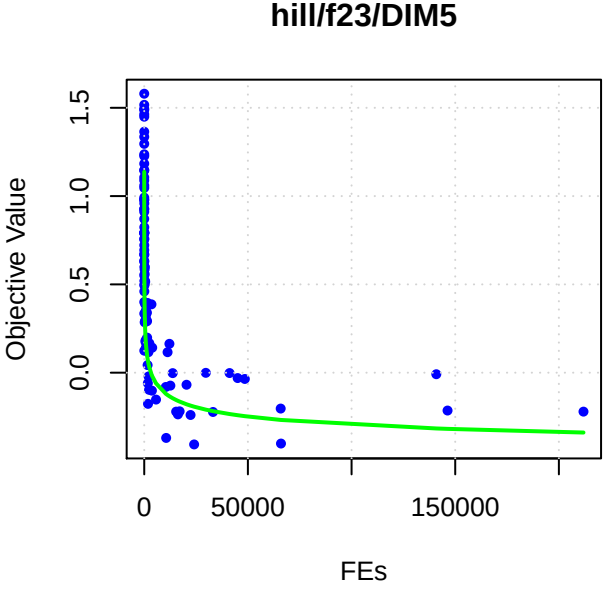
800000
1200000
FEs


hill/f23/DIM5
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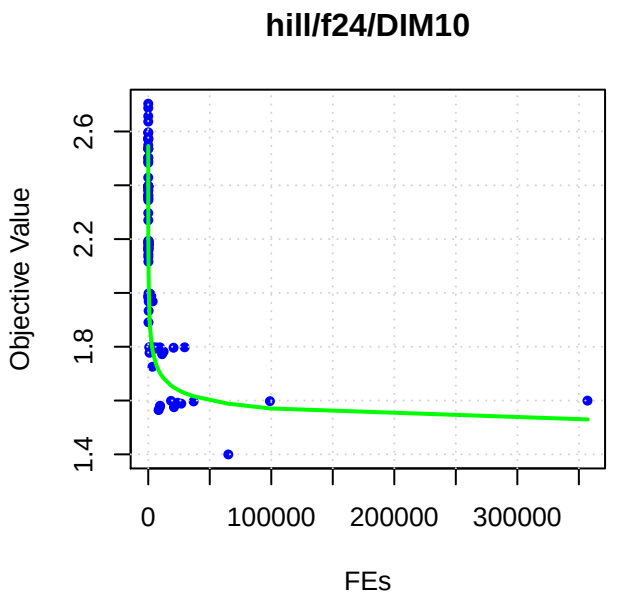
0.5
1.0
1.5
0
50000
150000
FEs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2.6
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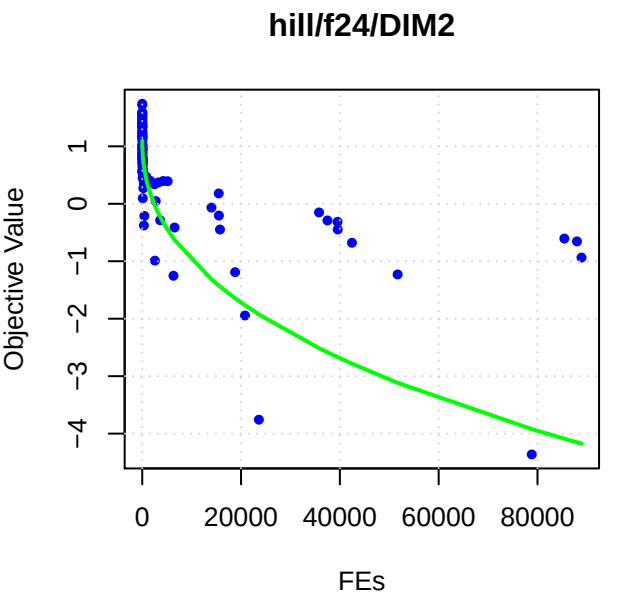
100000
200000
300000
FEs


hill/f24/DIM2
Objective Value
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−2
−1
0
1
0
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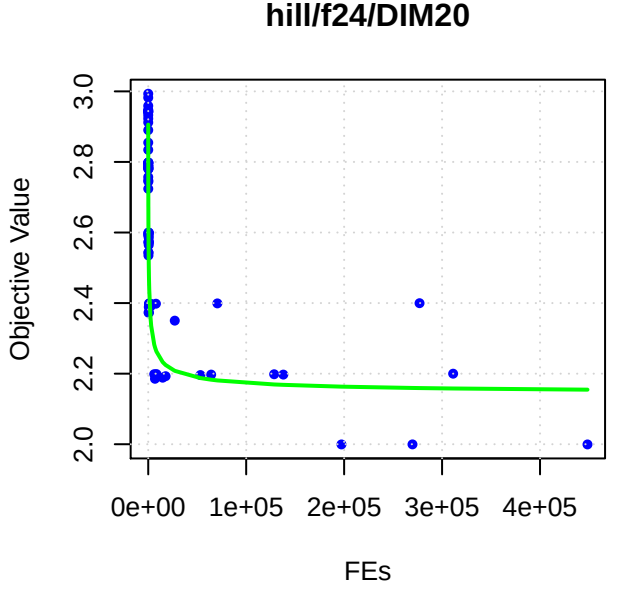
40000
60000
80000
FEs


hill/f24/DIM20
Objective Value
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2.6
2.8
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0e+00
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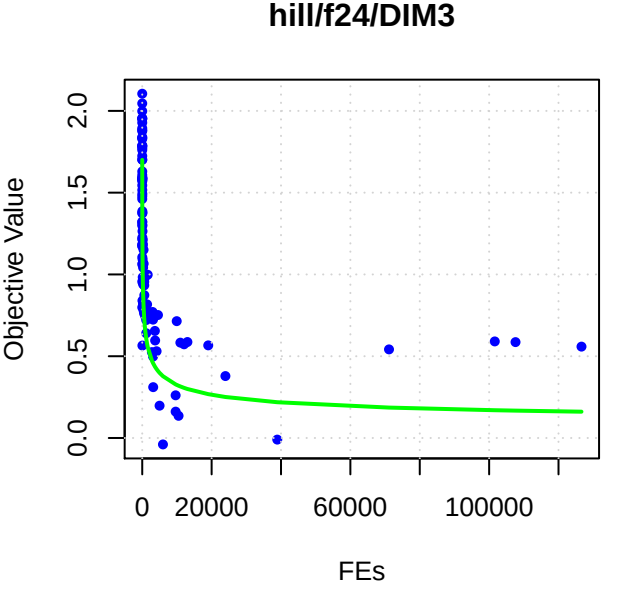
2e+05
3e+05
4e+05
FEs


hill/f24/DIM3
Objective Value
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1.5
2.0
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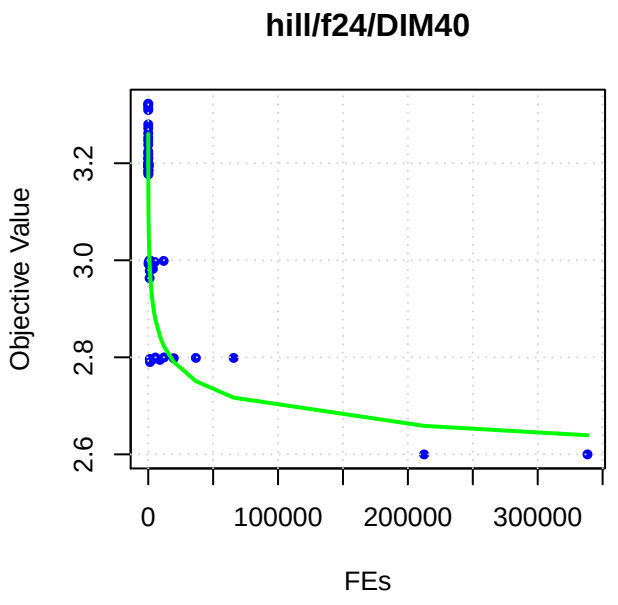
60000
100000
FEs


hill/f24/DIM40
Objective Value
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2.8
3.0
3.2
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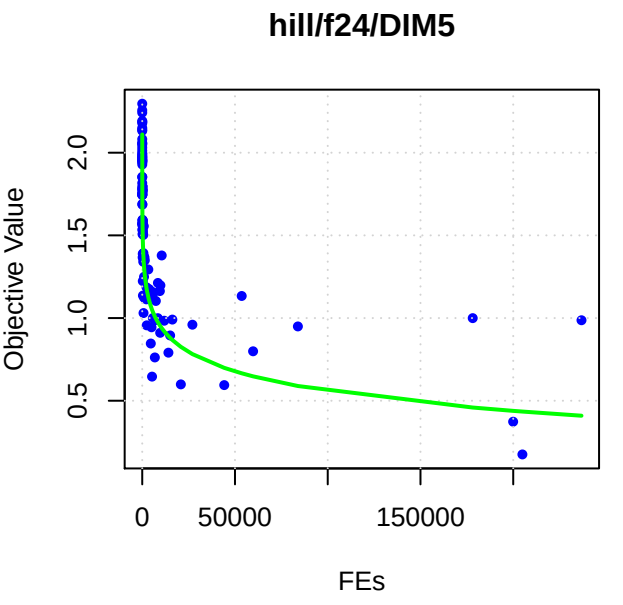
100000
200000
300000
FEs


hill/f24/DIM5
Objective Value
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1.0
1.5
2.0
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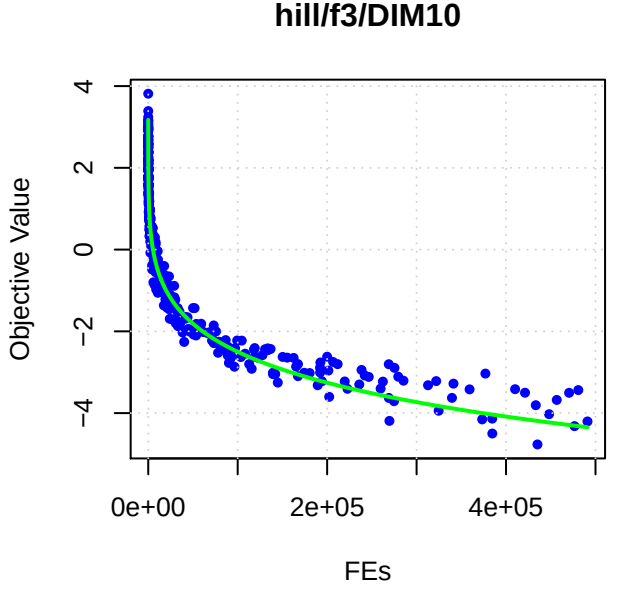
50000
150000
FEs


hill/f3/DIM10
Objective Value
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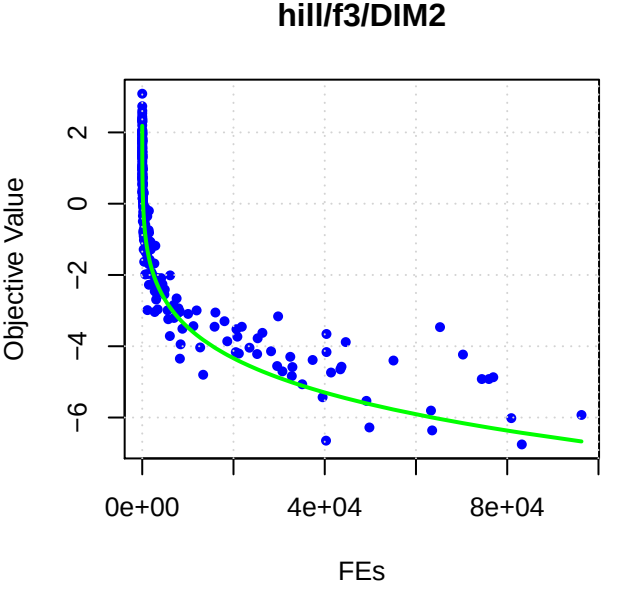
2e+05
4e+05
FEs


hill/f3/DIM2
Objective Value
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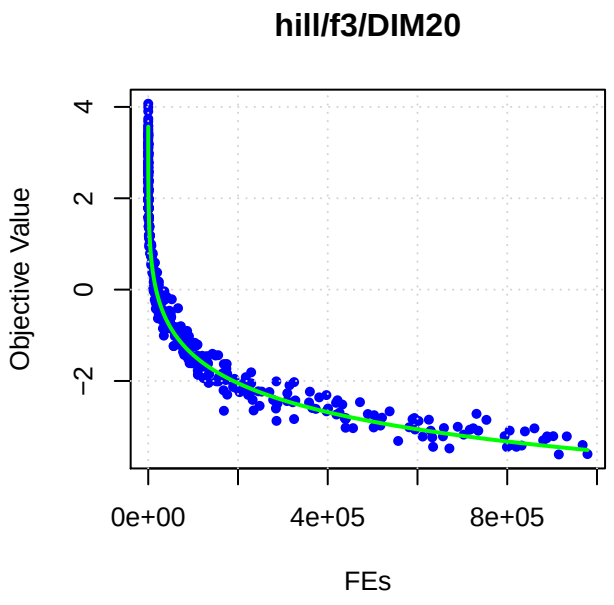
4e+04
8e+04
FEs


hill/f3/DIM20
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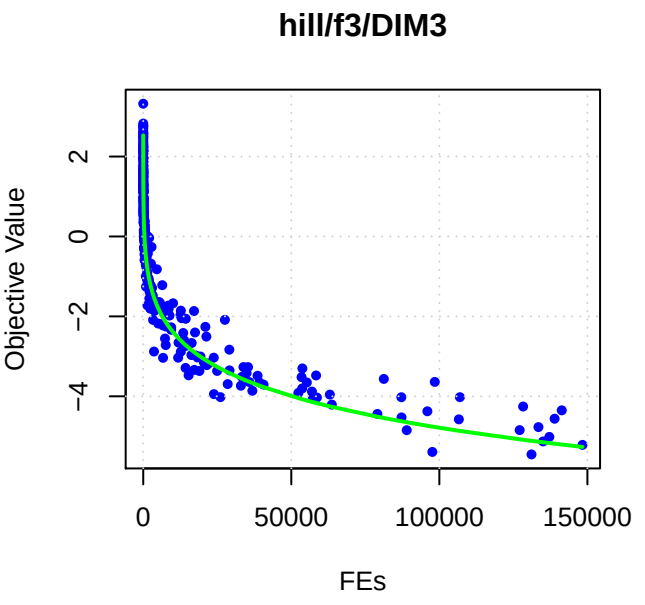
8e+05
FEs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Objective Value
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−2
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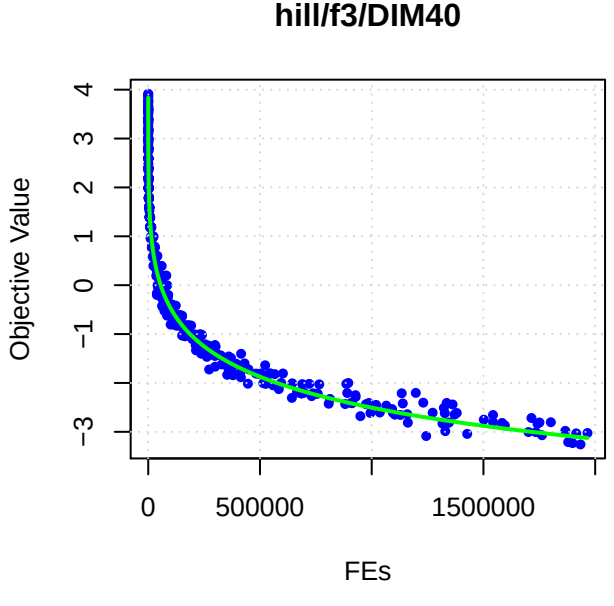
100000
150000
FEs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0
−1
−3
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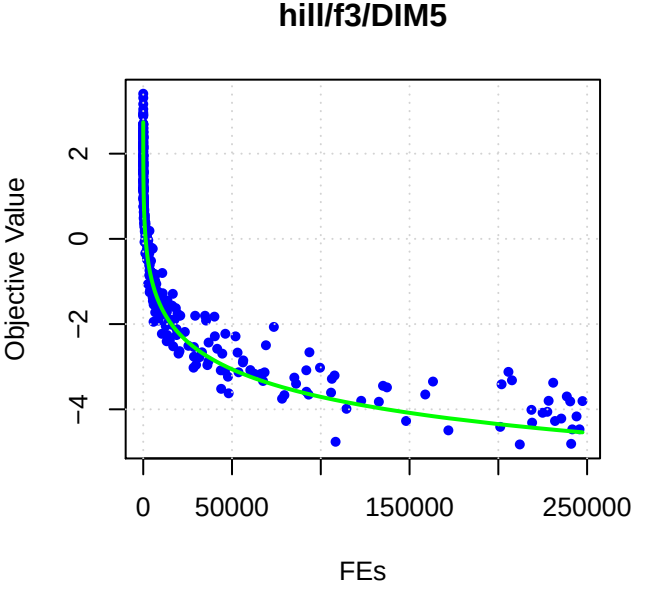
500000
1500000
FEs


hill/f3/DIM5
Objective Value
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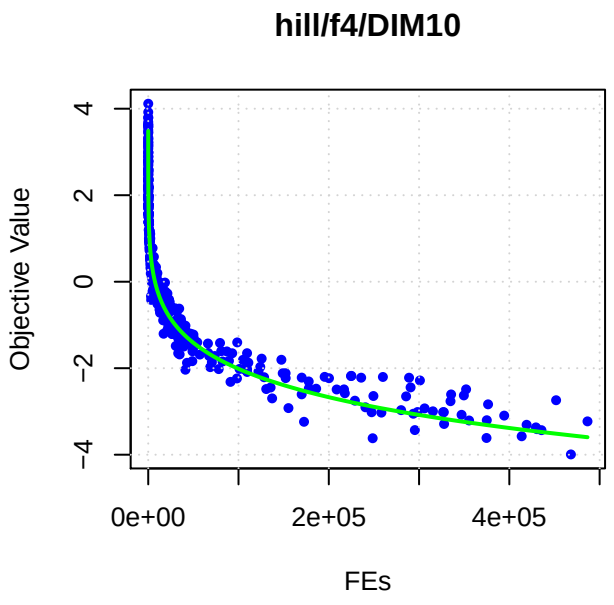
−4
0
50000
150000
250000
FEs


hill/f4/DIM10
Objective Value
FEs
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−2
−4
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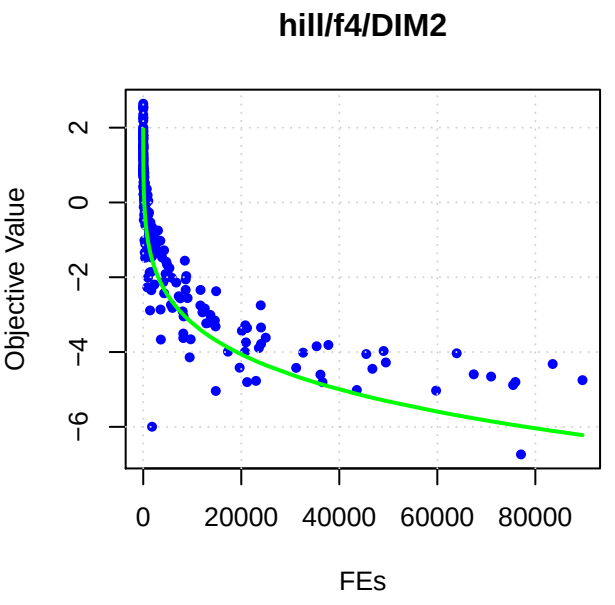
2e+05
4e+05


hill/f4/DIM2
Objective Value
FEs
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−4
−6
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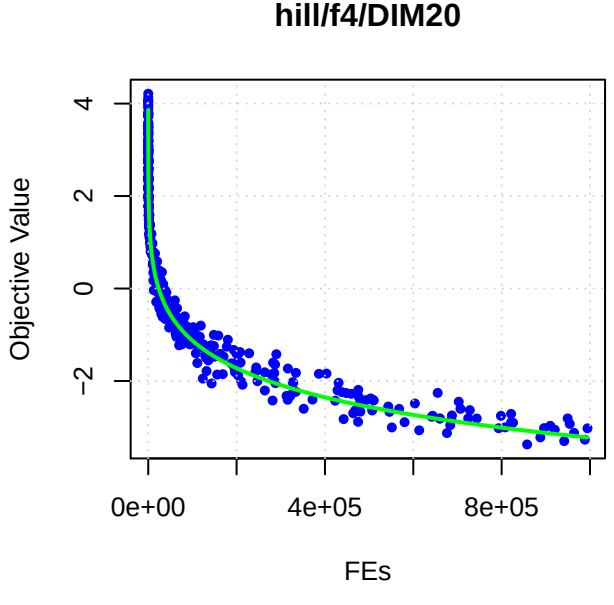
40000
60000
80000


hill/f4/DIM20
Objective Value
FEs
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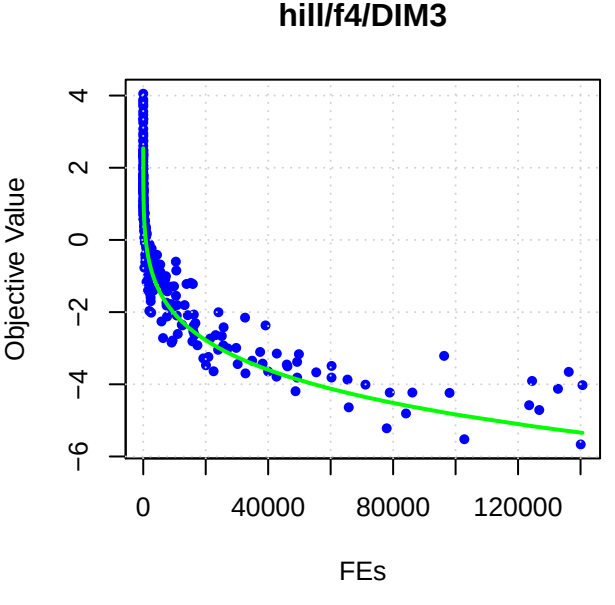
4e+05
8e+05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Objective Value
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−4
−6
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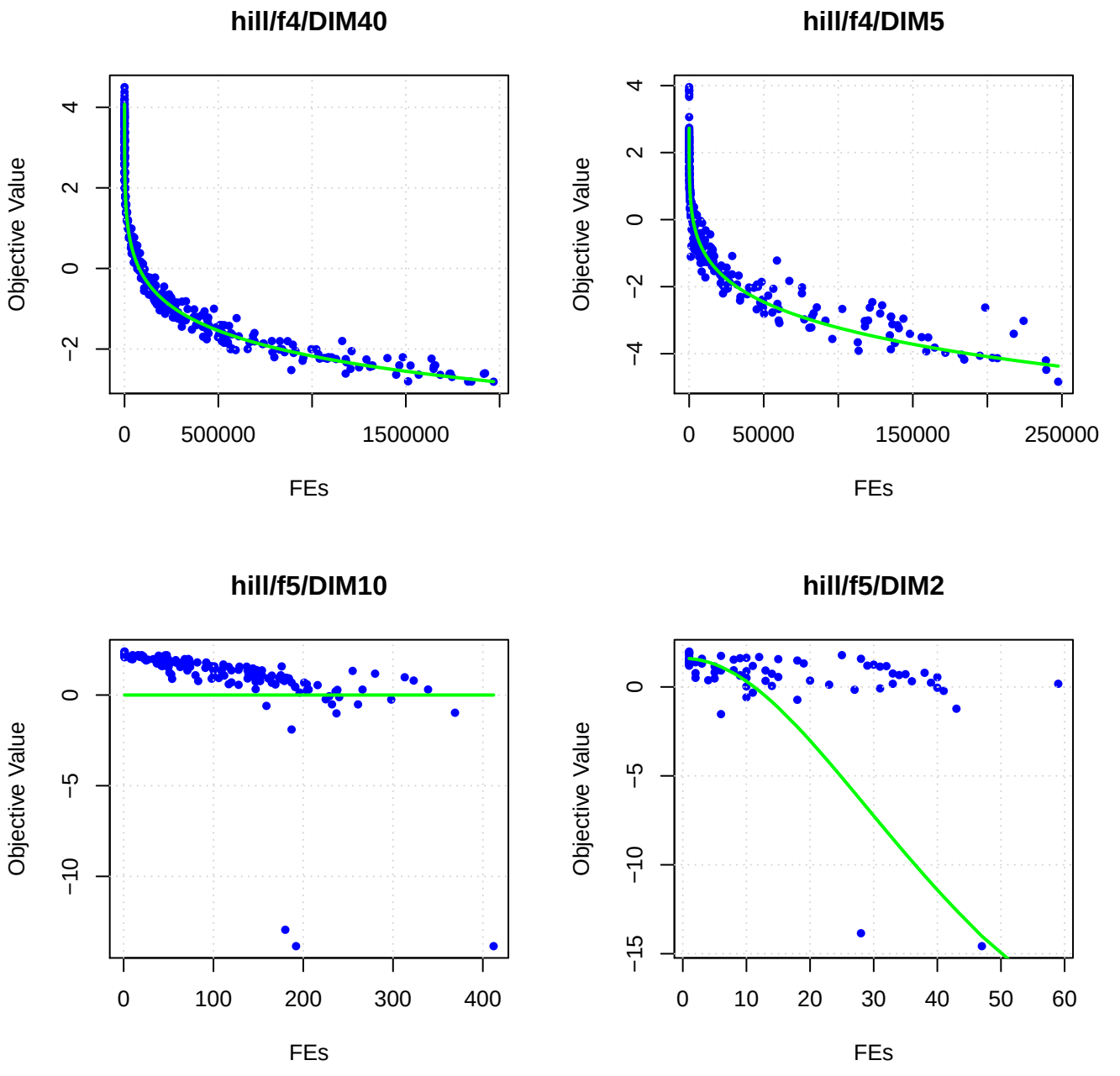
40000
80000
120000


hill/f4/DIM40
Objective Value
FEs
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500000
1500000
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2
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−2
hill/f4/DIM5
Objective Value
FEs
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50000
150000
250000
4
2
0
−2
−4
hill/f5/DIM10
Objective Value
FEs
0
100
200
300
400
0
−5
−10
hill/f5/DIM2
Objective Value
FEs
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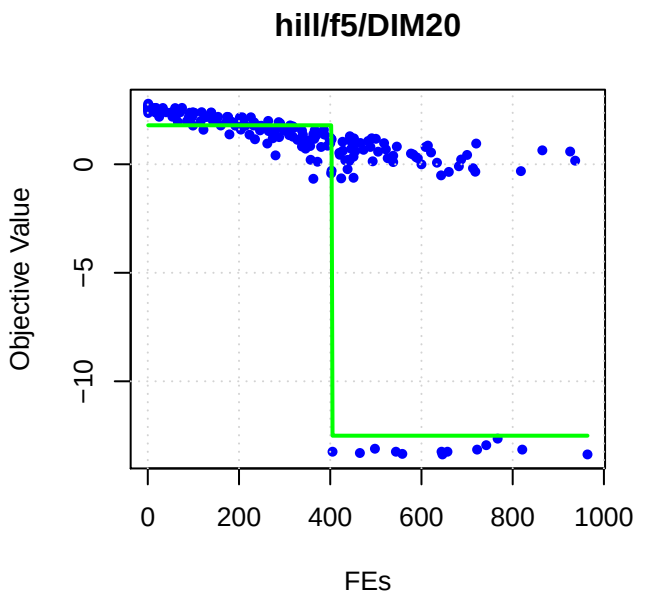
10
20
30
40
50
60
0
−5
−10
−15


hill/f5/DIM20
Objective Value
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−10
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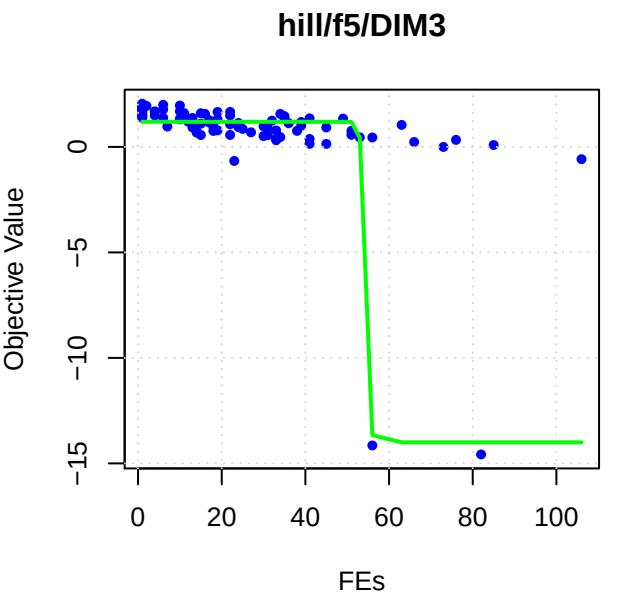
200
400
600
800
1000
FEs


hill/f5/DIM3
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20
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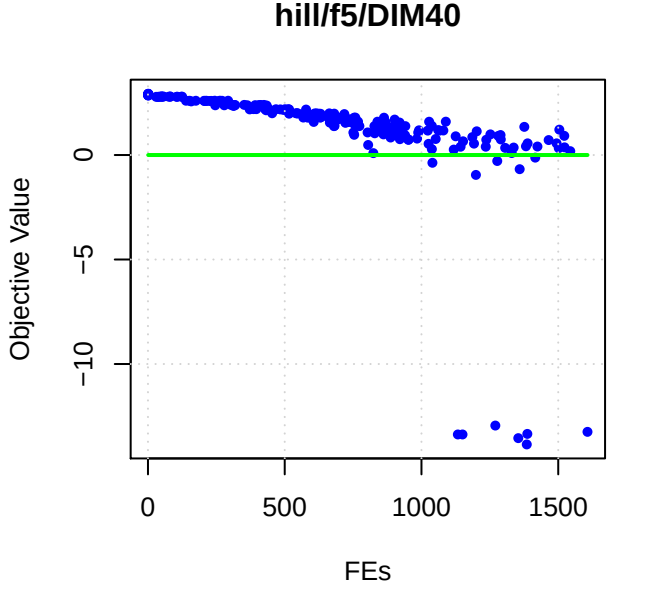
60
80
100
FEs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1000
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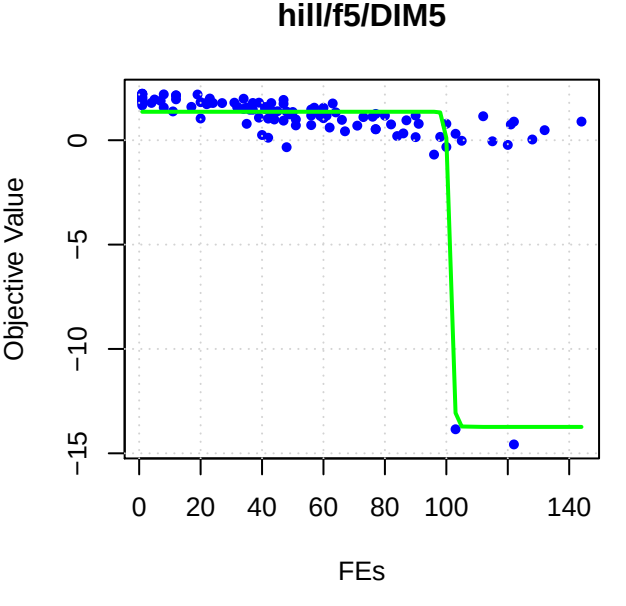
FEs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20
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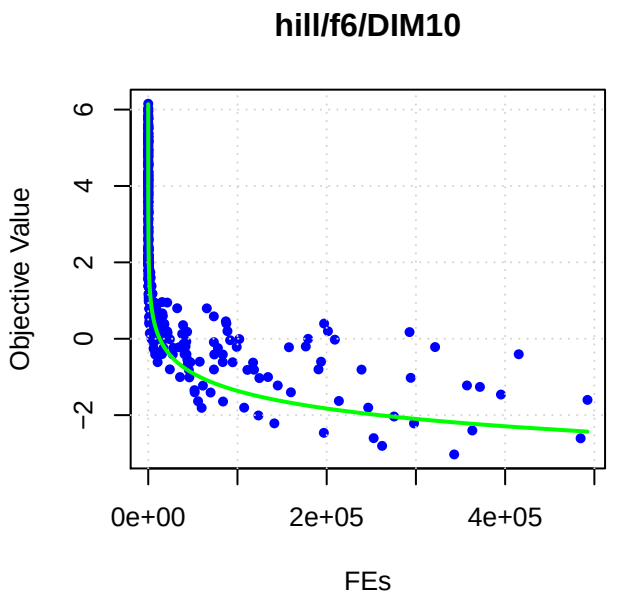
60
80
100
140
FEs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Objective Value
FEs
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4e+05
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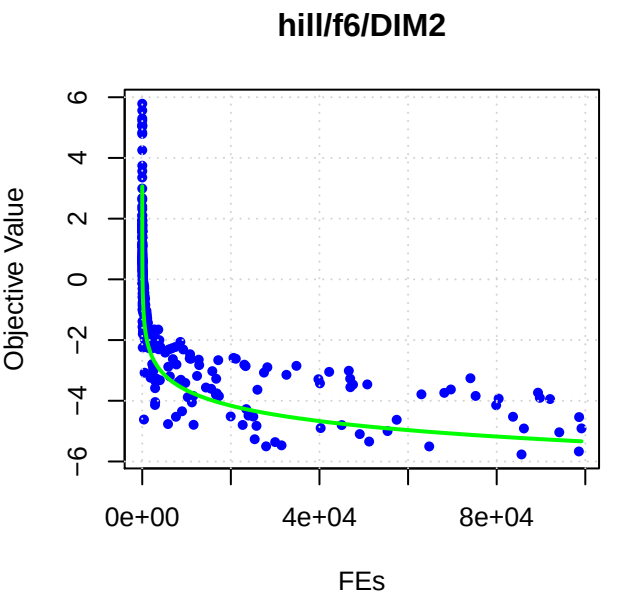
4
2
0
−2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8e+04
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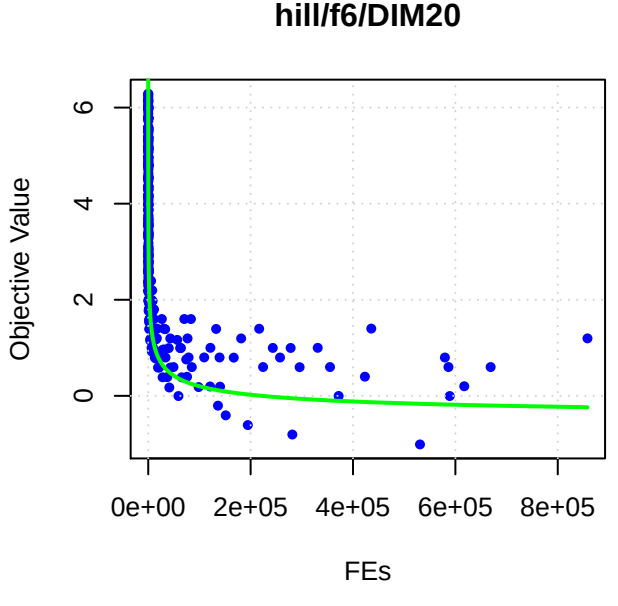
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FEs
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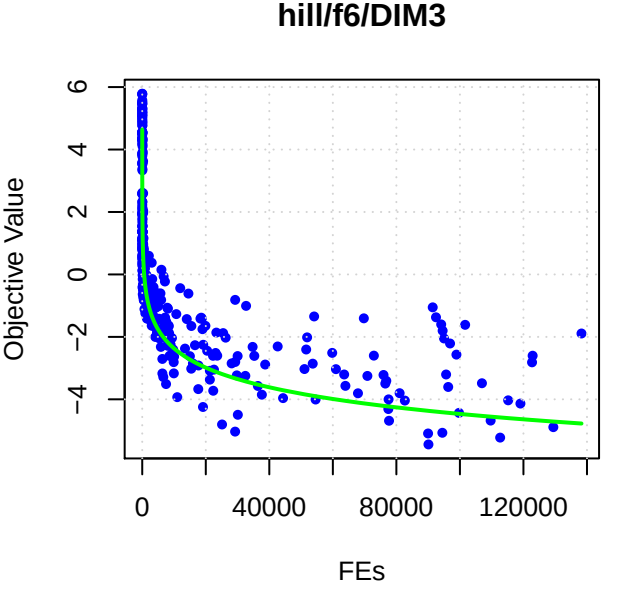
8e+05
6
4
2
0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Objective Value
FEs
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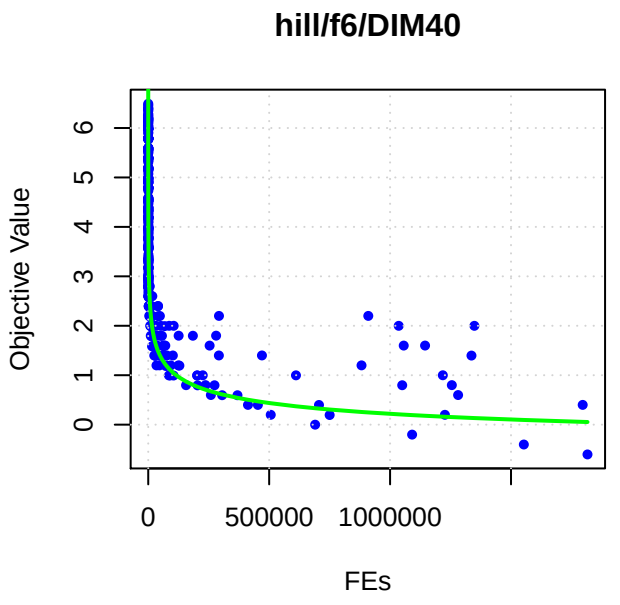
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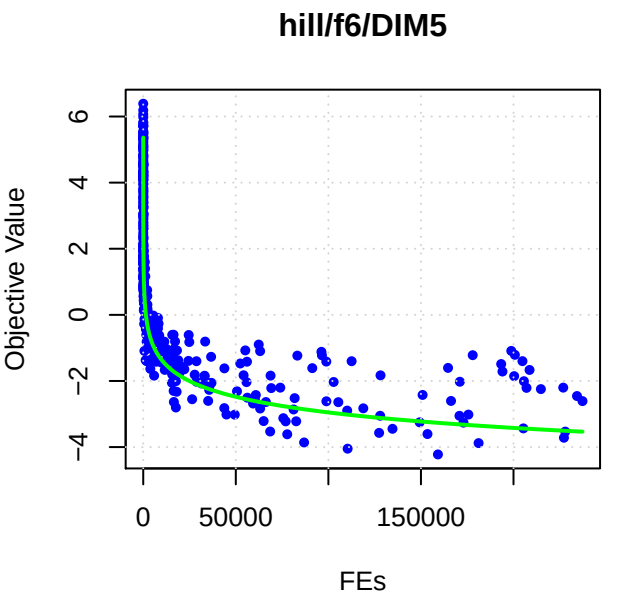
FEs


hill/f6/DIM5
Objective Value
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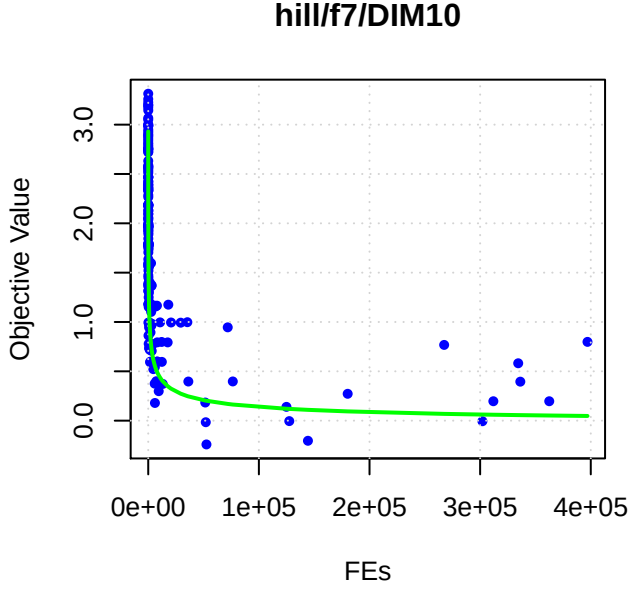
FEs


hill/f7/DIM10
Objective Value
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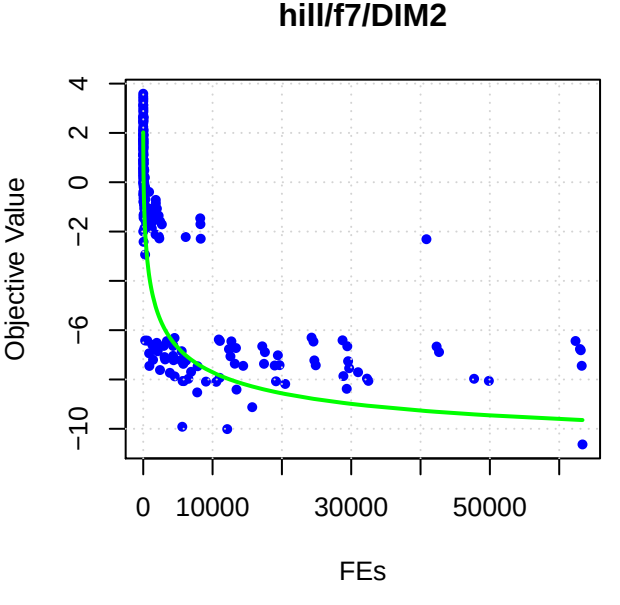
2e+05
3e+05
4e+05
FEs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Objective Value
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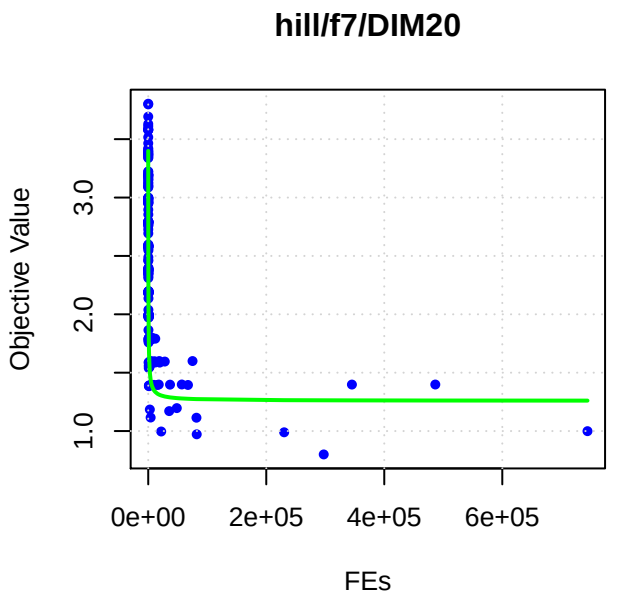
50000
FEs


hill/f7/DIM20
Objective Value
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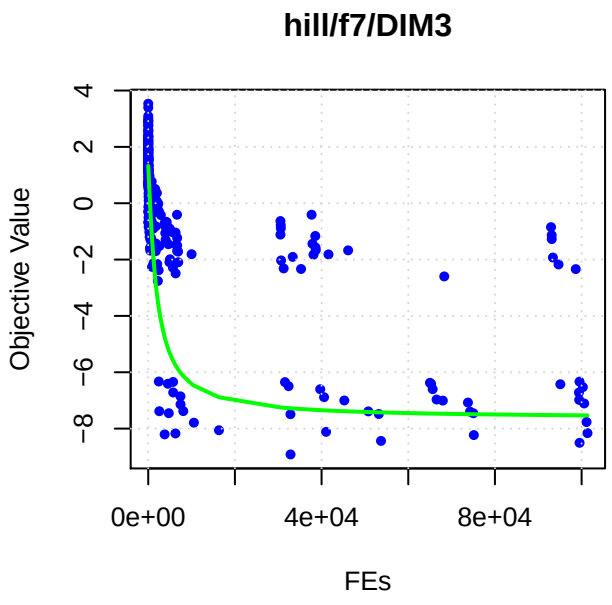
6e+05
FEs


hill/f7/DIM3
Objective Value
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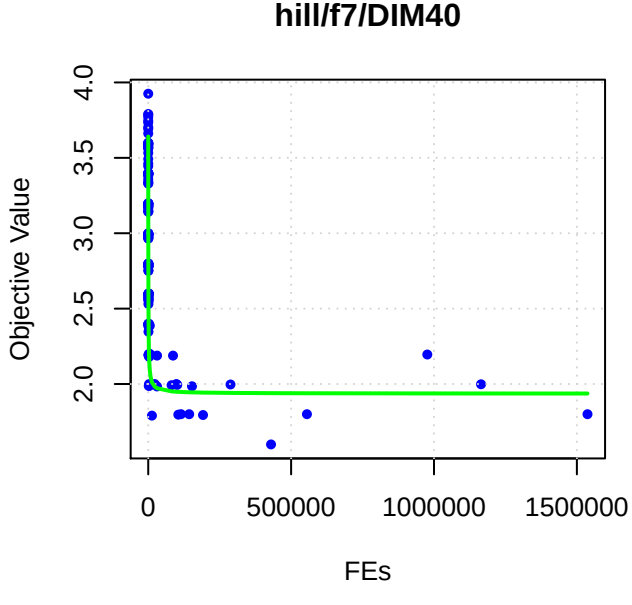
4e+04
8e+04
FEs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Objective Value
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3.5
4.0
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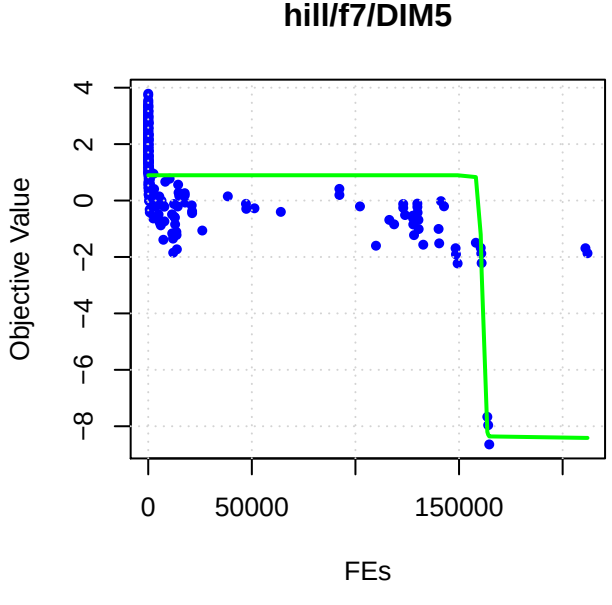
500000
1000000
1500000
FEs


hill/f7/DIM5
Objective Value
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2
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−2
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−6
−8
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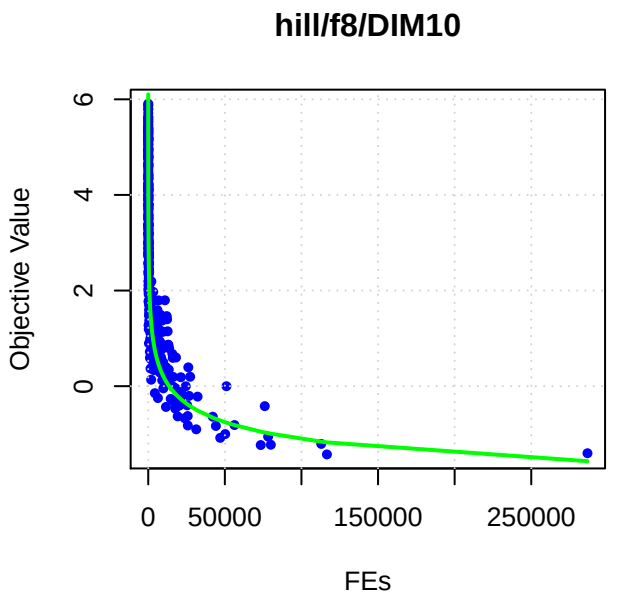
50000
150000
FEs


hill/f8/DIM10
Objective Value
FEs
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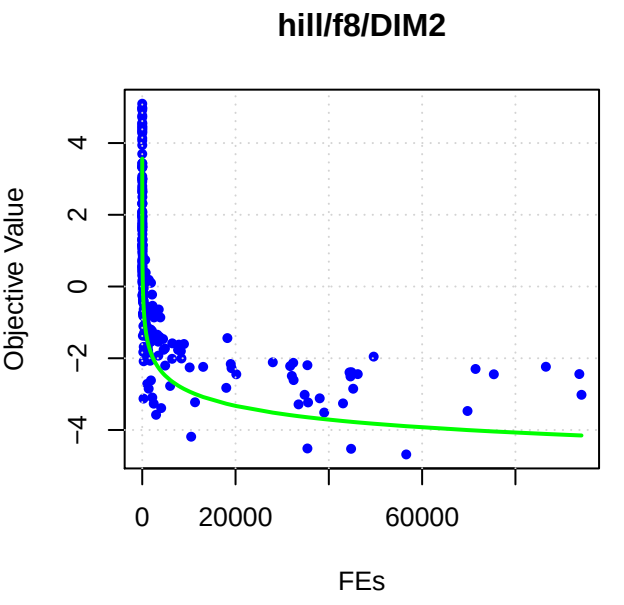
2
4
6
0
50000
150000
250000


hill/f8/DIM2
Objective Value
FEs
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2
4
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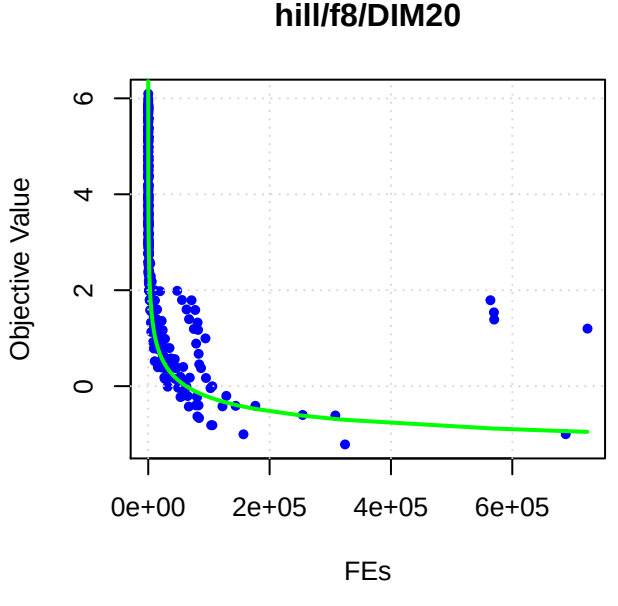
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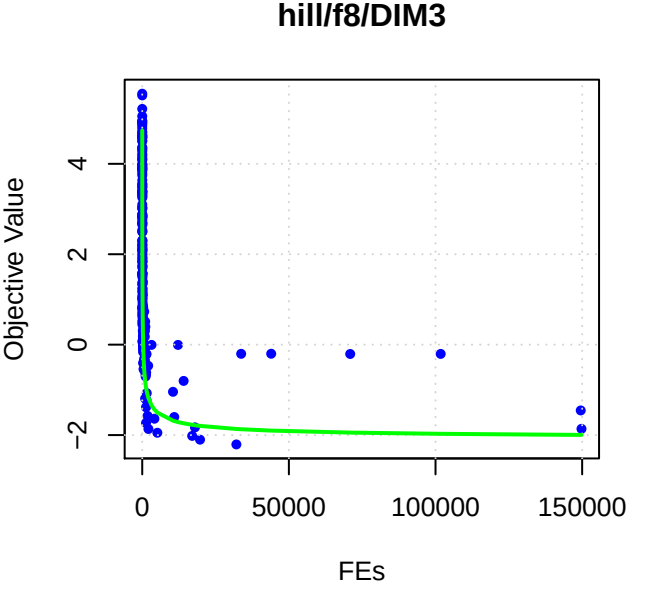
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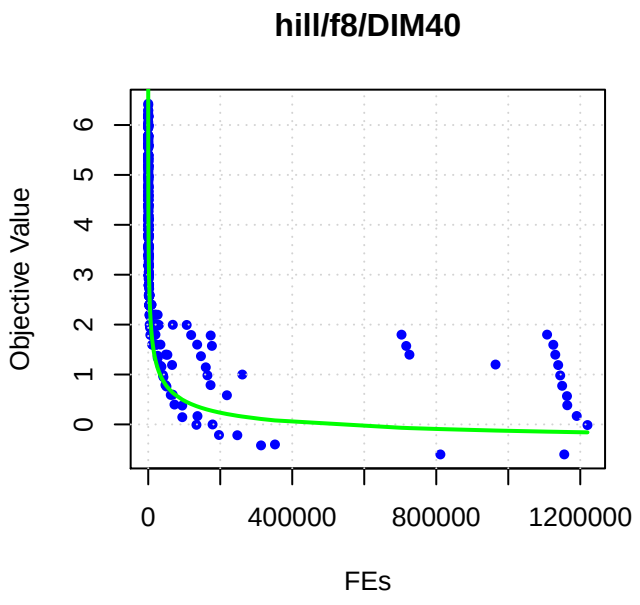
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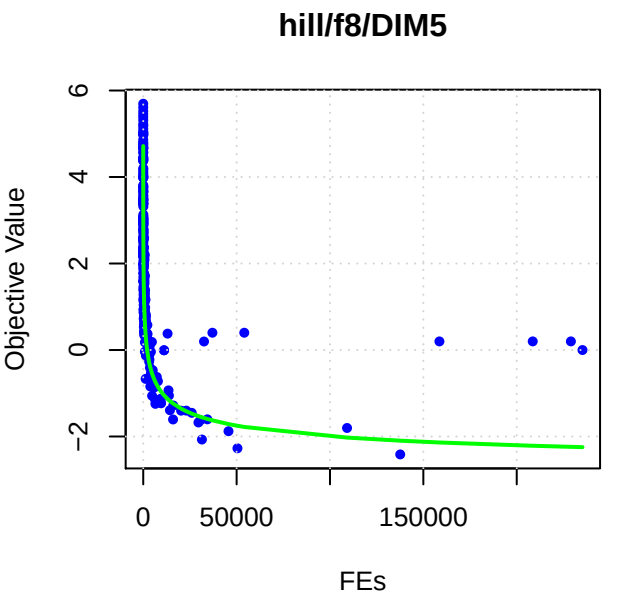
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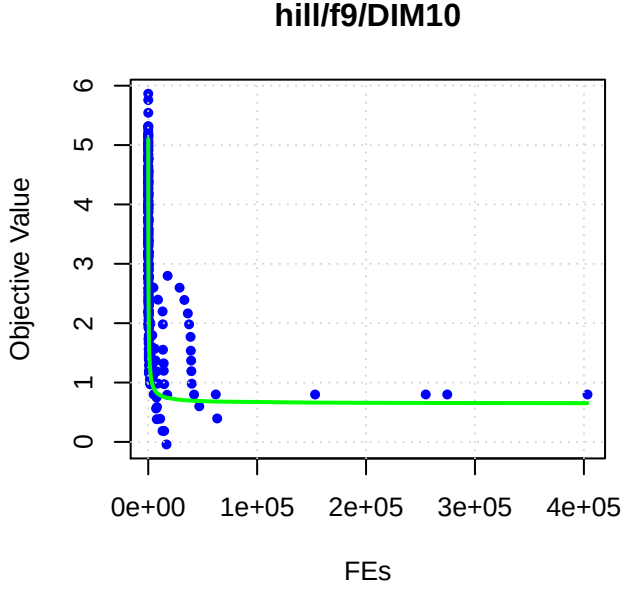
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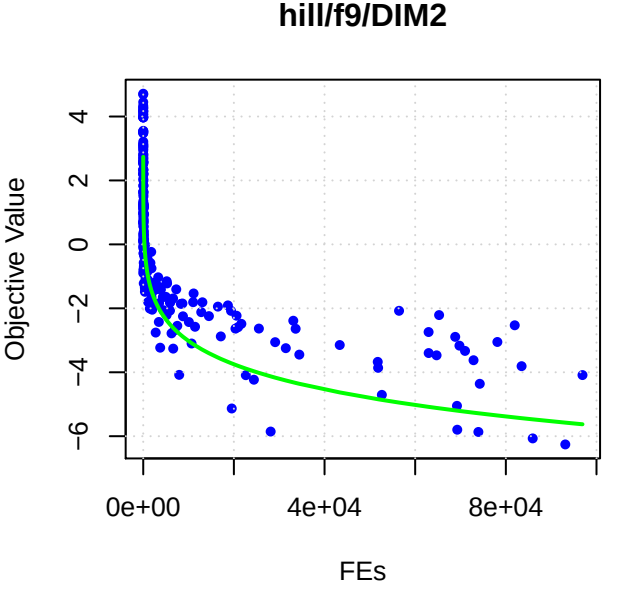
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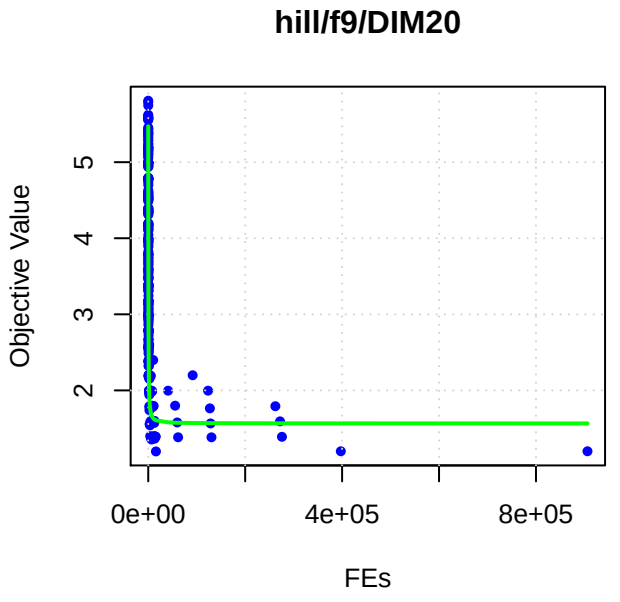
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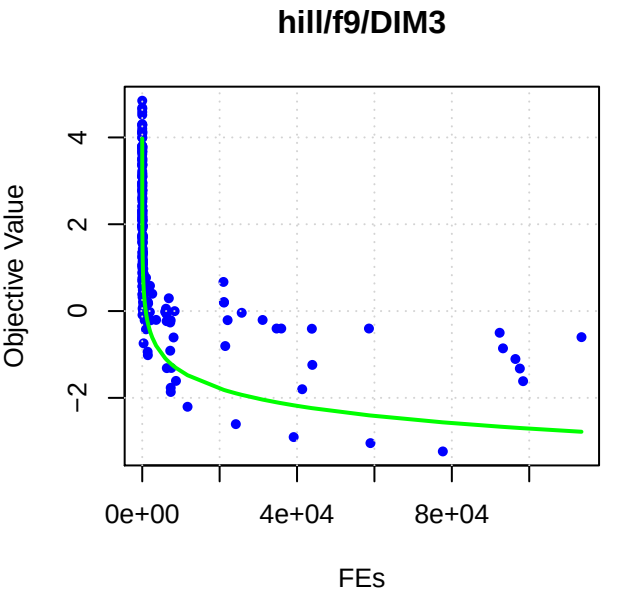
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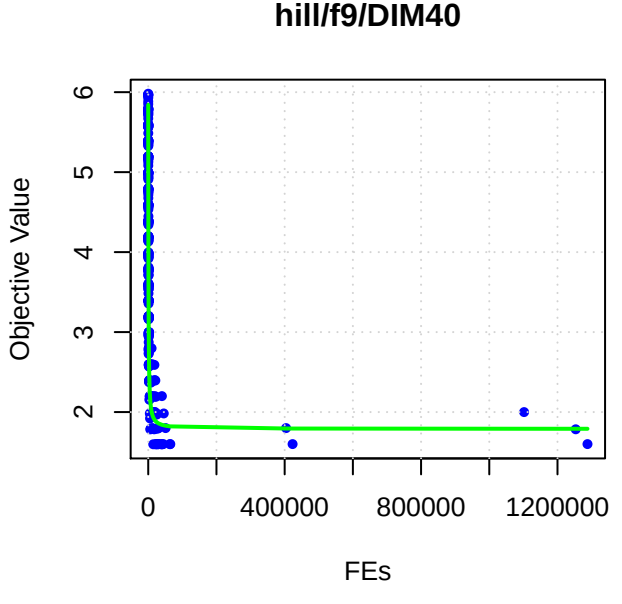
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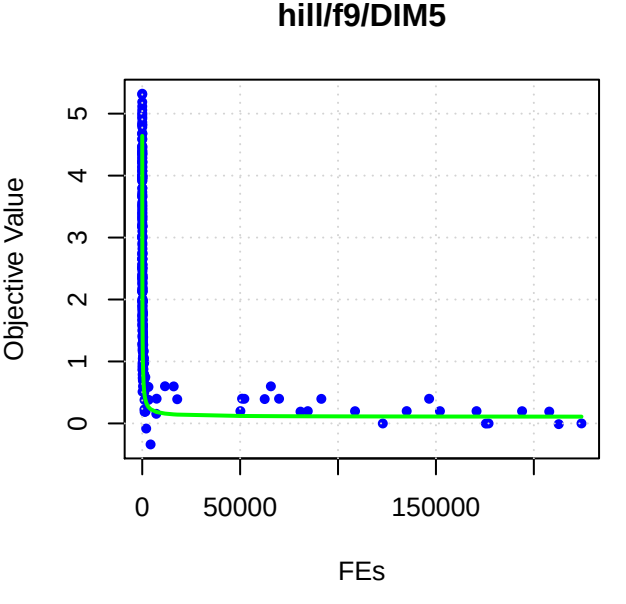
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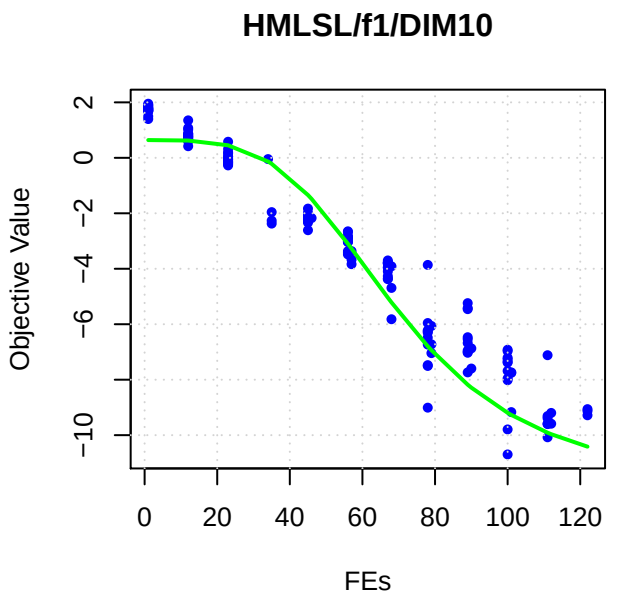
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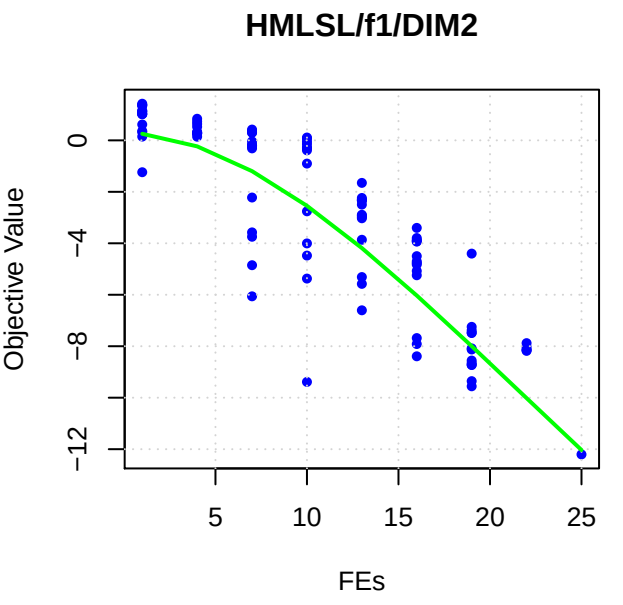
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Objective Value
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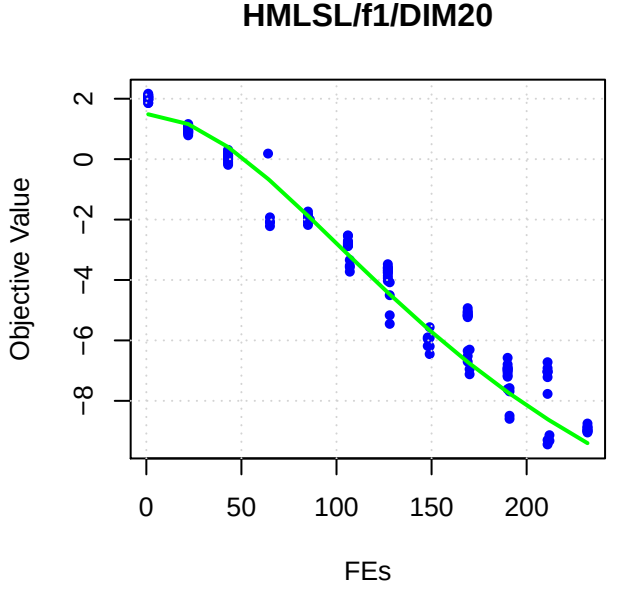
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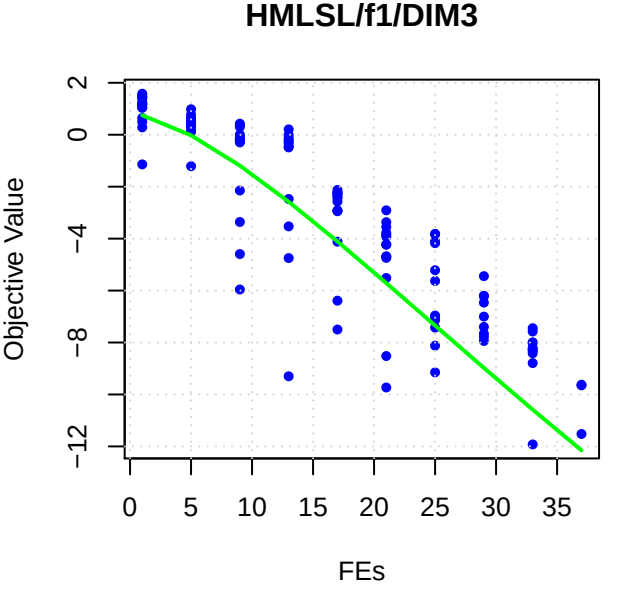
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Objective Value
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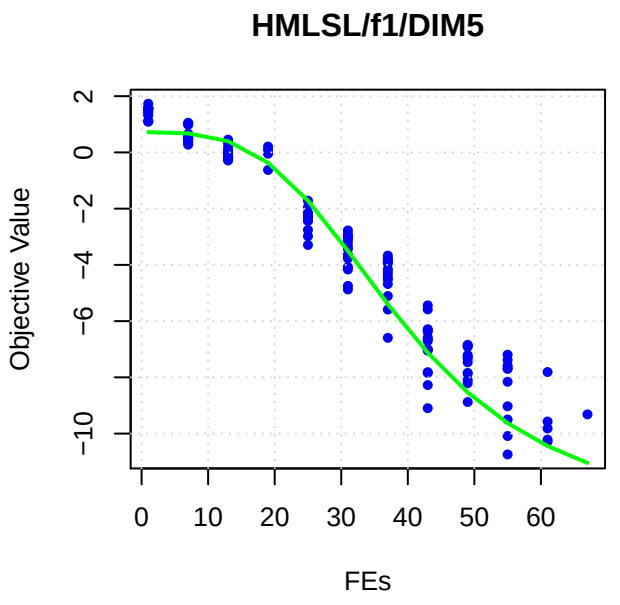
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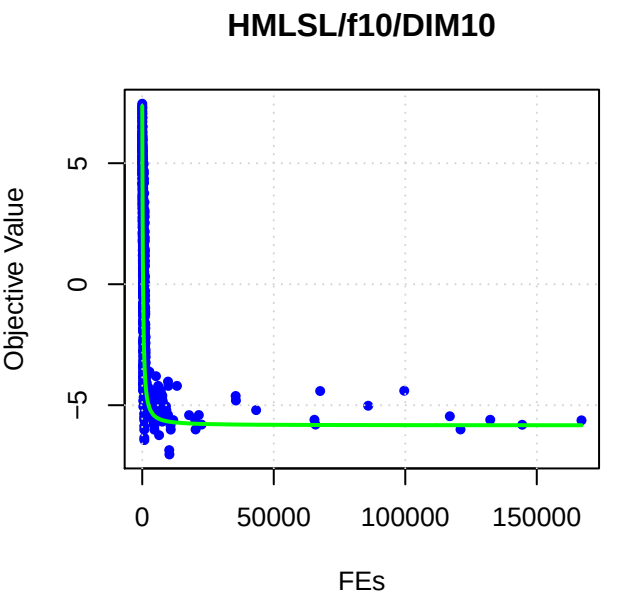
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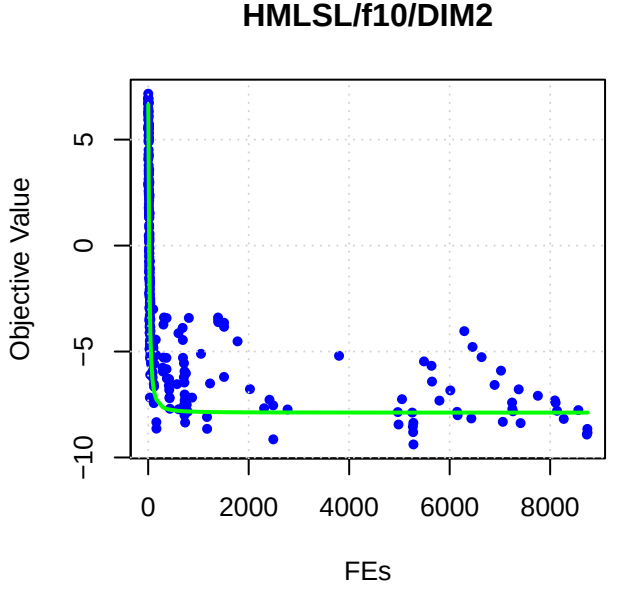
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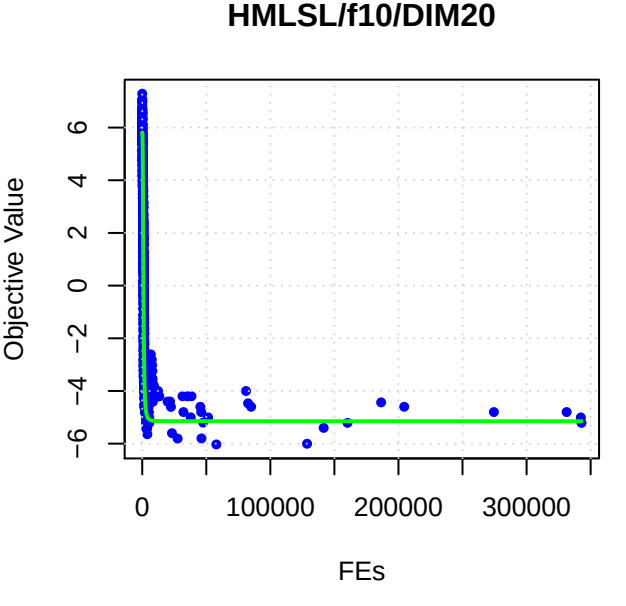
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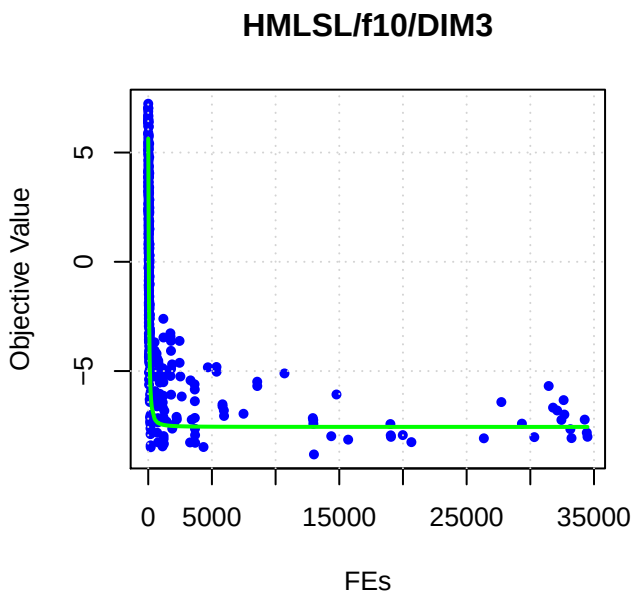
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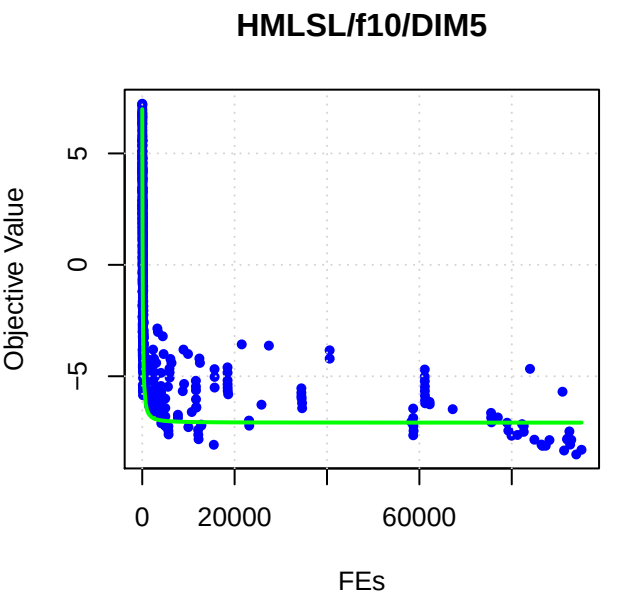
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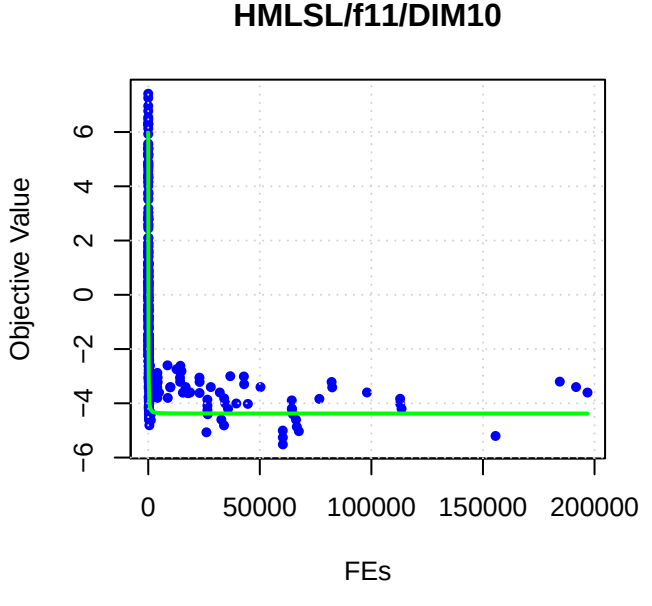
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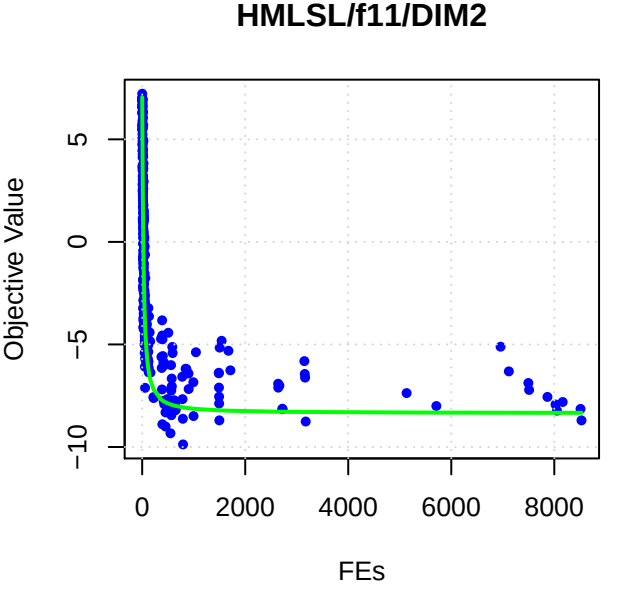
FEs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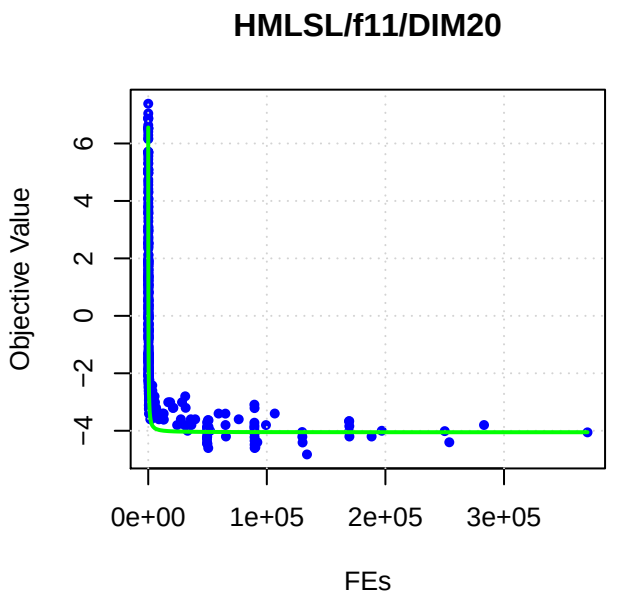
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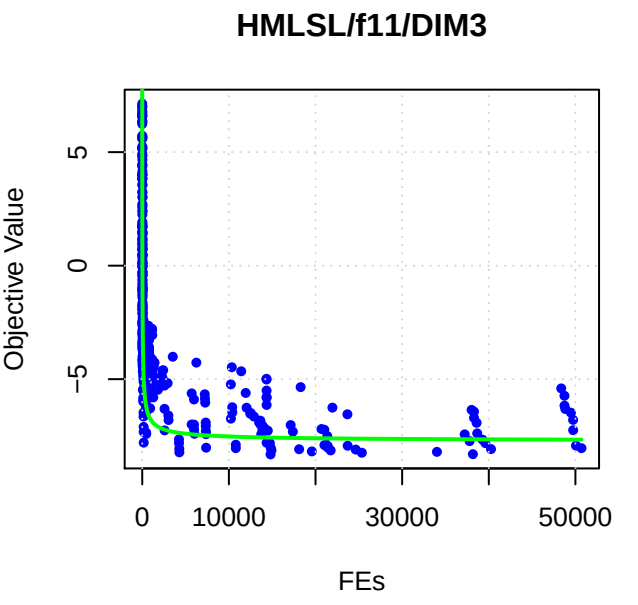
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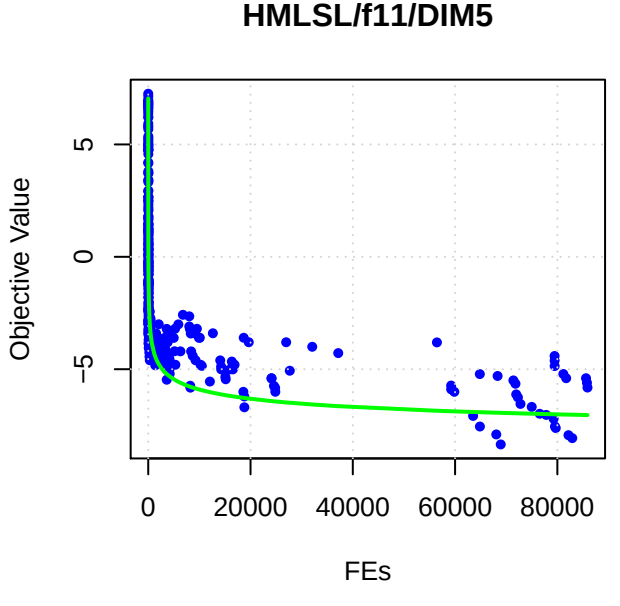
FEs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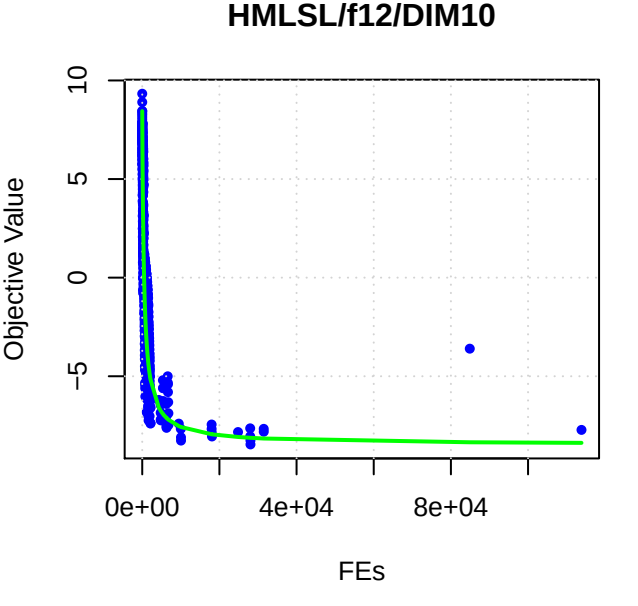
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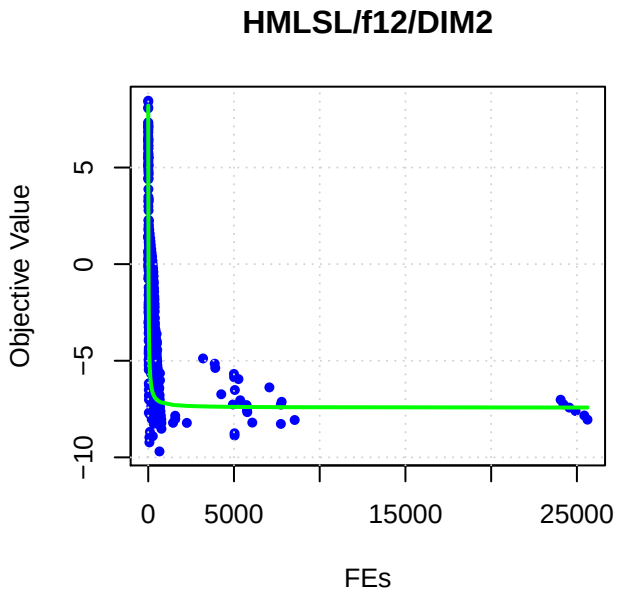
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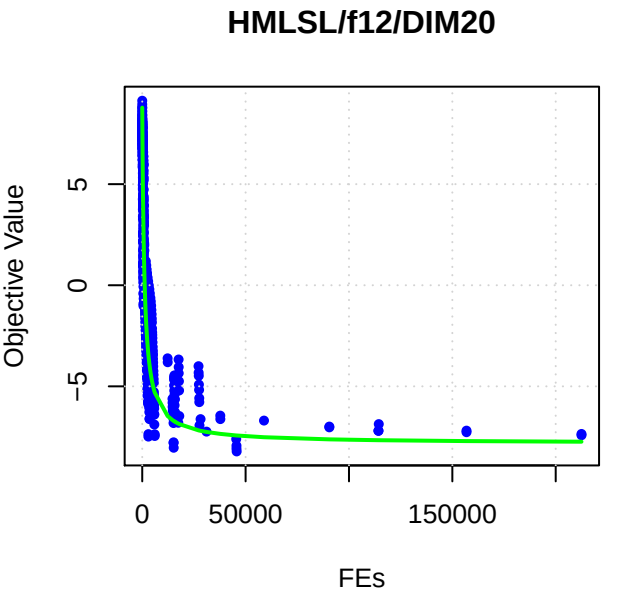
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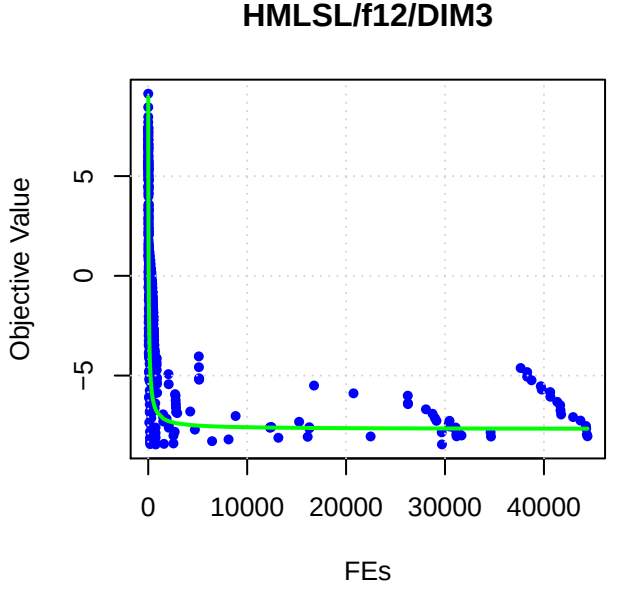
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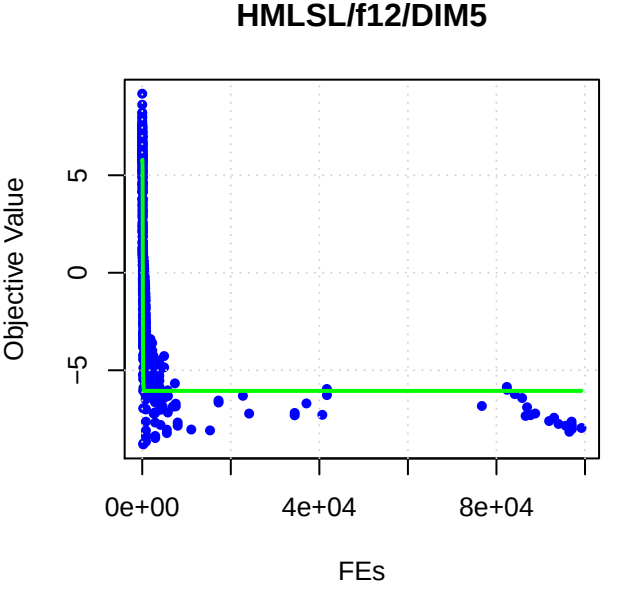
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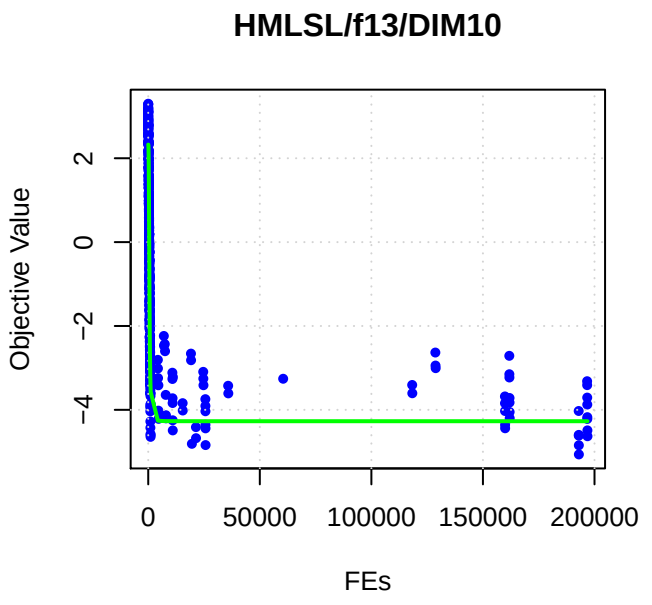
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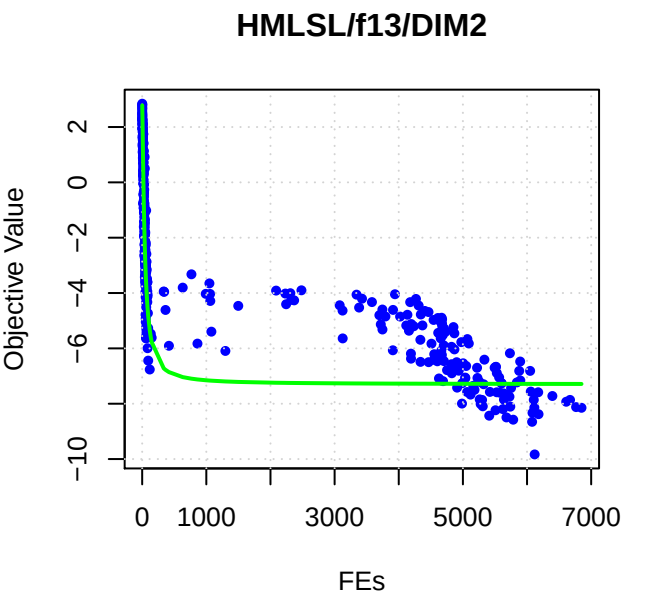
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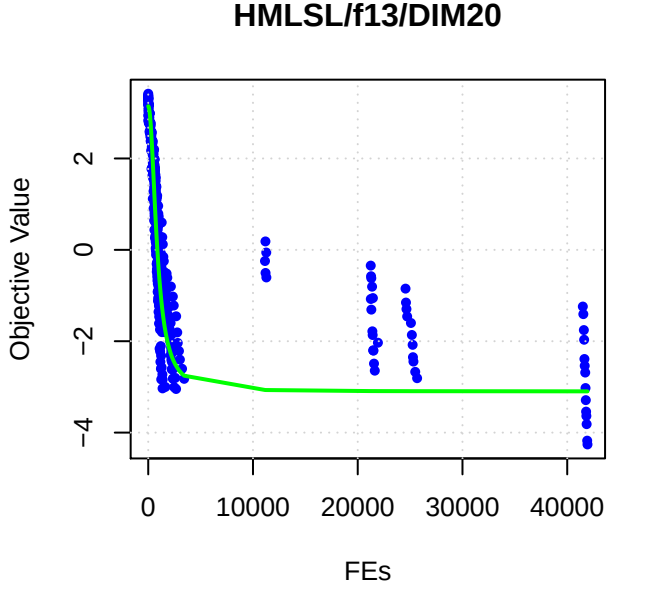
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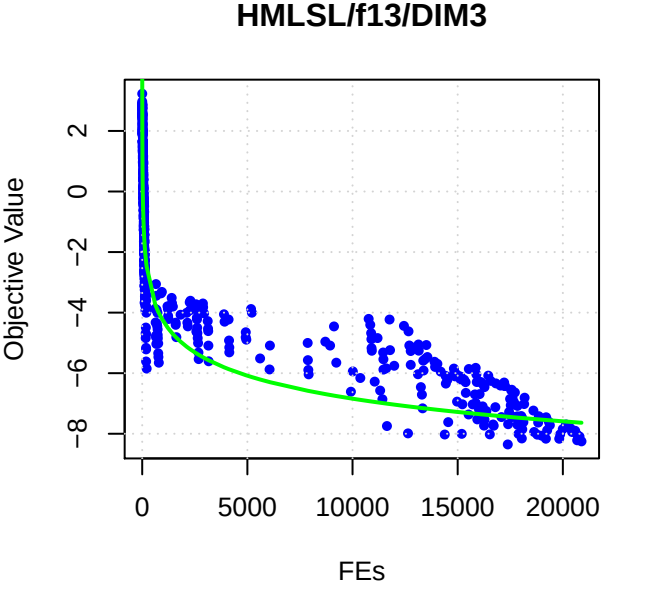
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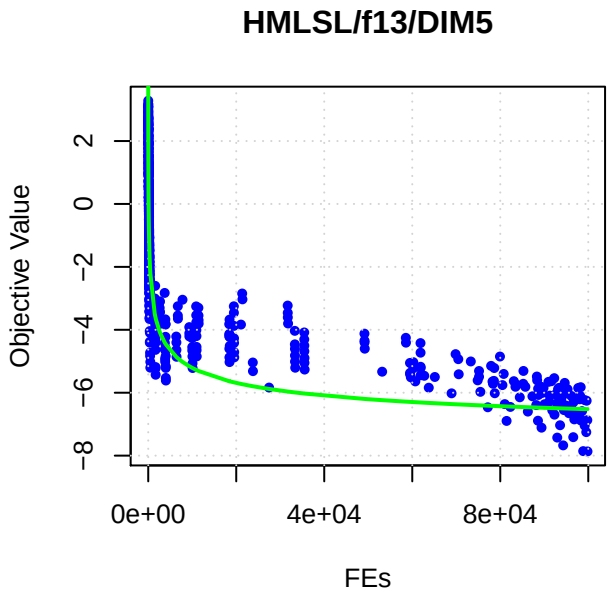
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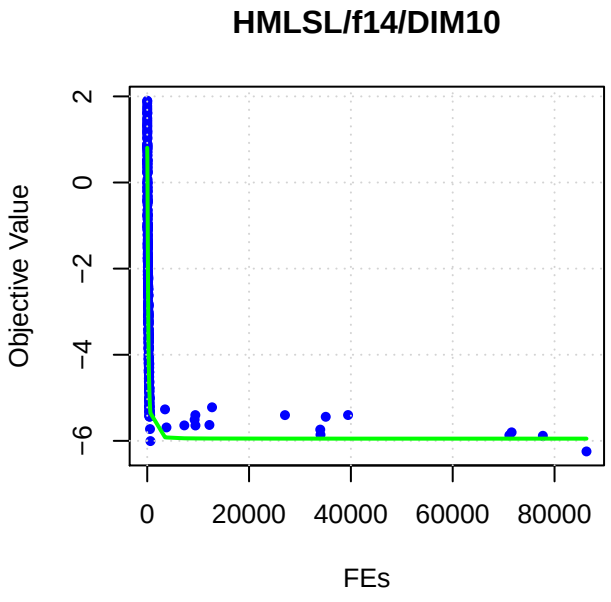
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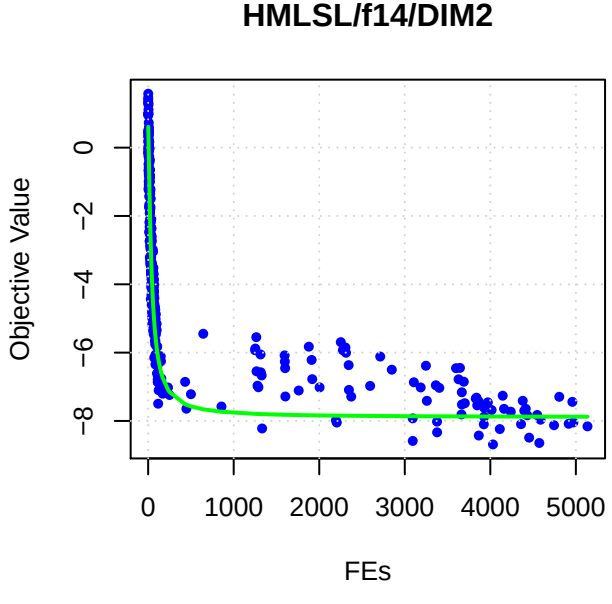
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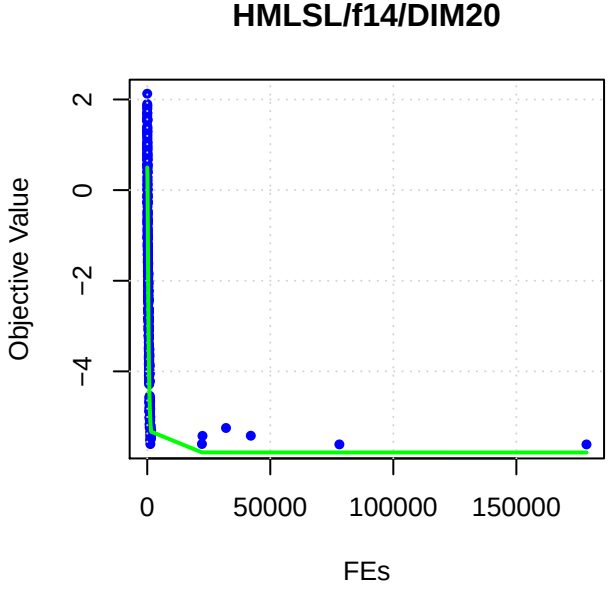
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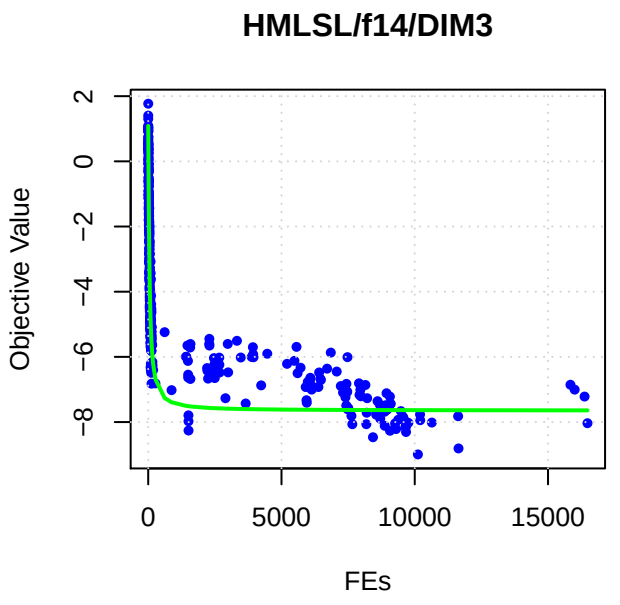
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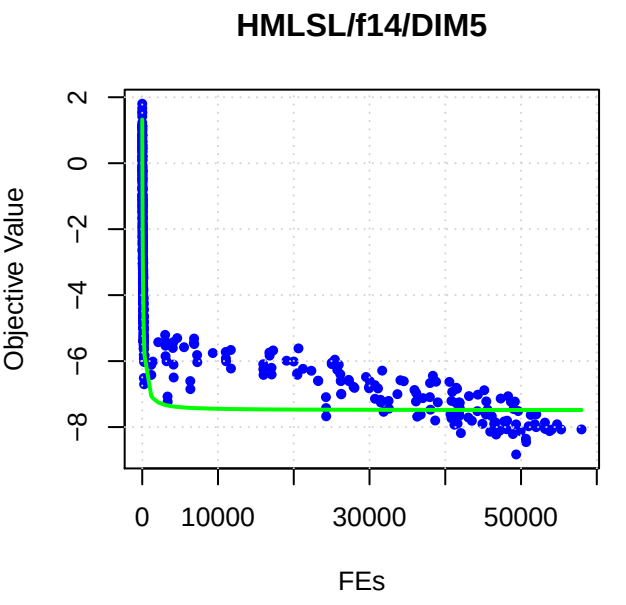
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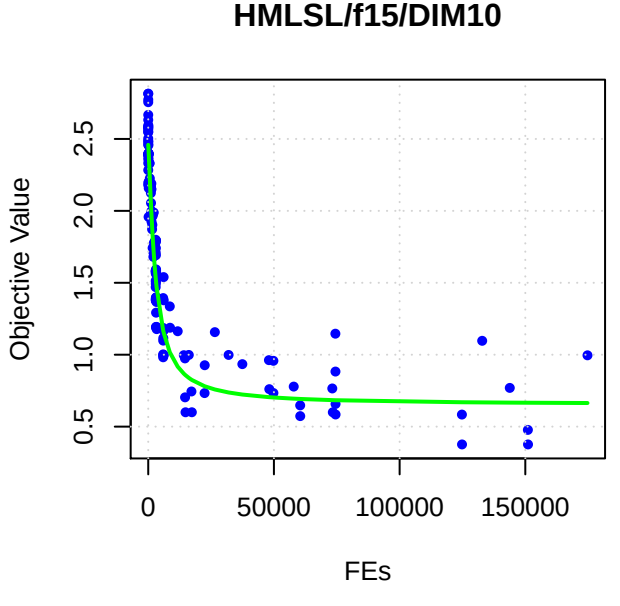
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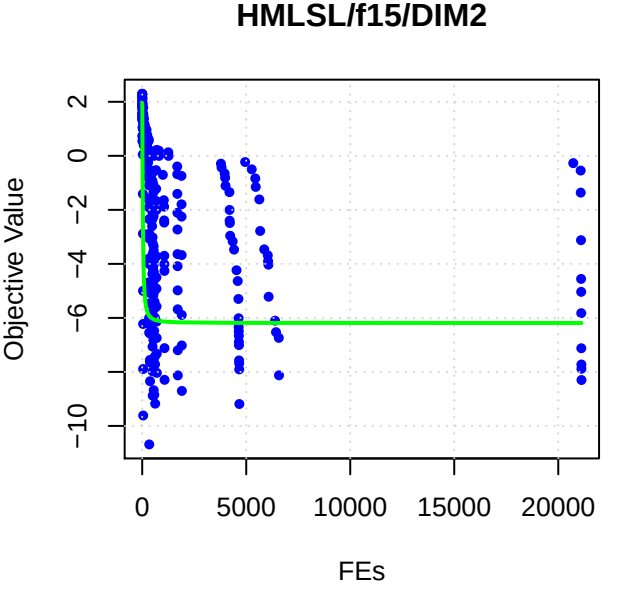
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10000
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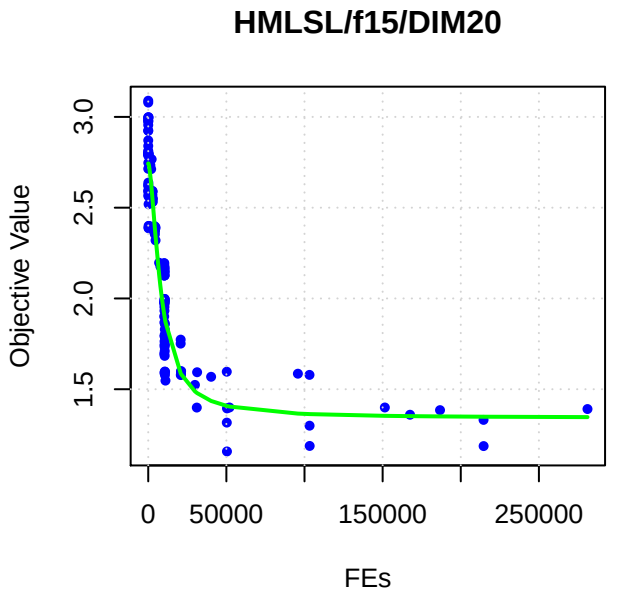
20000


HMLSL/f15/DIM20
Objective Value
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2.0
1.5
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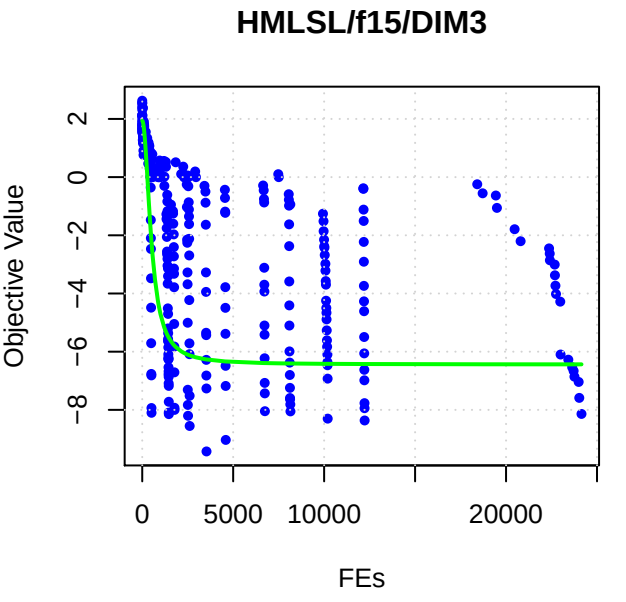
150000
250000
FEs


HMLSL/f15/DIM3
Objective Value
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−4
−6
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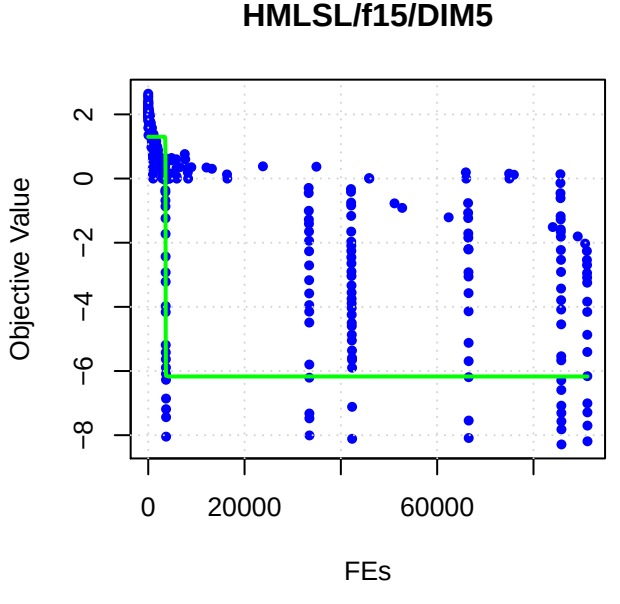
10000
20000
FEs


HMLSL/f15/DIM5
Objective Value
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−2
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−6
−8
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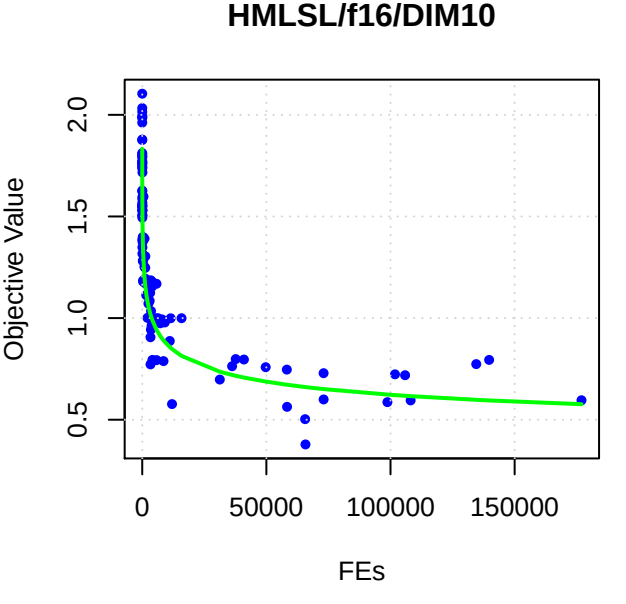
20000
60000
FEs


HMLSL/f16/DIM10
Objective Value
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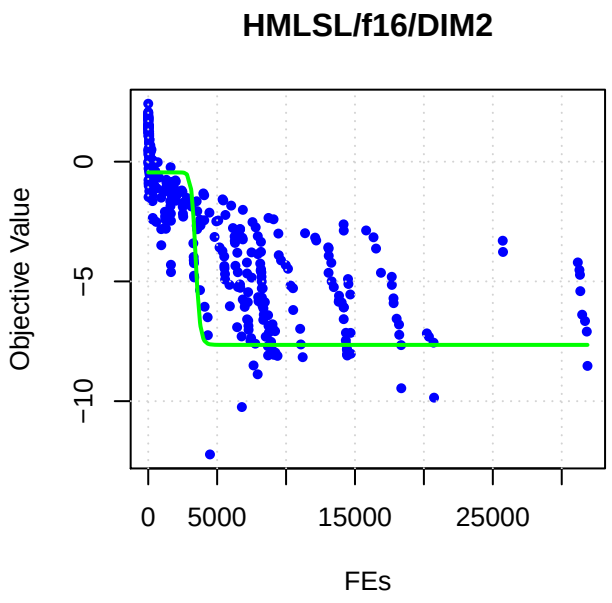
1.5
1.0
0.5
0
50000
100000
150000
FEs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−10
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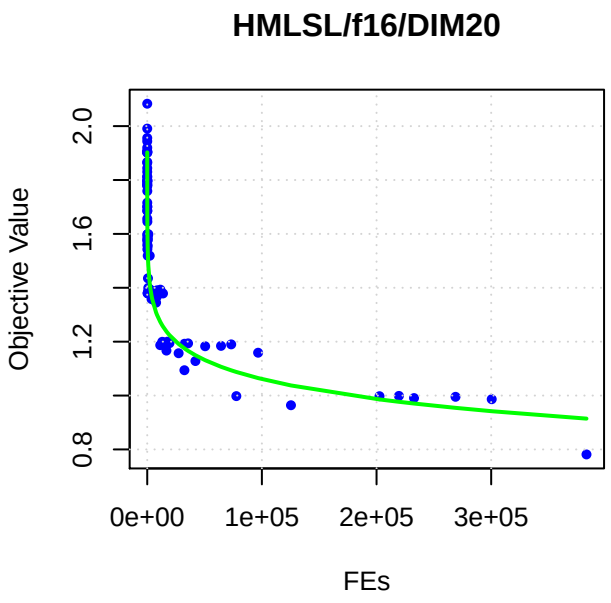
15000
25000
FEs


HMLSL/f16/DIM20
Objective Value
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1.6
1.2
0.8
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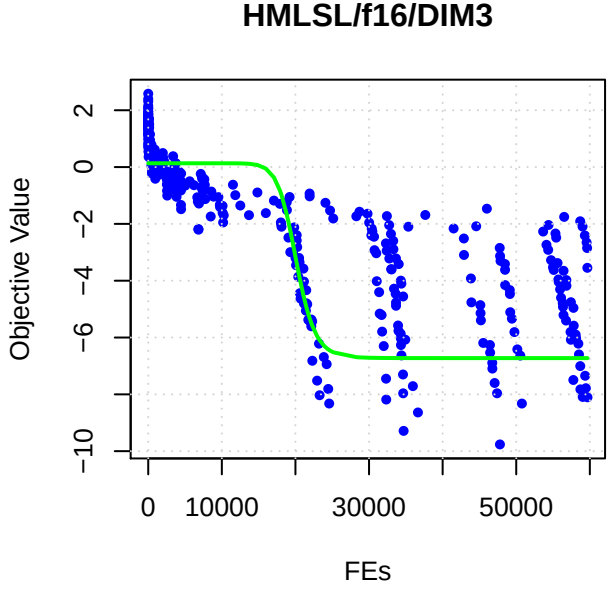
1e+05
2e+05
3e+05
FEs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Objective Value
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−4
−6
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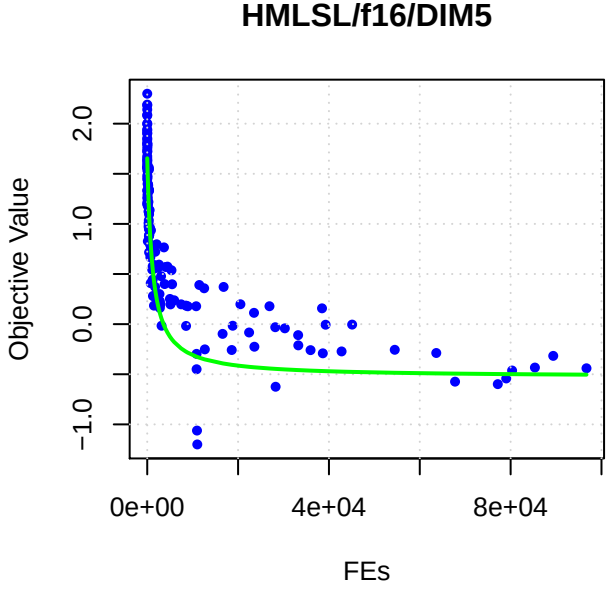
10000
30000
50000
FEs


HMLSL/f16/DIM5
Objective Value
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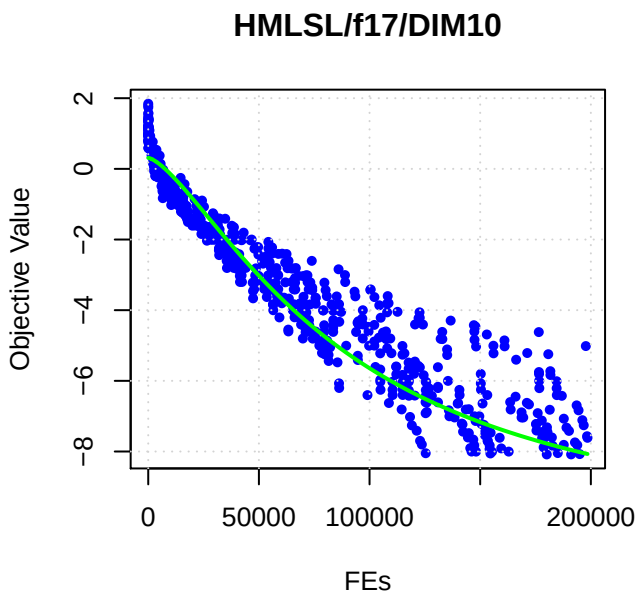
1.0
0.0
−1.0
0e+00
4e+04
8e+04
FEs


HMLSL/f17/DIM10
Objective Value
FEs
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−4
−6
−8
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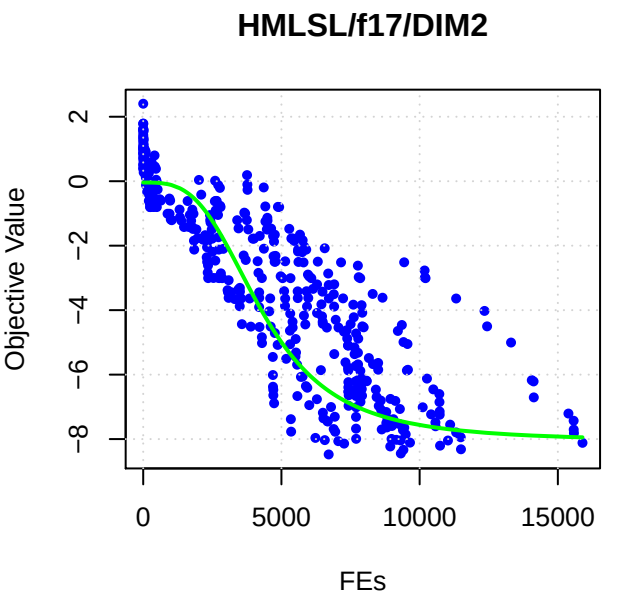
100000
200000


HMLSL/f17/DIM2
Objective Value
FEs
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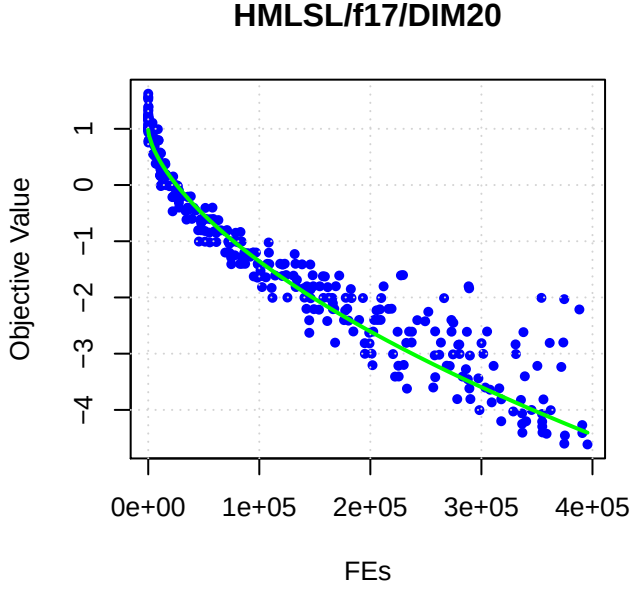
−4
−6
−8
0
5000
10000
15000


HMLSL/f17/DIM20
Objective Value
FEs
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−2
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−4
0e+00
1e+05
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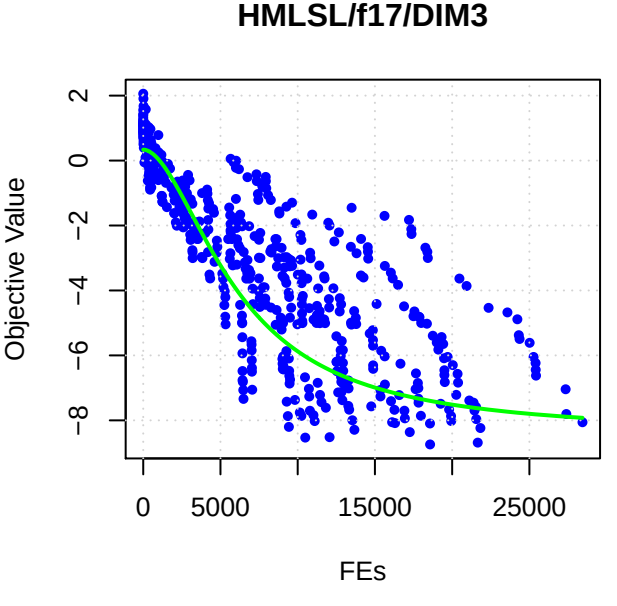
3e+05
4e+05


HMLSL/f17/DIM3
Objective Value
FEs
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−2
−4
−6
−8
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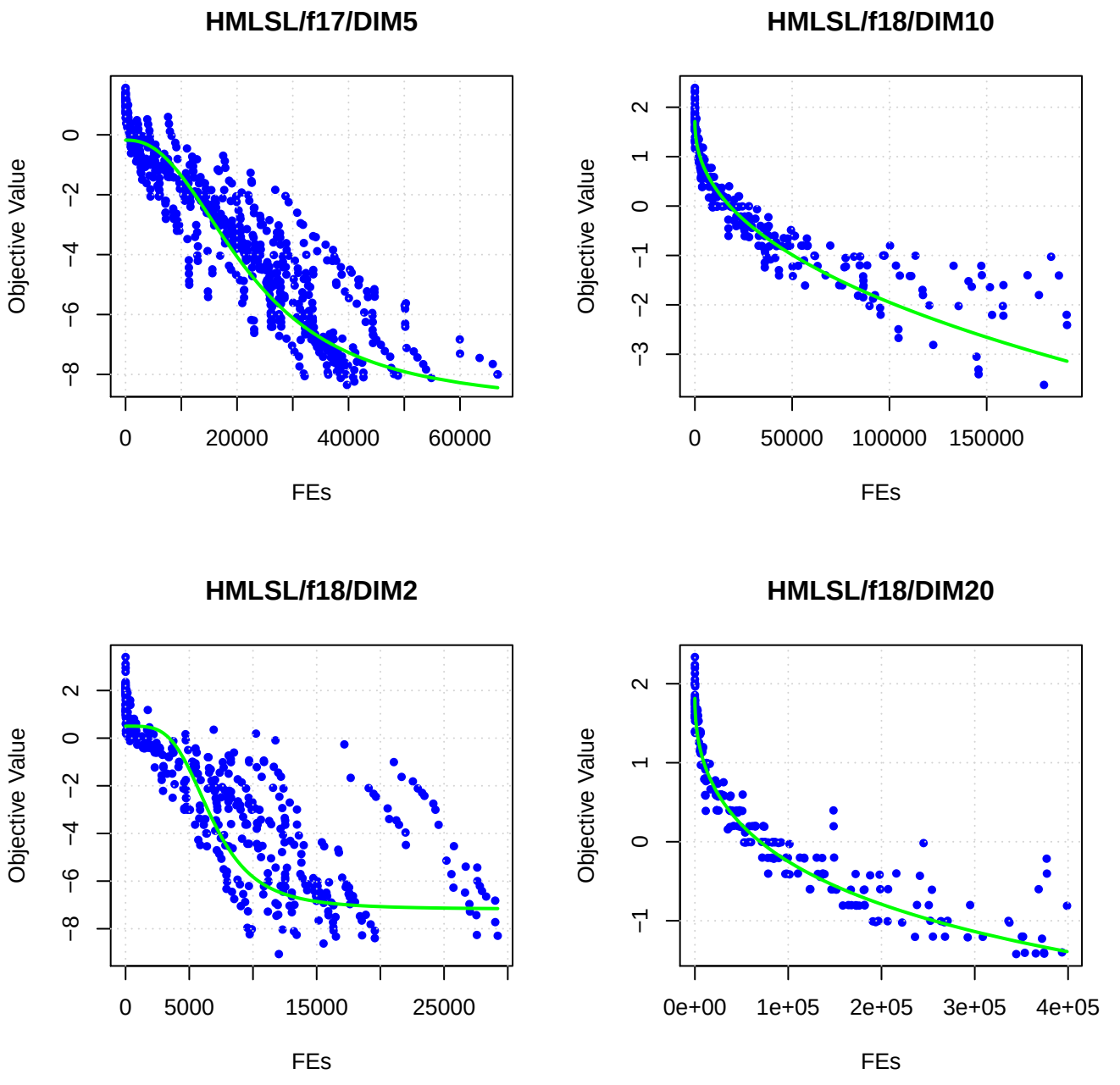
5000
15000
25000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Objective Value
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−4
−6
−8
0
20000
40000
60000
FEs
HMLSL/f18/DIM10
Objective Value
2
1
0
−1
−2
−3
0
50000
100000
150000
FEs
HMLSL/f18/DIM2
Objective Value
2
0
−2
−4
−6
−8
0
5000
15000
25000
FEs
HMLSL/f18/DIM20
Objective Value
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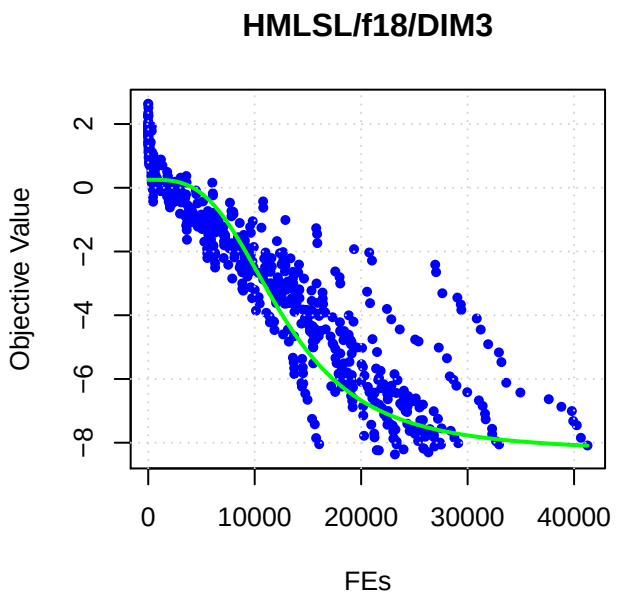
1
0
−1
0e+00
1e+05
2e+05
3e+05
4e+05
FEs


HMLSL/f18/DIM3
Objective Value
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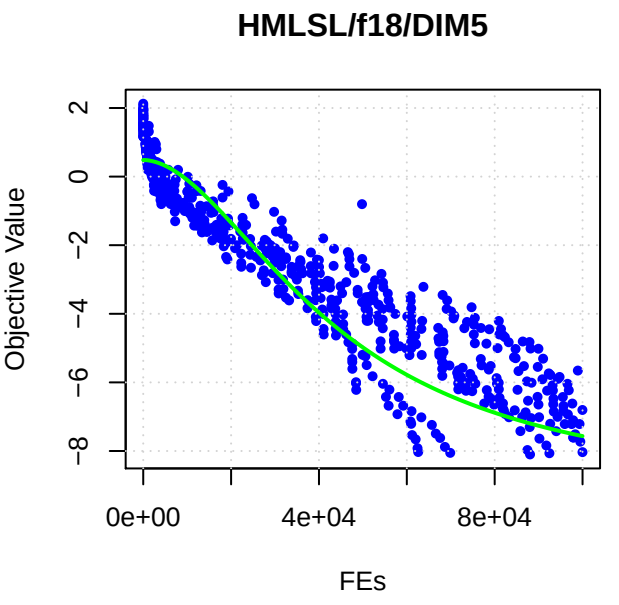
FEs


HMLSL/f18/DIM5
Objective Value
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−6
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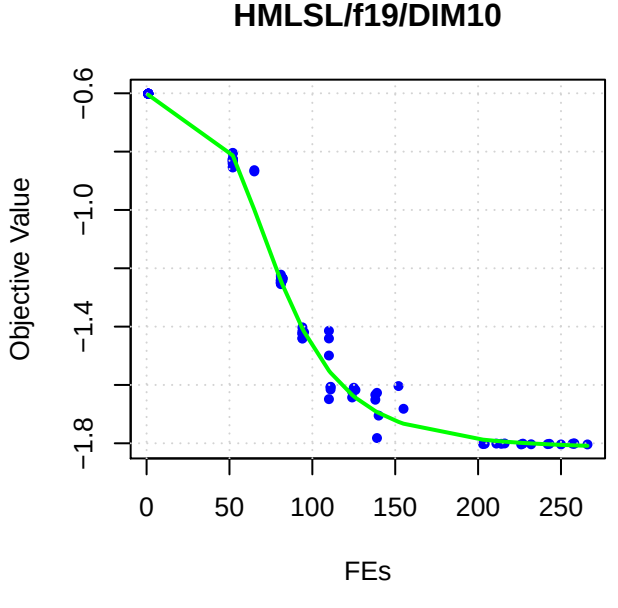
8e+04
FEs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Objective Value
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−1.0
−1.4
−1.8
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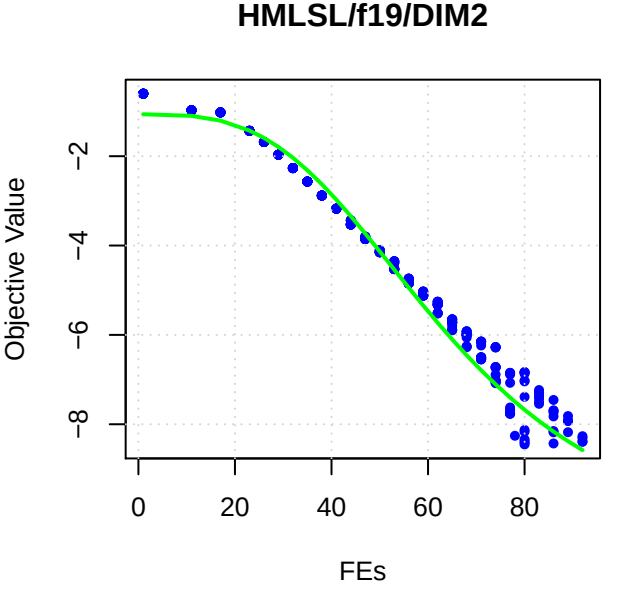
100
150
200
250
FEs


HMLSL/f19/DIM2
Objective Value
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−4
−6
−8
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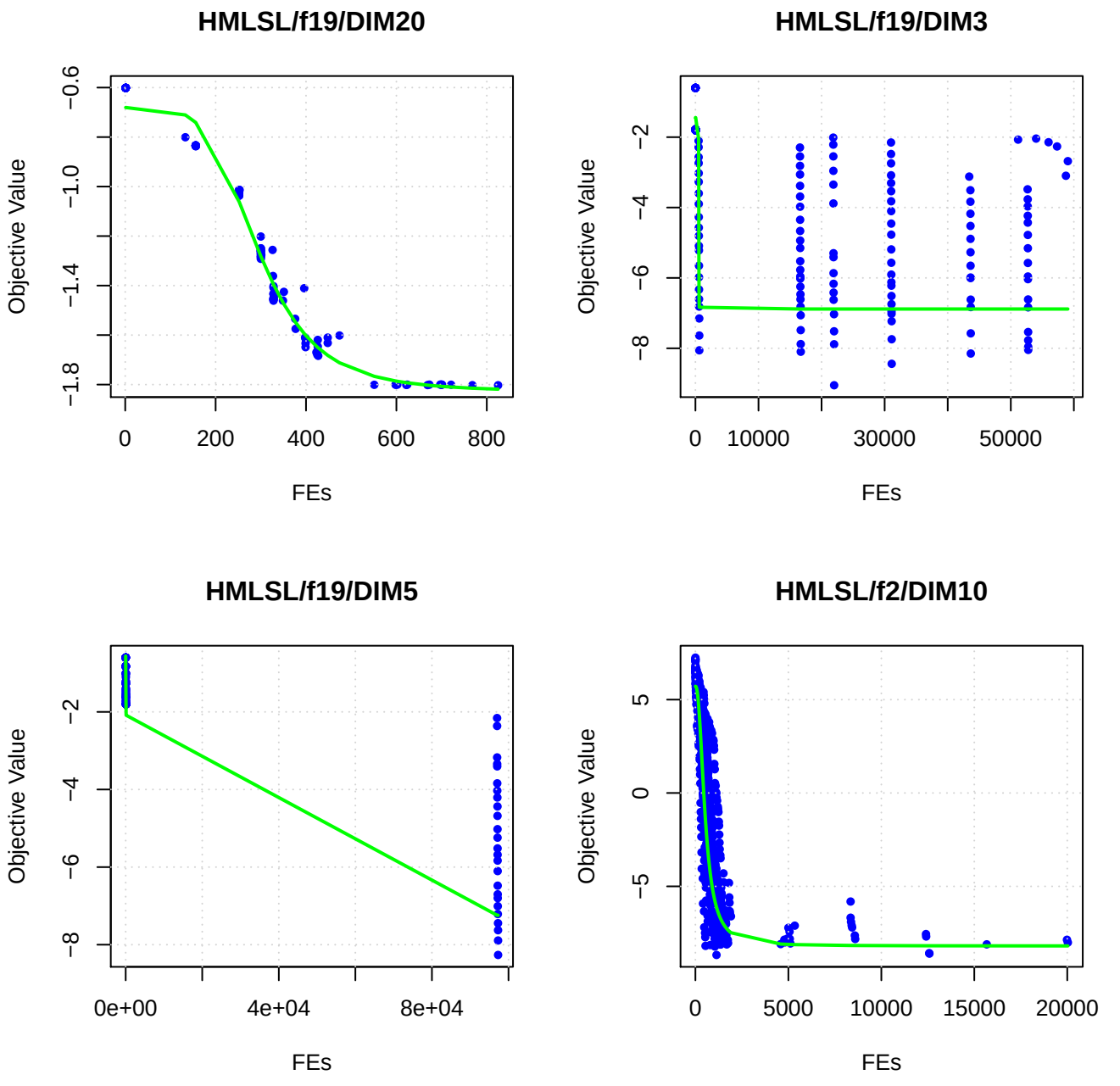
40
60
80
FEs


HMLSL/f19/DIM20
Objective Value
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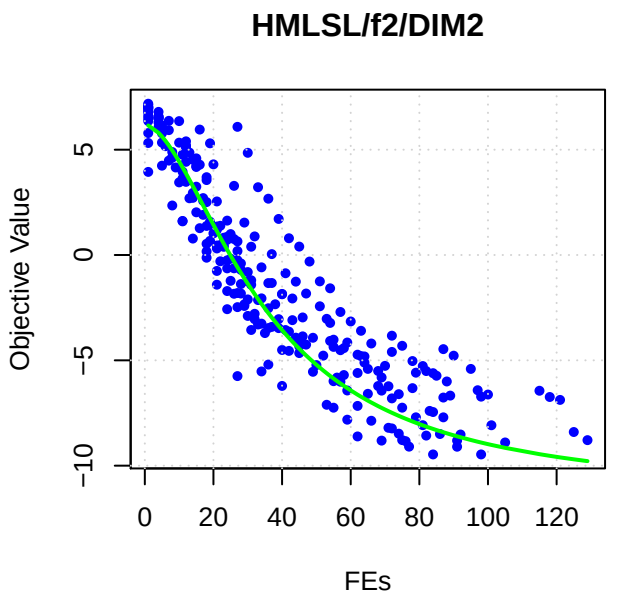
−1.0
−1.4
−1.8
0
200
400
600
800
FEs
HMLSL/f19/DIM3
Objective Value
−2
−4
−6
−8
0
10000
30000
50000
FEs
HMLSL/f19/DIM5
Objective Value
−2
−4
−6
−8
0e+00
4e+04
8e+04
FEs
HMLSL/f2/DIM10
Objective Value
5
0
−5
0
5000
10000
15000
20000
FEs


HMLSL/f2/DIM2
Objective Value
FEs
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−10
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60
80
100
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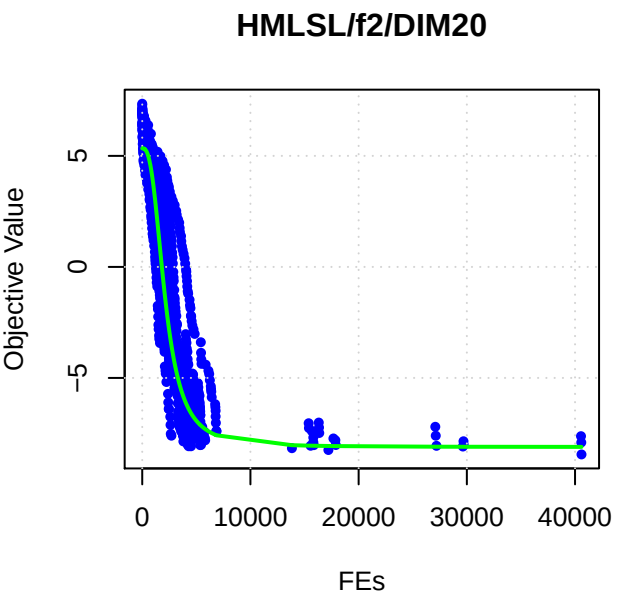
HMLSL/f2/DIM20
Objective Value
FEs
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10000
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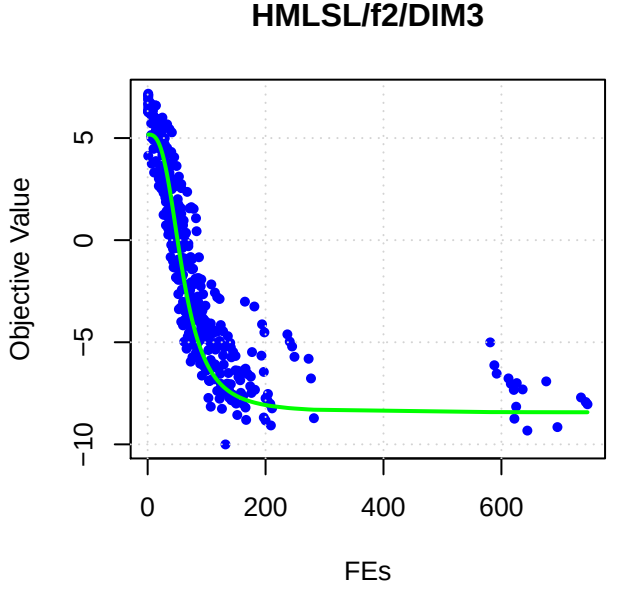
30000
40000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Objective Value
FEs
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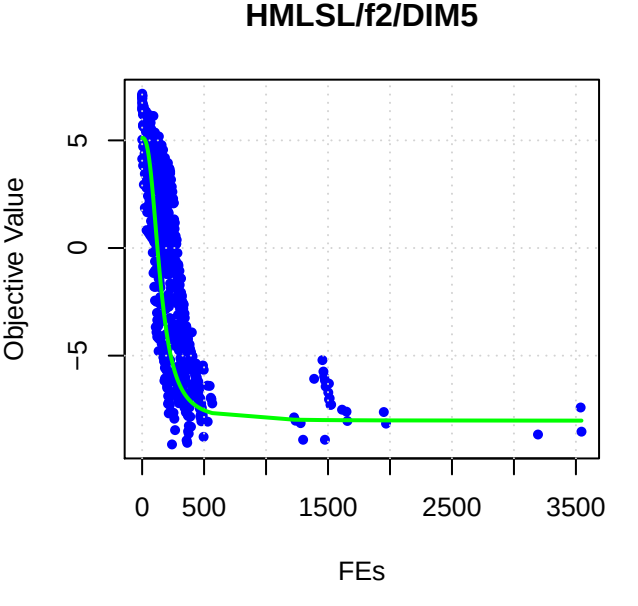
400
600


HMLSL/f2/DIM5
Objective Value
FEs
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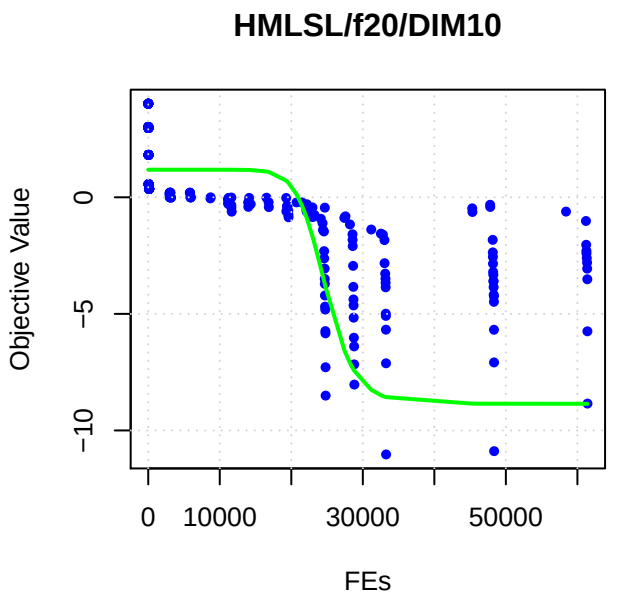
0
−5
0
500
1500
2500
3500


HMLSL/f20/DIM10
Objective Value
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−10
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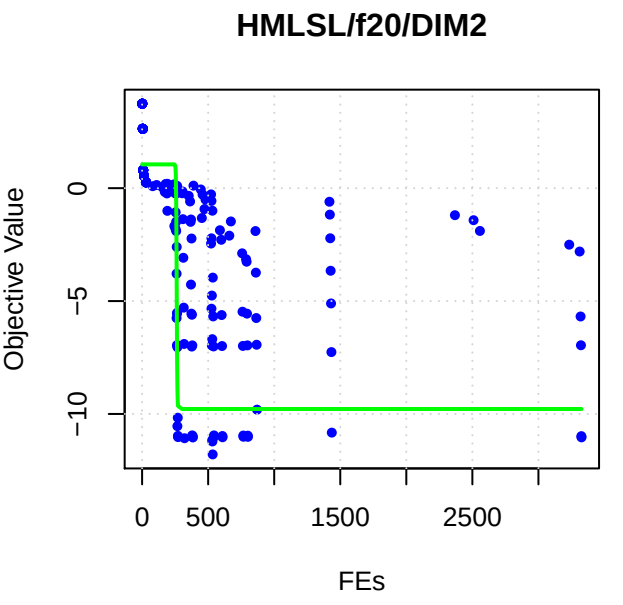
10000
30000
50000
FEs


HMLSL/f20/DIM2
Objective Value
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−10
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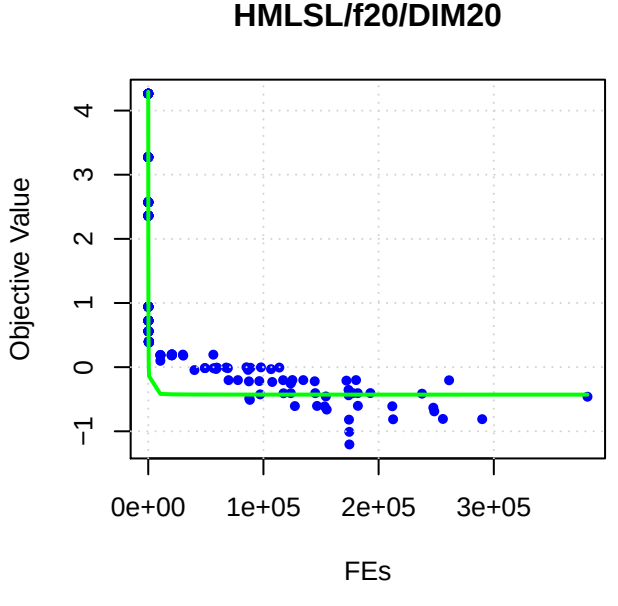
500
1500
2500
FEs


HMLSL/f20/DIM20
Objective Value
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2
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1e+05
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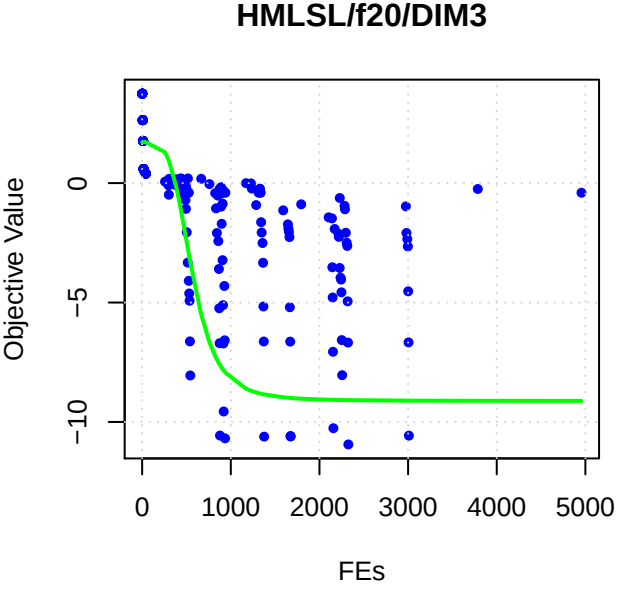
3e+05
FEs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Objective Value
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−10
0
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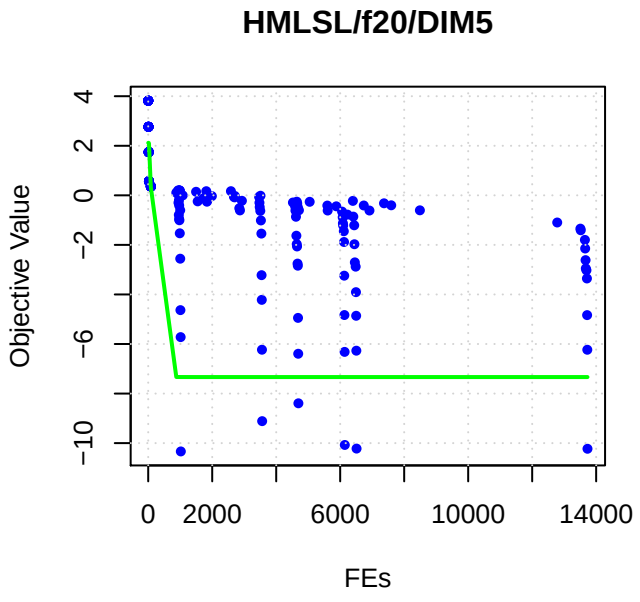
2000
3000
4000
5000
FEs


HMLSL/f20/DIM5
Objective Value
FEs
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2
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−10
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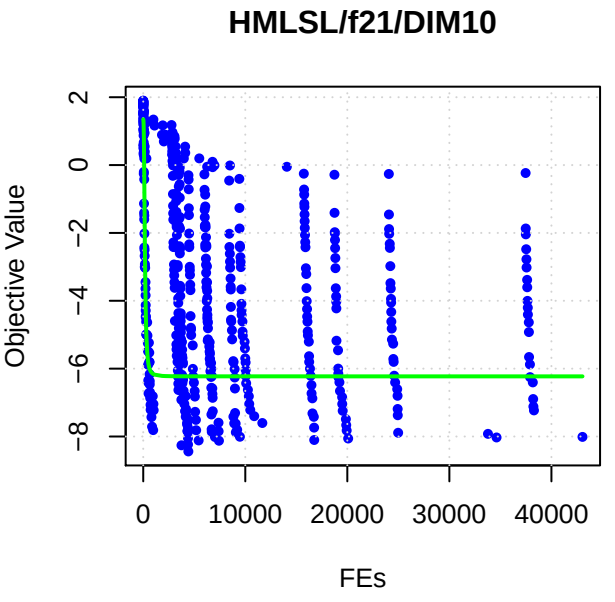
2000
6000
10000
14000


HMLSL/f21/DIM10
Objective Value
FEs
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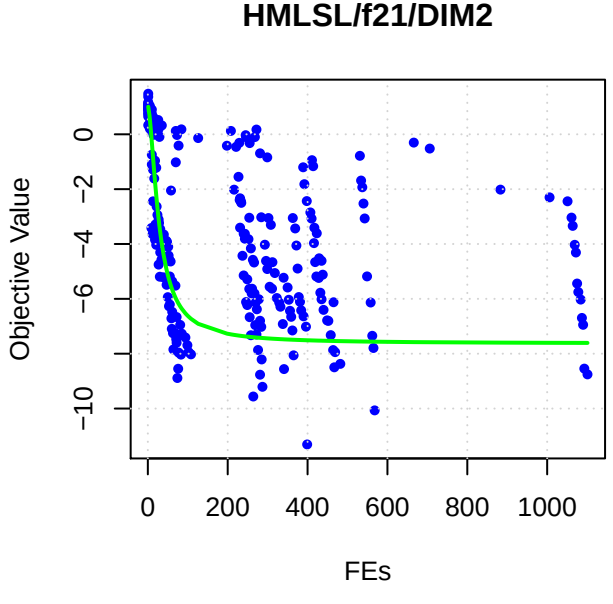
30000
40000


HMLSL/f21/DIM2
Objective Value
FEs
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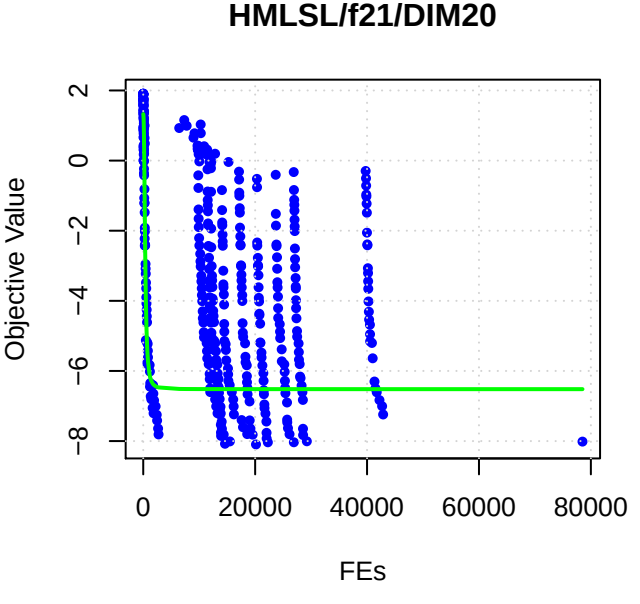
600
800
1000


HMLSL/f21/DIM20
Objective Value
FEs
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−4
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40000
60000
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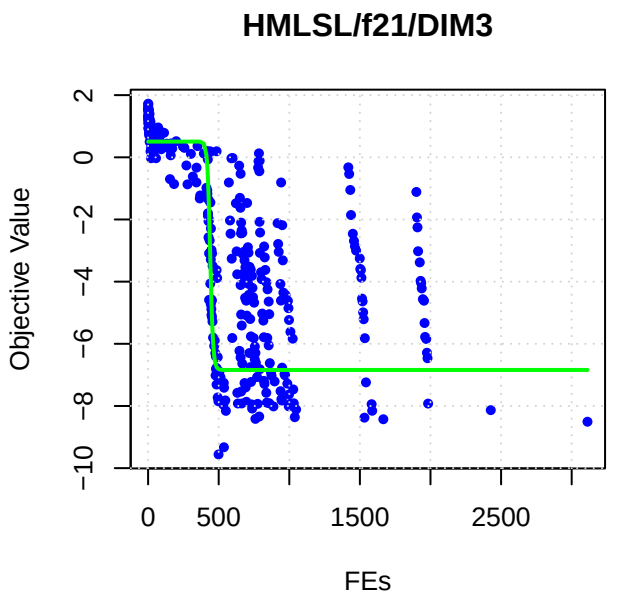
HMLSL/f21/DIM3
Objective Value
FEs
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−4
−6
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−10
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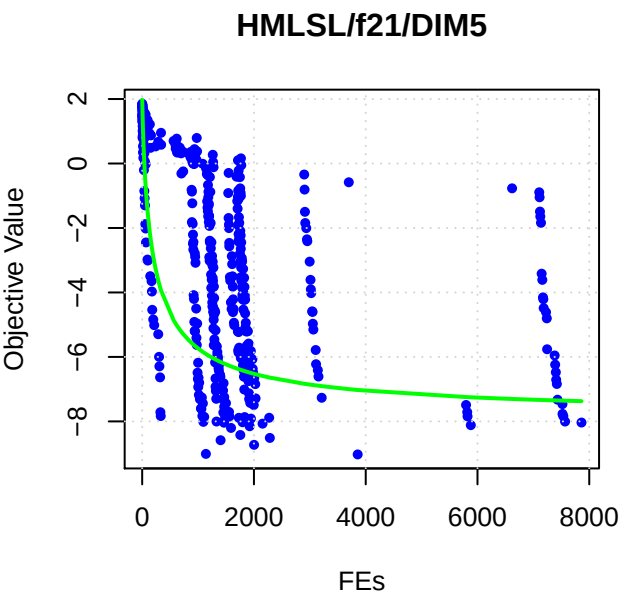
1500
2500


HMLSL/f21/DIM5
Objective Value
FEs
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−4
−6
−8
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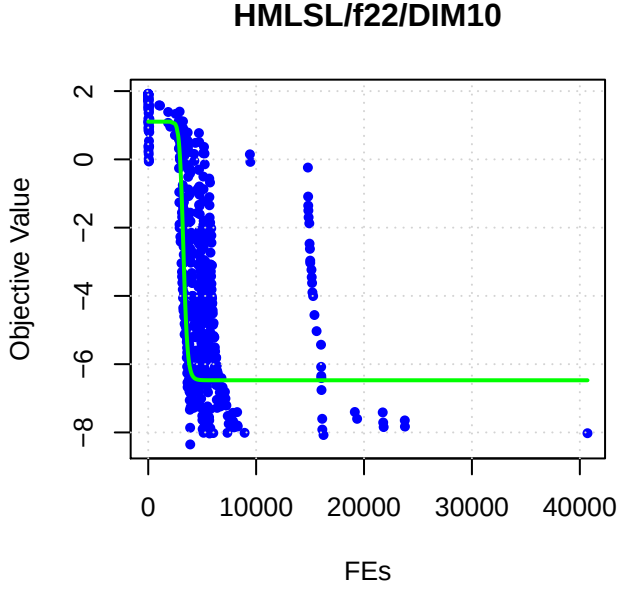
4000
6000
8000


HMLSL/f22/DIM10
Objective Value
FEs
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−6
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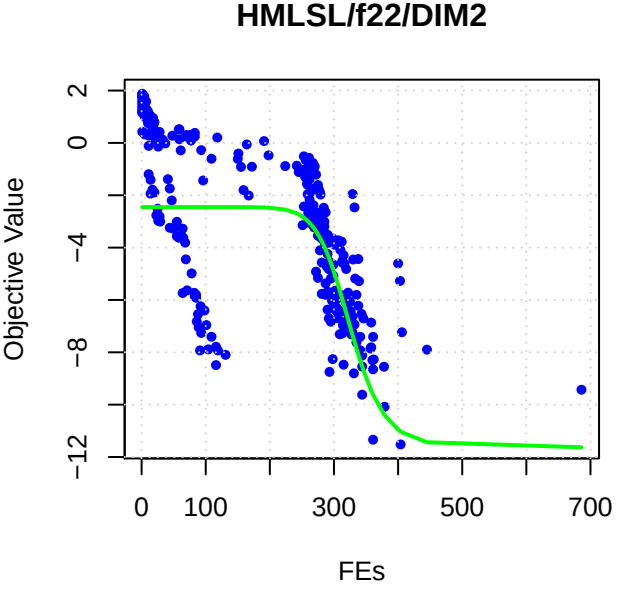
30000
40000


HMLSL/f22/DIM2
Objective Value
FEs
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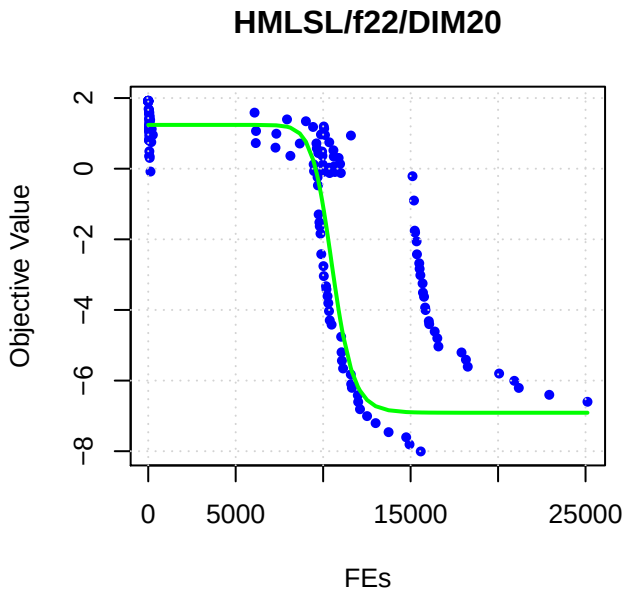
300
500
700


HMLSL/f22/DIM20
Objective Value
FEs
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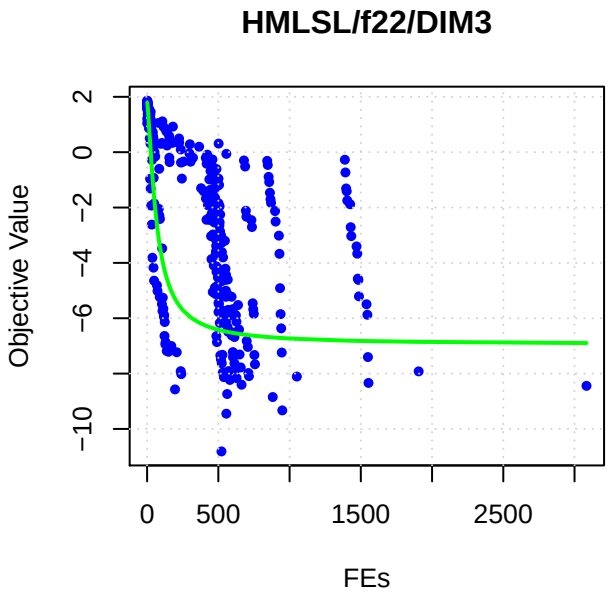
15000
25000


HMLSL/f22/DIM3
Objective Value
FEs
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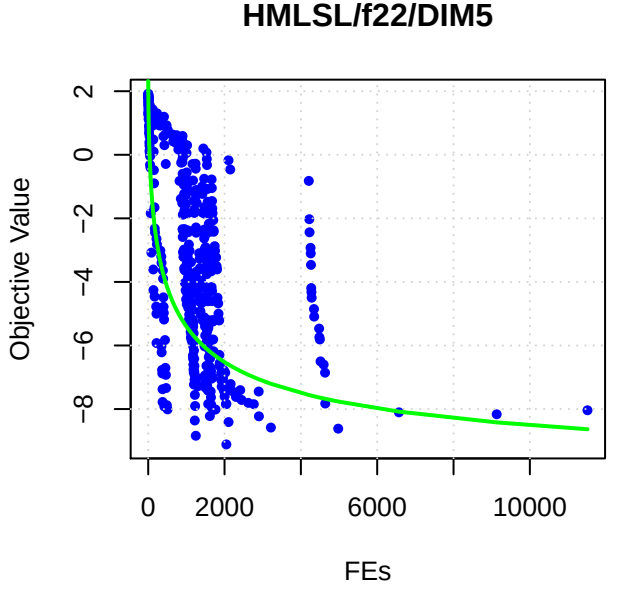
−4
−6
−10
0
500
1500
2500


HMLSL/f22/DIM5
Objective Value
FEs
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−4
−6
−8
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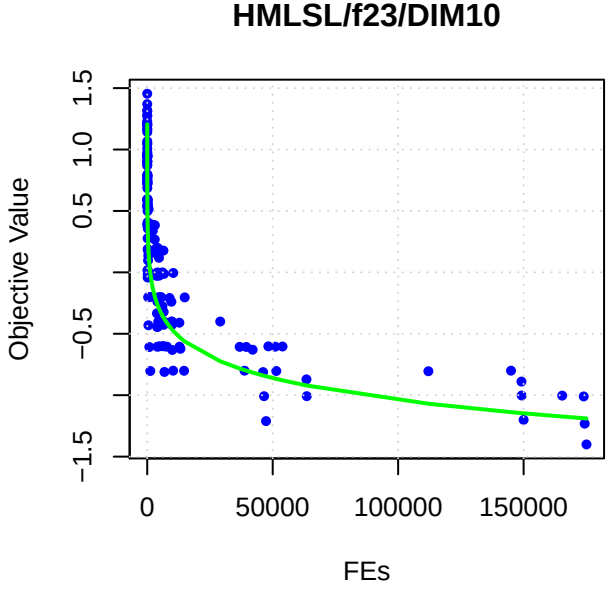
6000
10000


HMLSL/f23/DIM10
Objective Value
FEs
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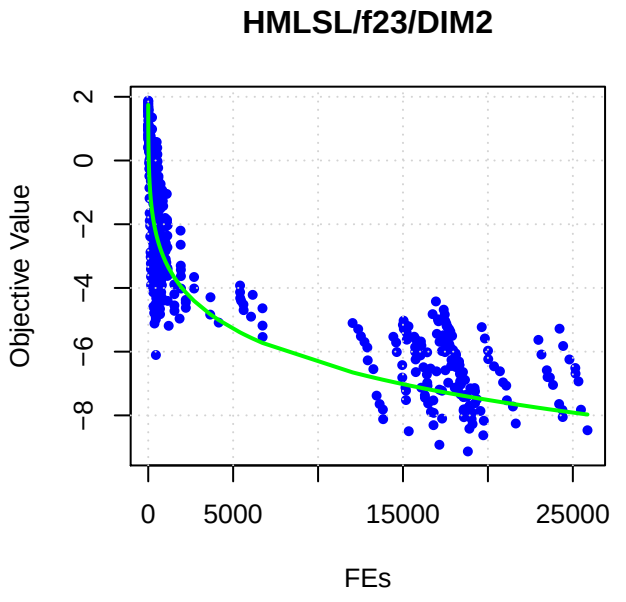
100000
150000


HMLSL/f23/DIM2
Objective Value
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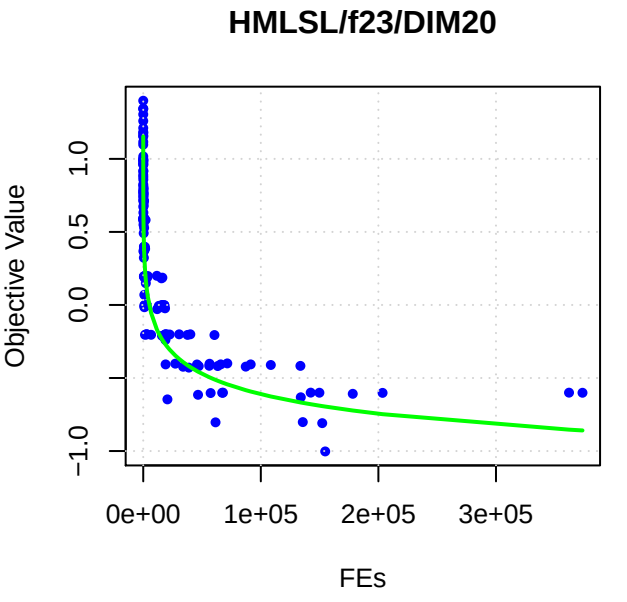
−6
−8
0
5000
15000
25000
FEs


HMLSL/f23/DIM20
Objective Value
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0.0
−1.0
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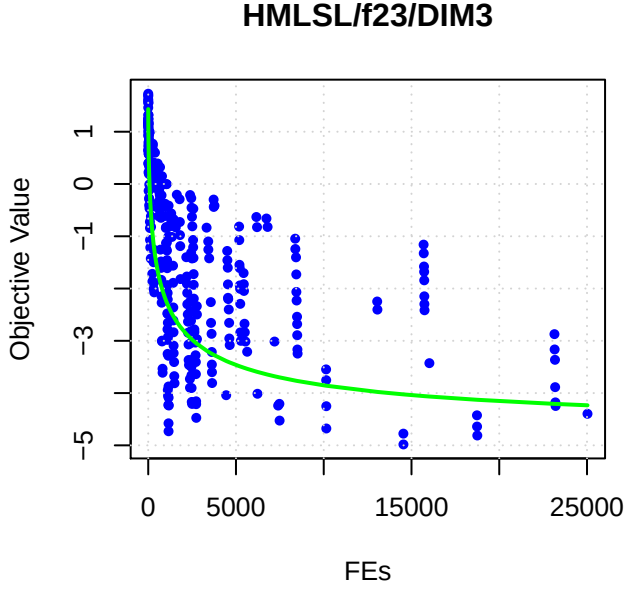
1e+05
2e+05
3e+05
FEs


HMLSL/f23/DIM3
Objective Value
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−3
−5
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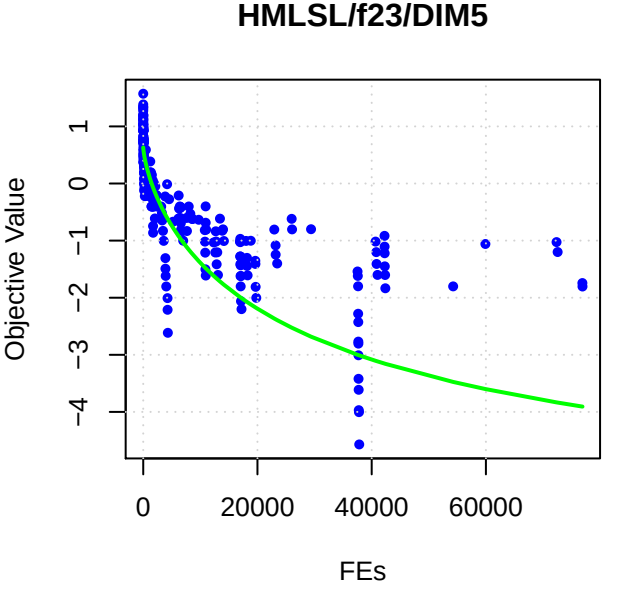
15000
25000
FEs


HMLSL/f23/DIM5
Objective Value
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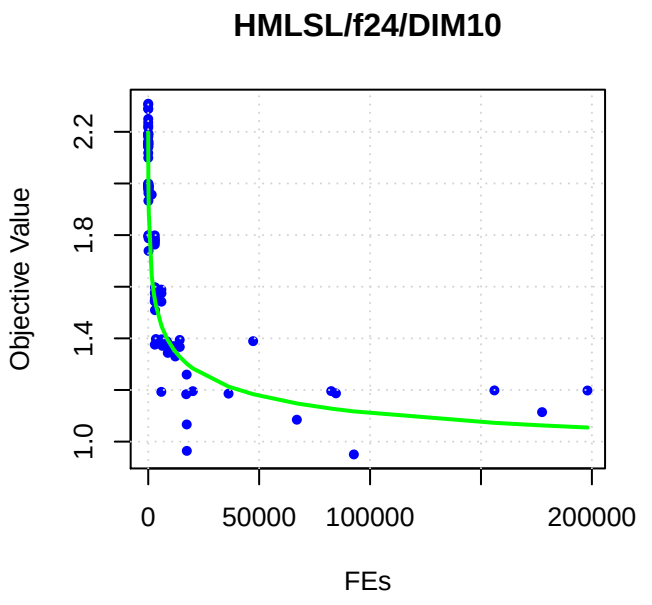
40000
60000
FEs


HMLSL/f24/DIM10
Objective Value
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1.8
2.2
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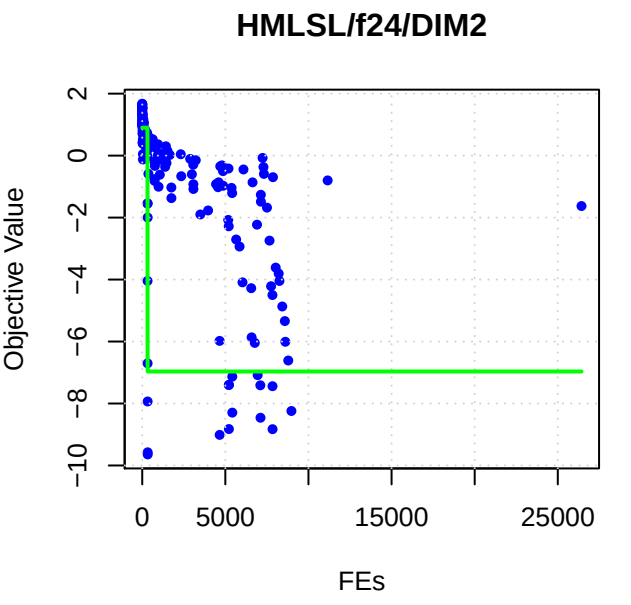
100000
200000
FEs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Objective Value
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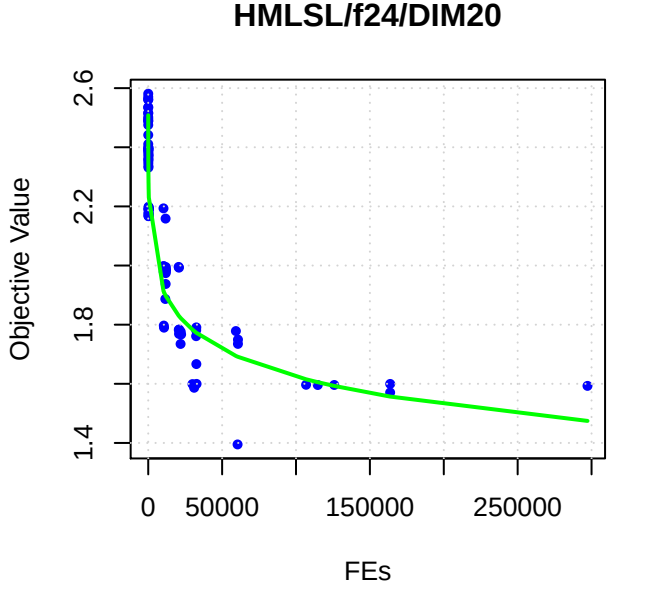
−6
−4
−2
0
2
0
5000
15000
25000
FEs


HMLSL/f24/DIM20
Objective Value
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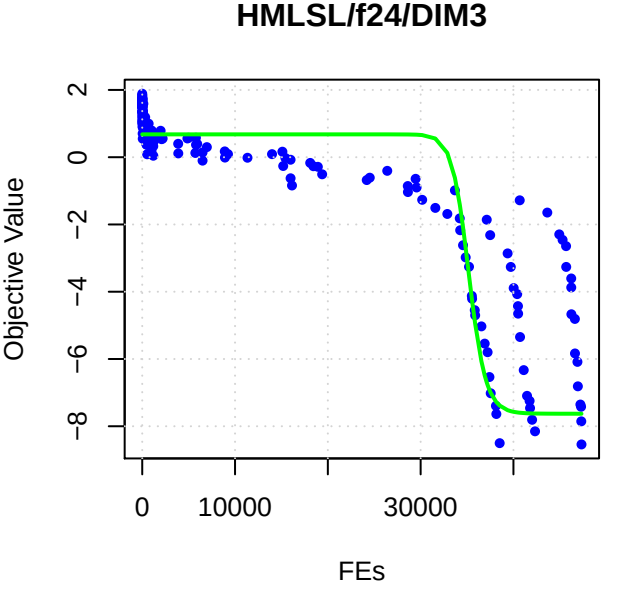
1.8
2.2
2.6
0
50000
150000
250000
FEs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Objective Value
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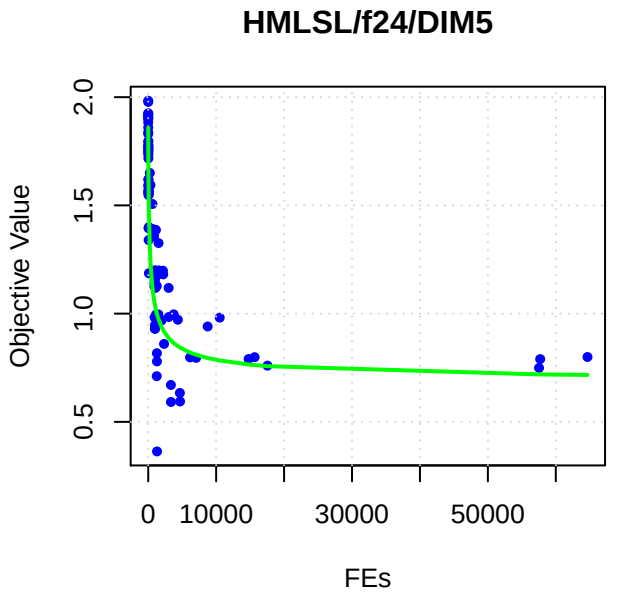
−6
−4
−2
0
2
0
10000
30000
FEs


HMLSL/f24/DIM5
Objective Value
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1.0
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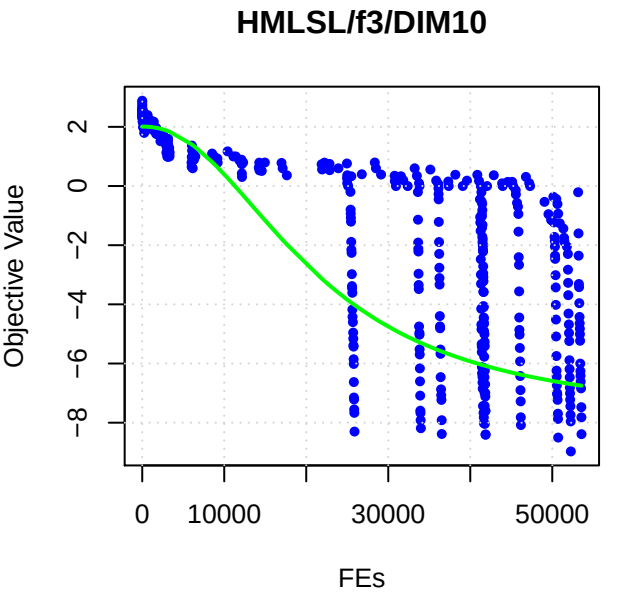
30000
50000
FEs


HMLSL/f3/DIM10
Objective Value
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−2
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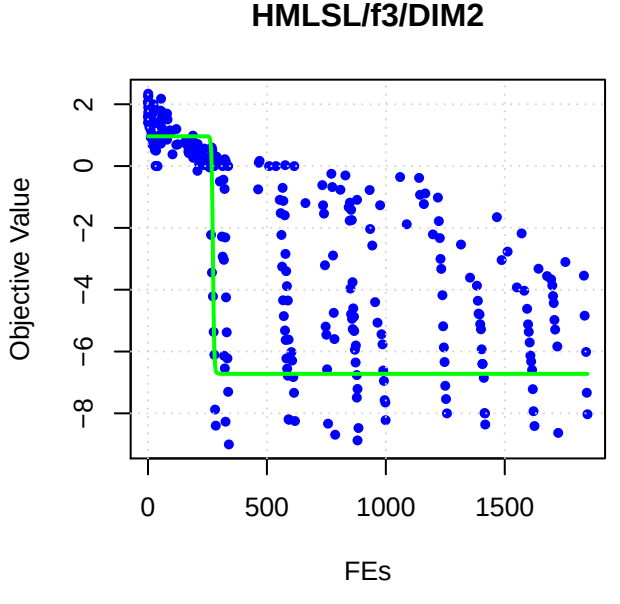
30000
50000
FEs


HMLSL/f3/DIM2
Objective Value
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−2
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−6
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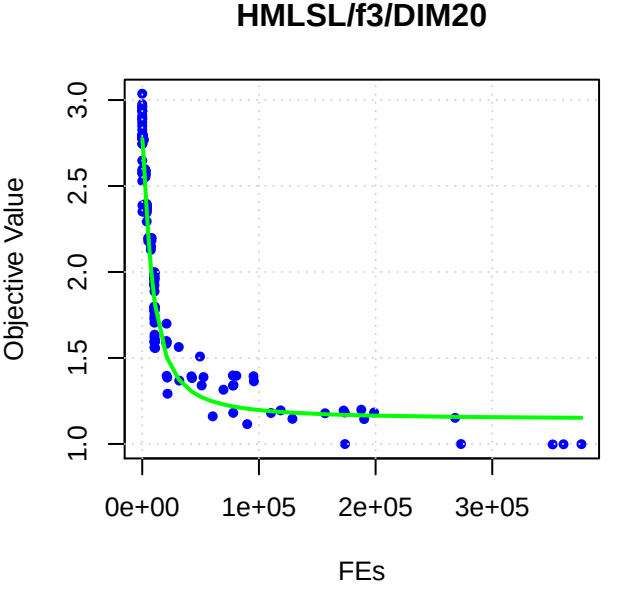
1000
1500
FEs


HMLSL/f3/DIM20
Objective Value
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2.5
2.0
1.5
1.0
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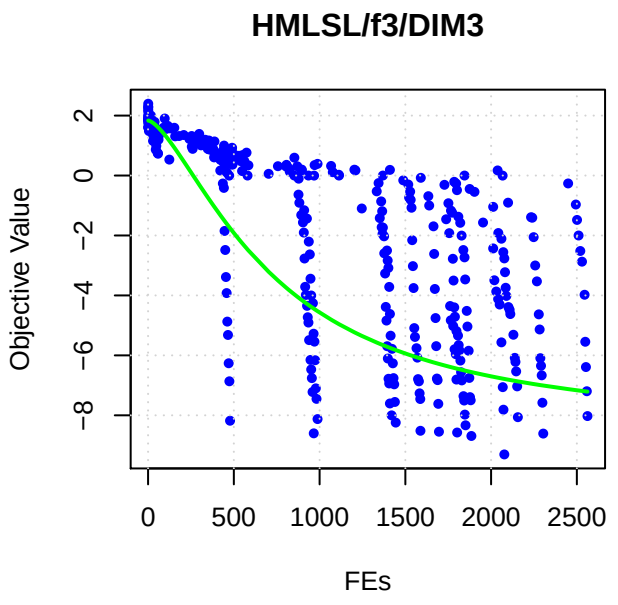
1e+05
2e+05
3e+05
FEs


HMLSL/f3/DIM3
Objective Value
FEs
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1500
2000
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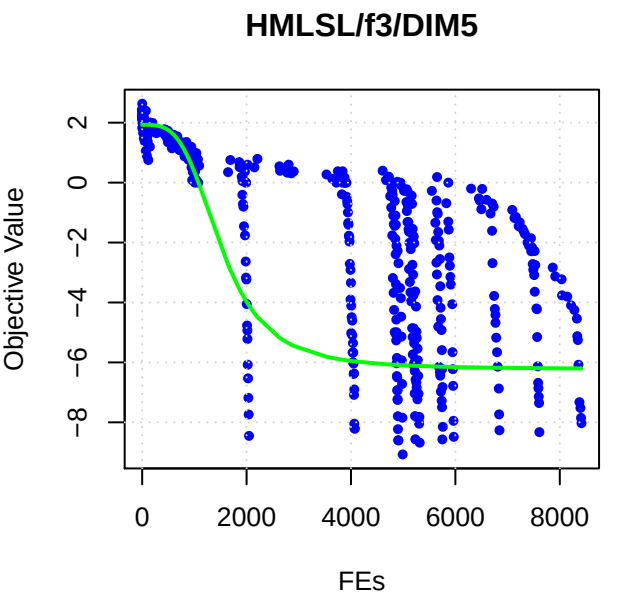
HMLSL/f3/DIM5
Objective Value
FEs
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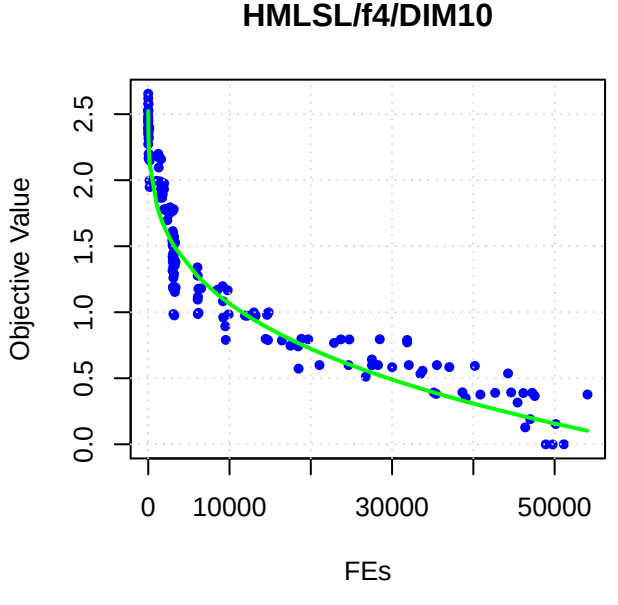
8000


HMLSL/f4/DIM10
Objective Value
FEs
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1.5
1.0
0.5
0.0
0
10000
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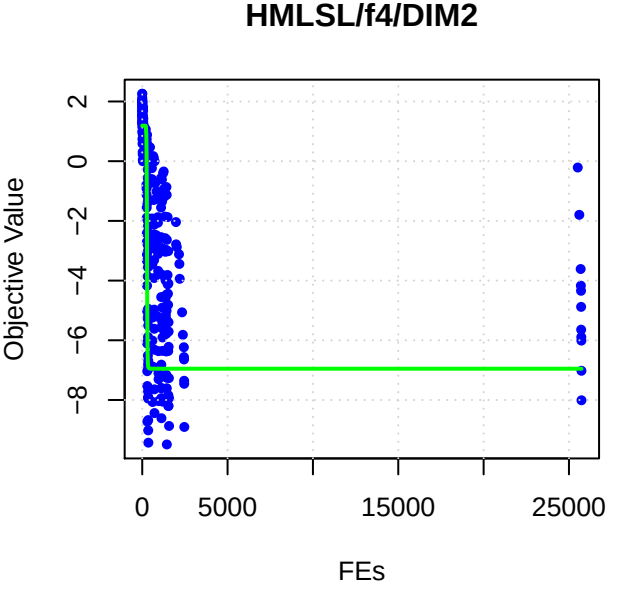
50000


HMLSL/f4/DIM2
Objective Value
FEs
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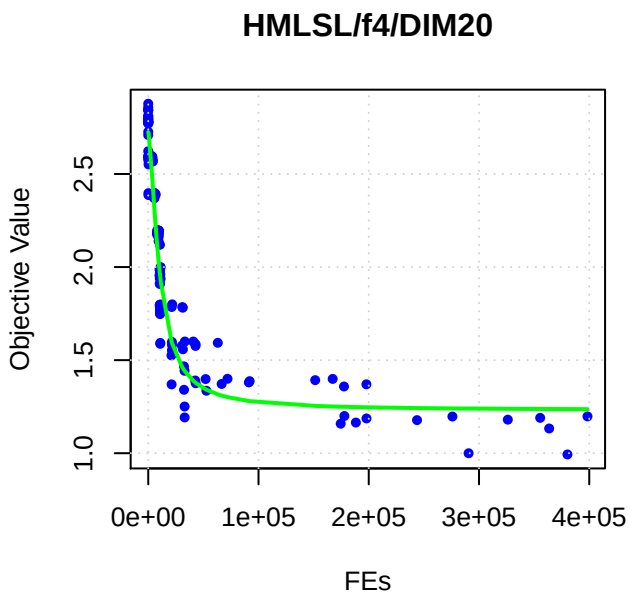
15000
25000


HMLSL/f4/DIM20
Objective Value
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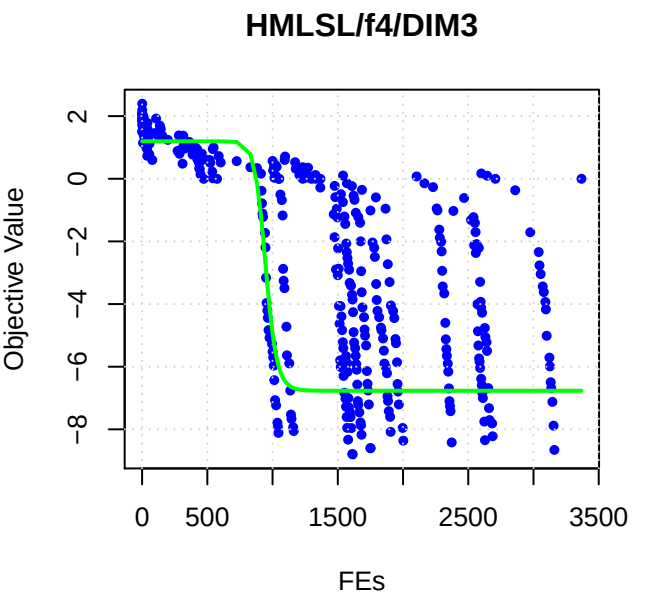
FEs


HMLSL/f4/DIM3
Objective Value
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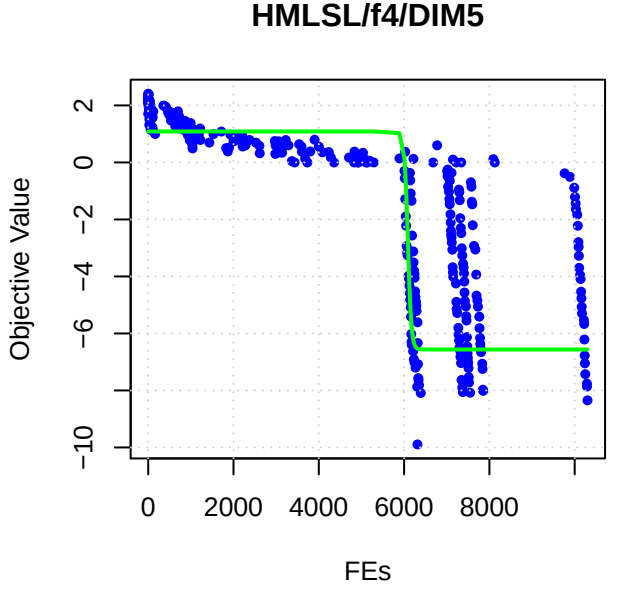
2500
3500
FEs


HMLSL/f4/DIM5
Objective Value
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4000
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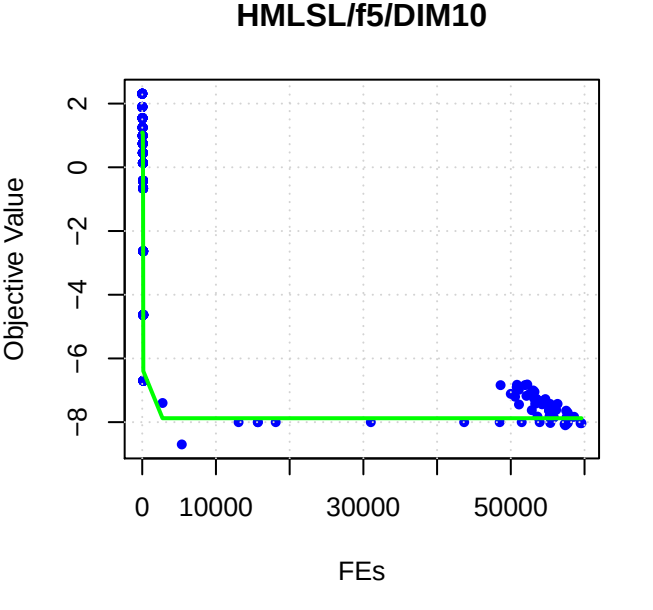
8000
FEs


HMLSL/f5/DIM10
Objective Value
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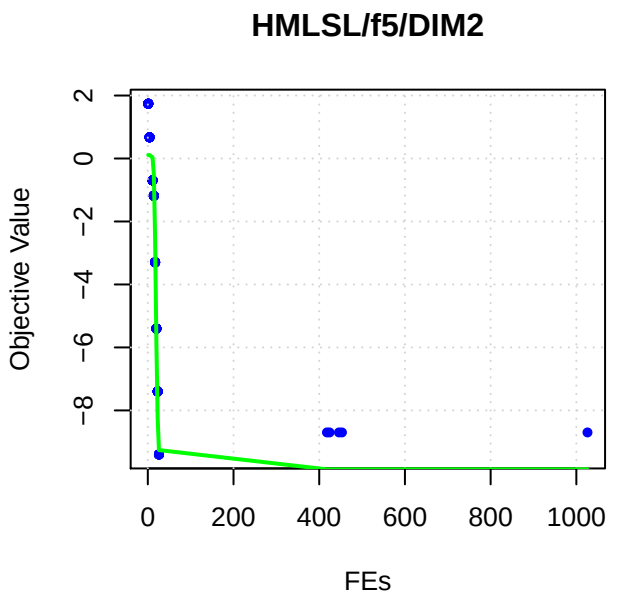
FEs


HMLSL/f5/DIM2
Objective Value
FEs
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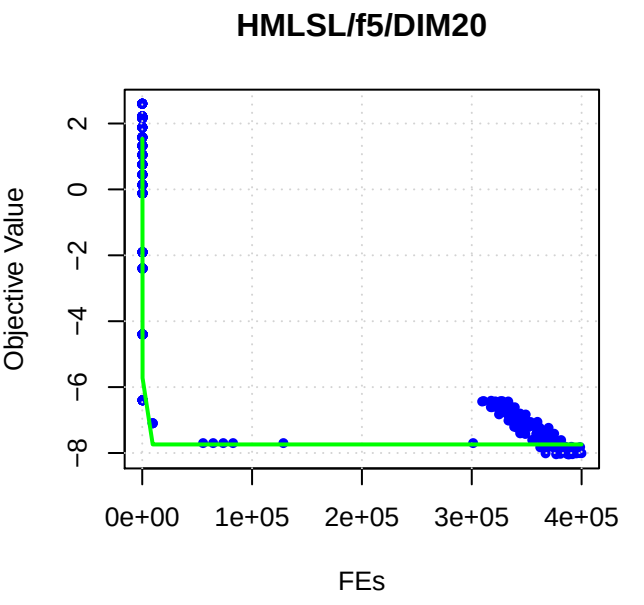
HMLSL/f5/DIM20
Objective Value
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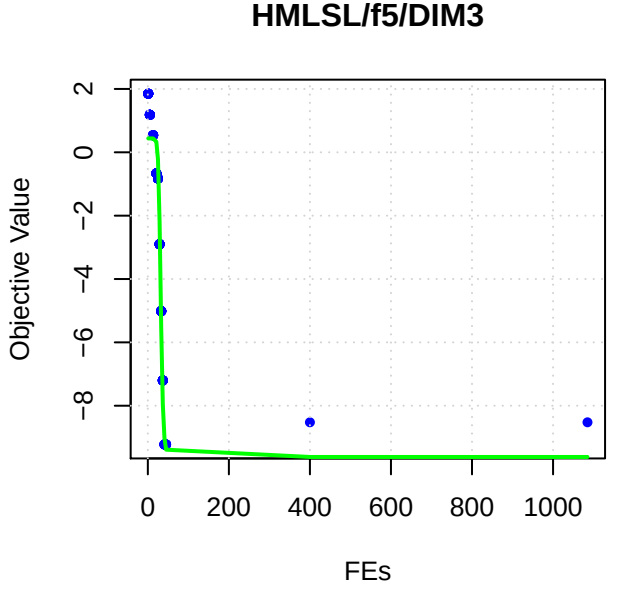
4e+05


HMLSL/f5/DIM3
Objective Value
FEs
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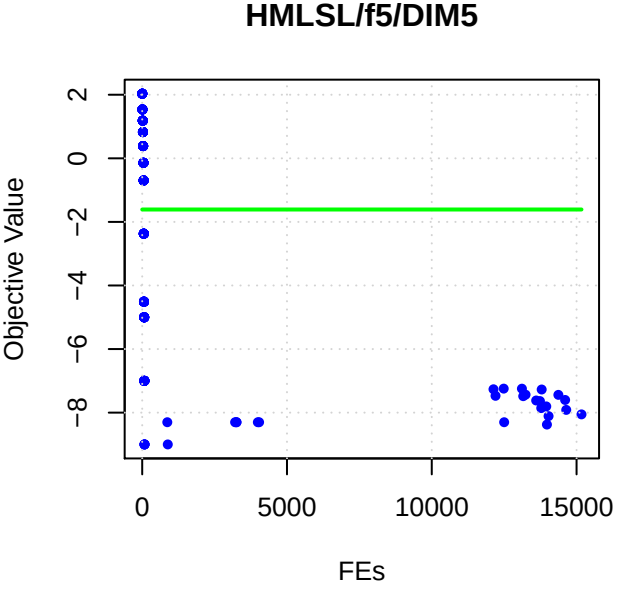
HMLSL/f5/DIM5
Objective Value
FEs
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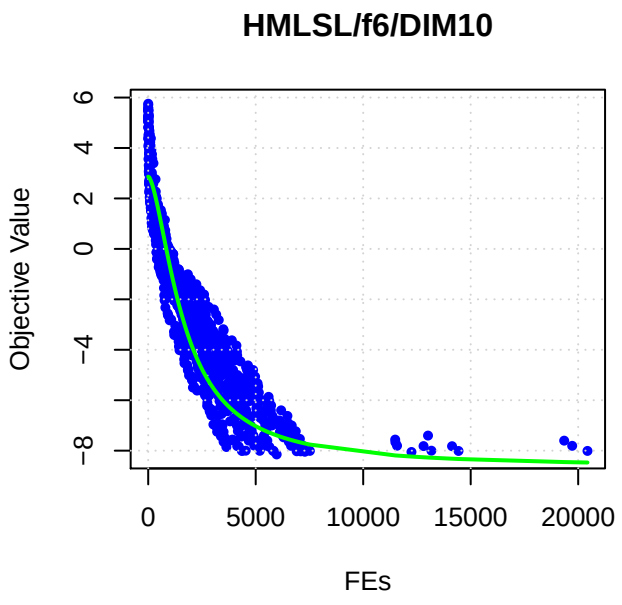
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Objective Value
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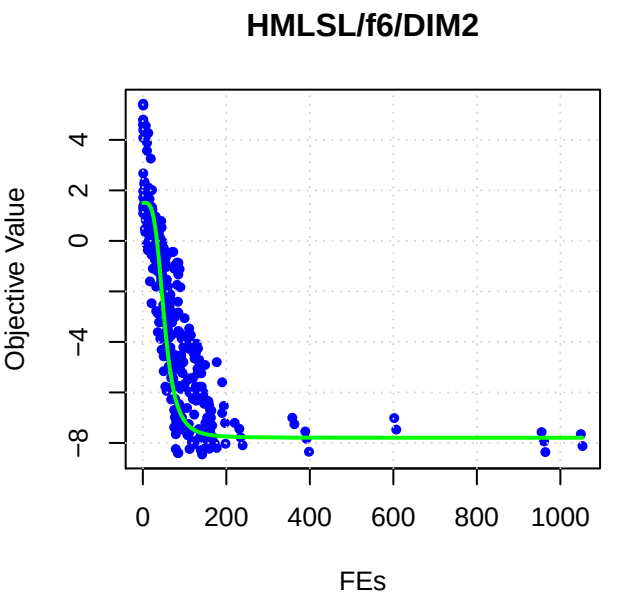
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Objective Value
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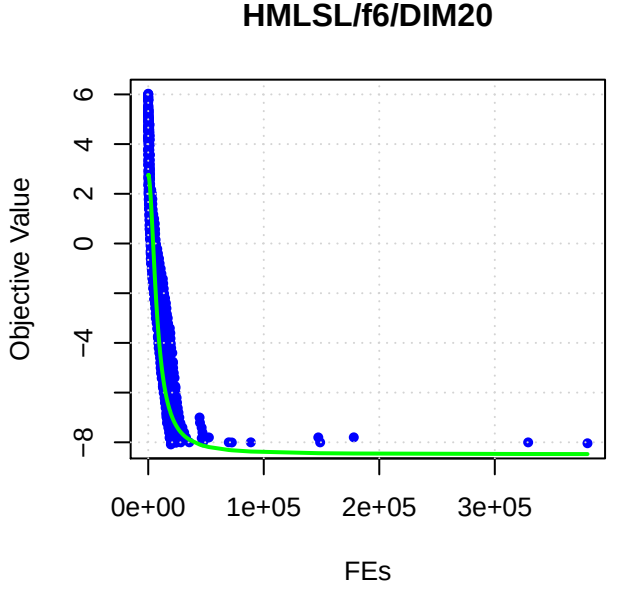
HMLSL/f6/DIM20
Objective Value
FEs
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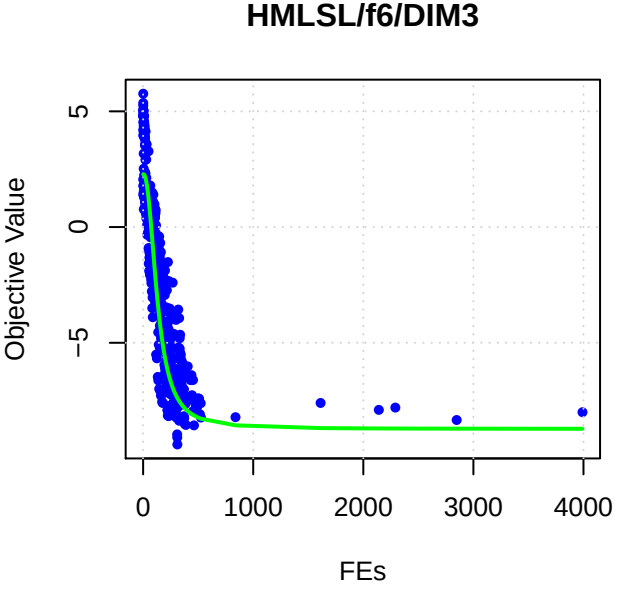
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Objective Value
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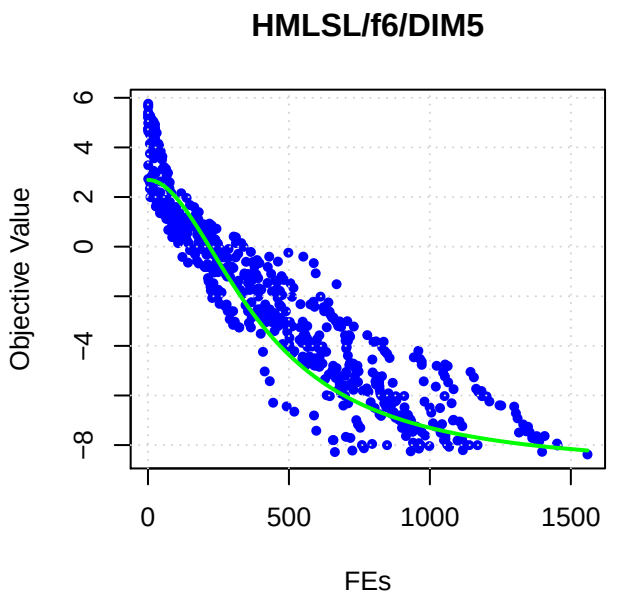
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Objective Value
FEs
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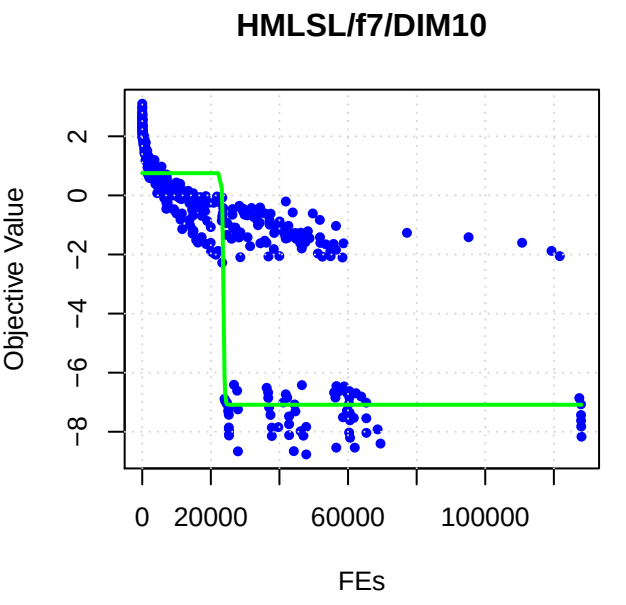
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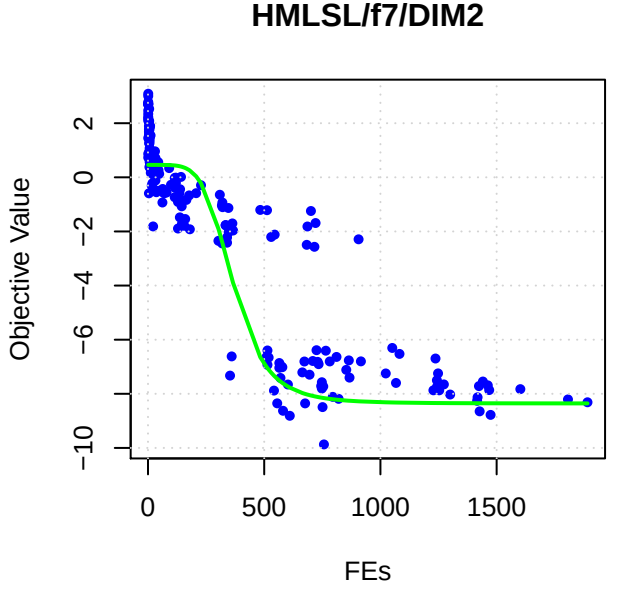
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Objective Value
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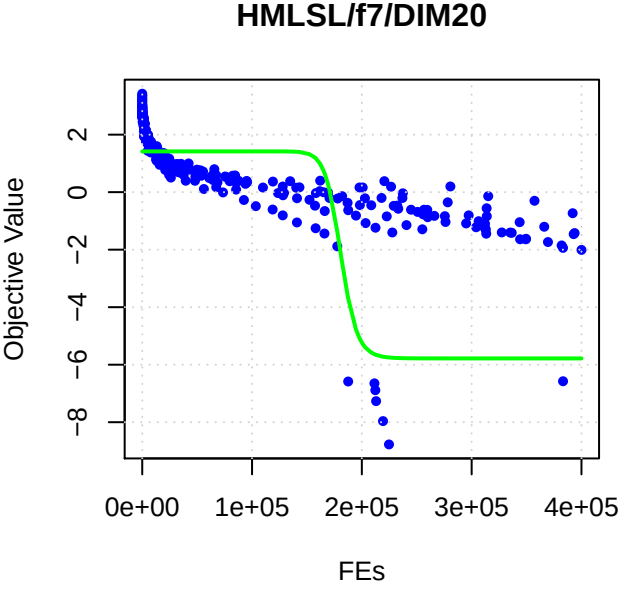
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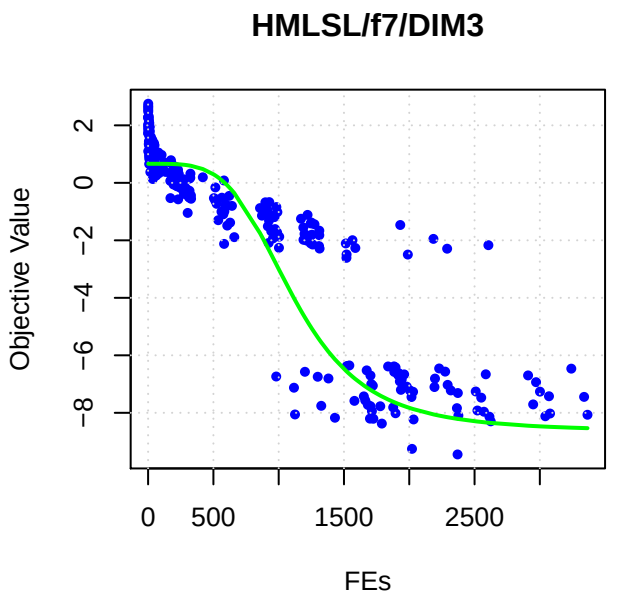
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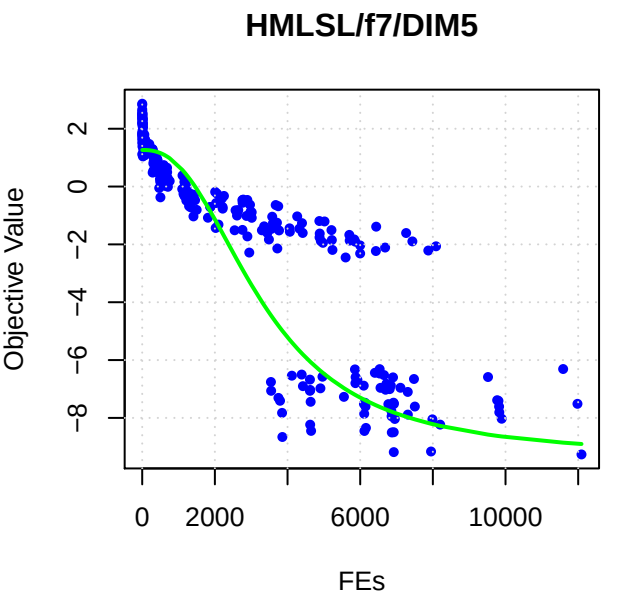
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Objective Value
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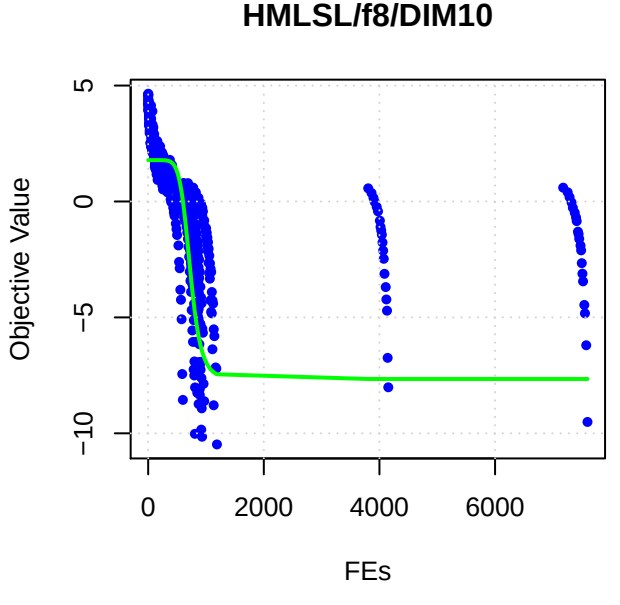
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Objective Value
FEs
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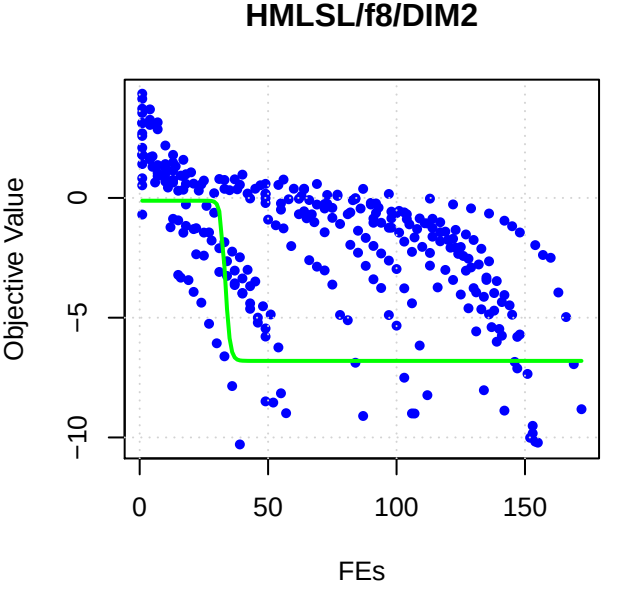
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Objective Value
FEs
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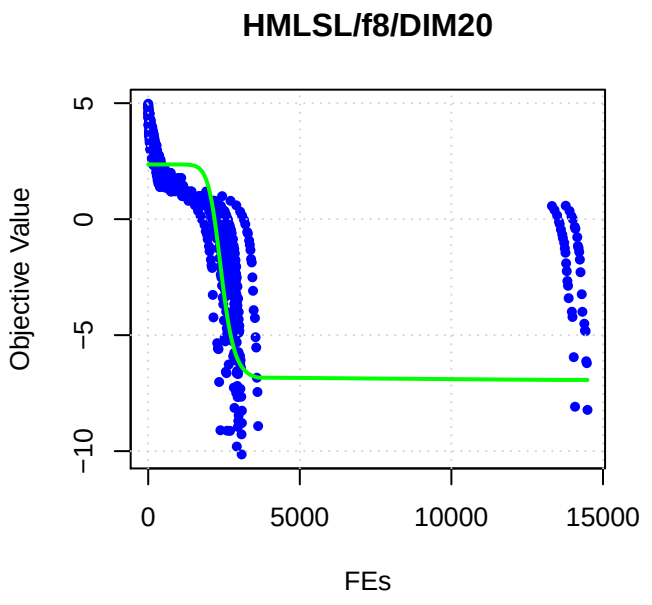
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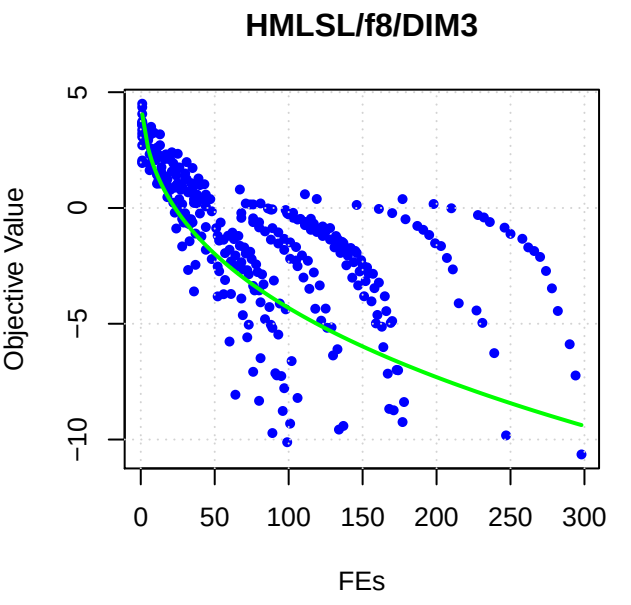
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Objective Value
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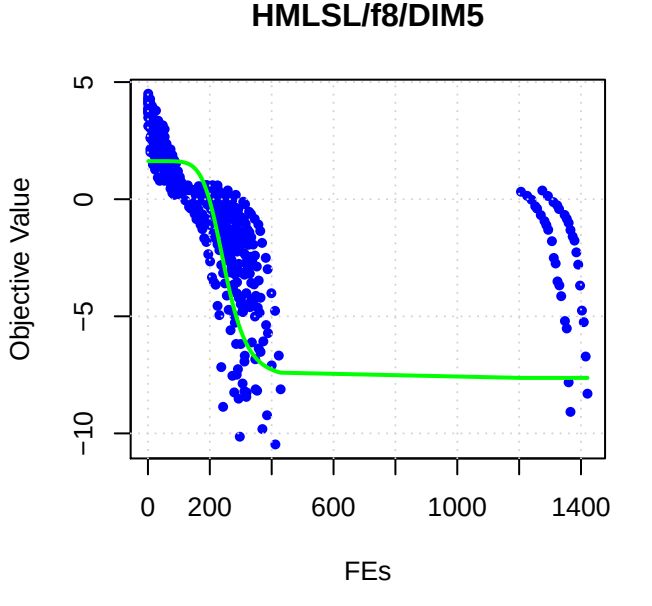
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Objective Value
FEs
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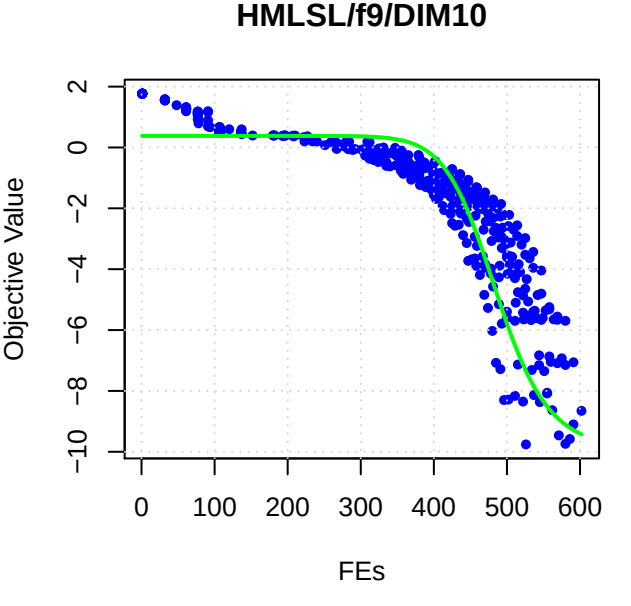
600
1000
1400


HMLSL/f9/DIM10
Objective Value
FEs
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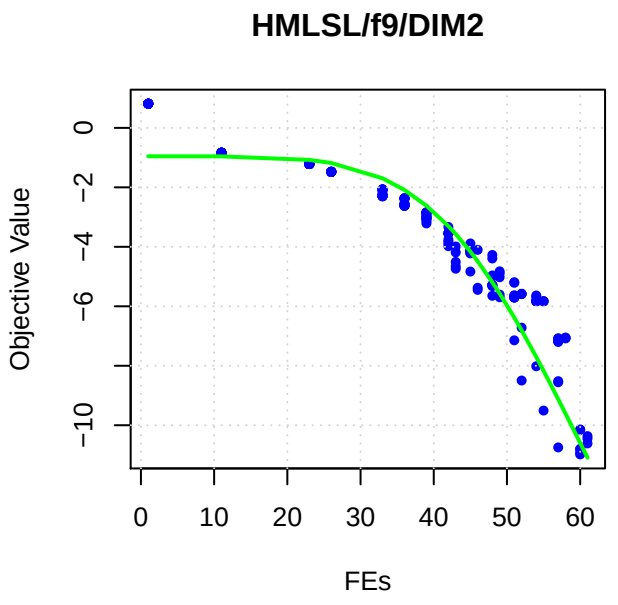
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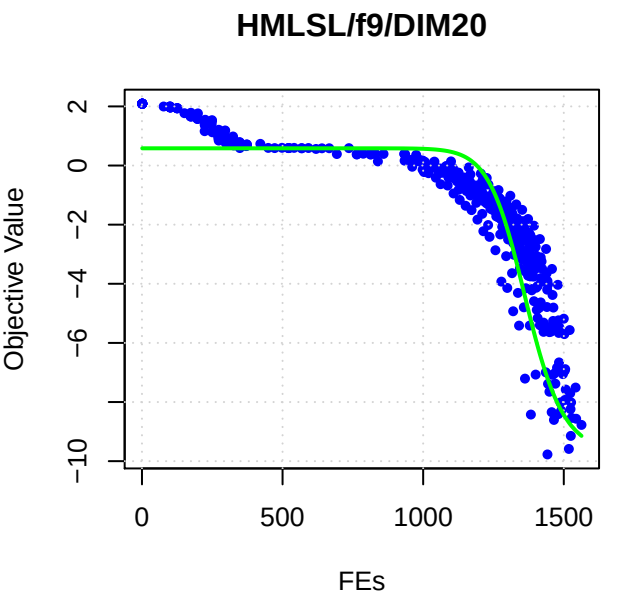
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1000
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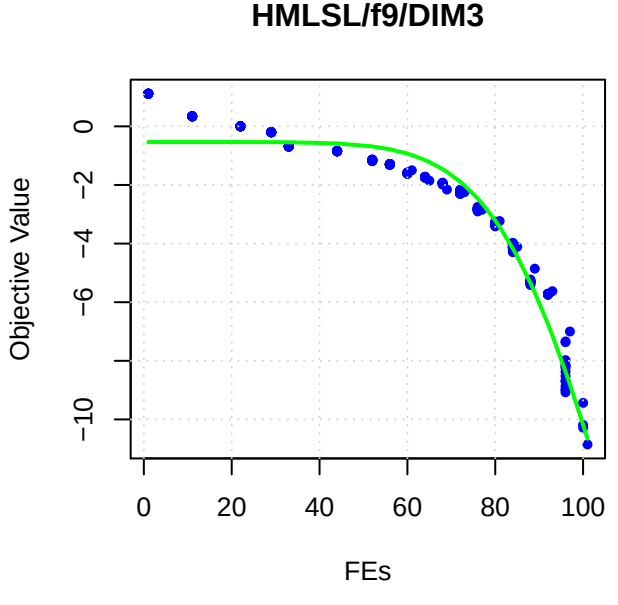
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FEs
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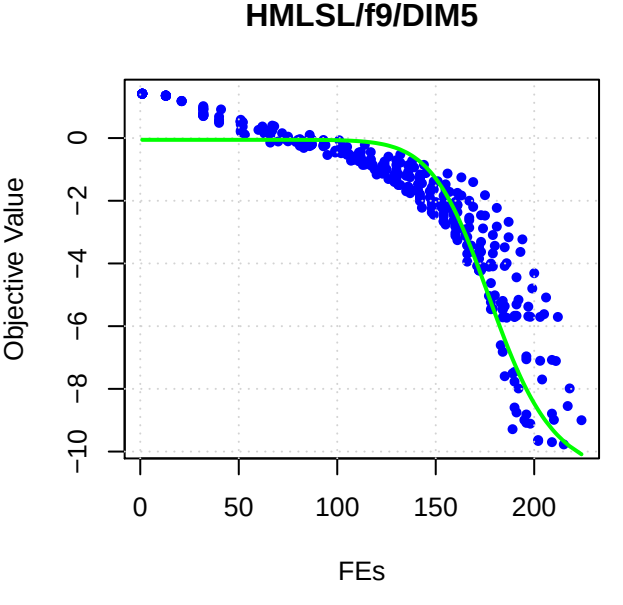
HMLSL/f9/DIM5
Objective Value
FEs
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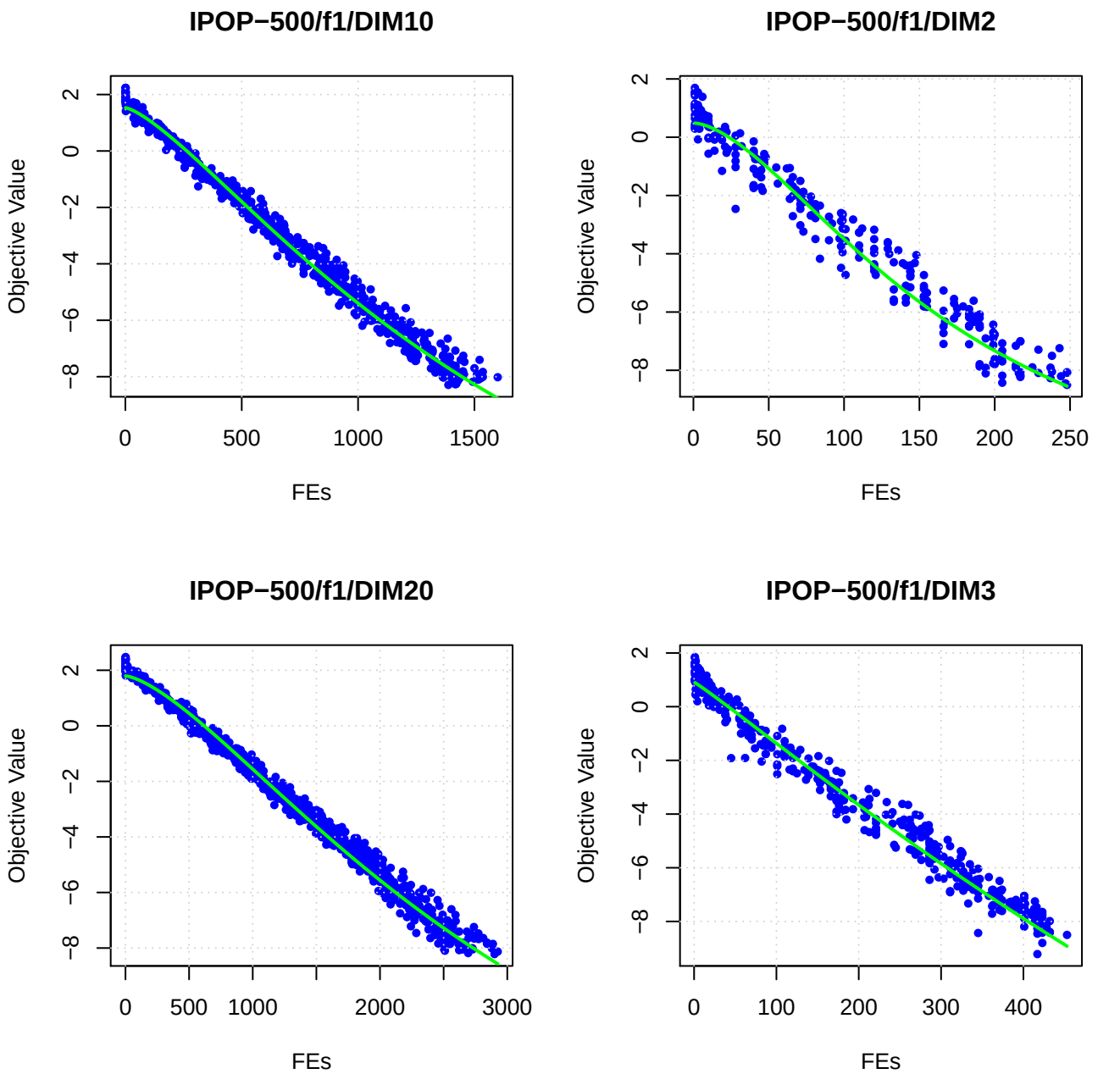
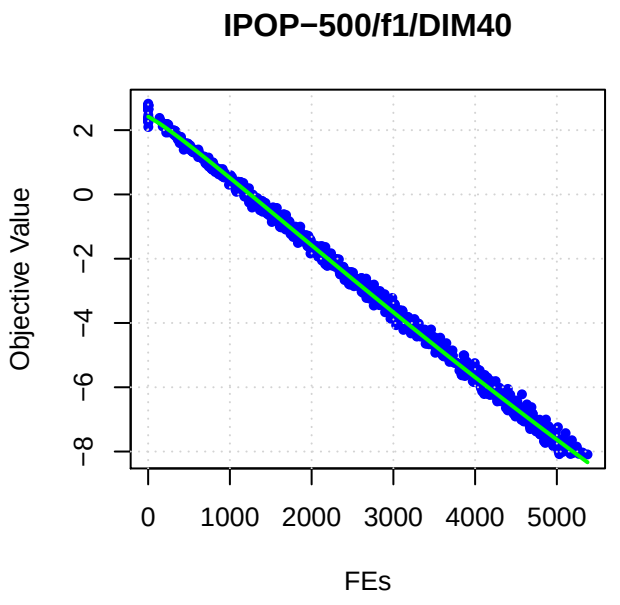

IPOP−500/f1/DIM10
Objective Value
FEs
IPOP−500/f1/DIM2
Objective Value
FEs
IPOP−500/f1/DIM20
Objective Value
FEs
IPOP−500/f1/DIM3
Objective Value
FEs


IPOP−500/f1/DIM40
Objective Value
FEs
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0
−2
−4
−6
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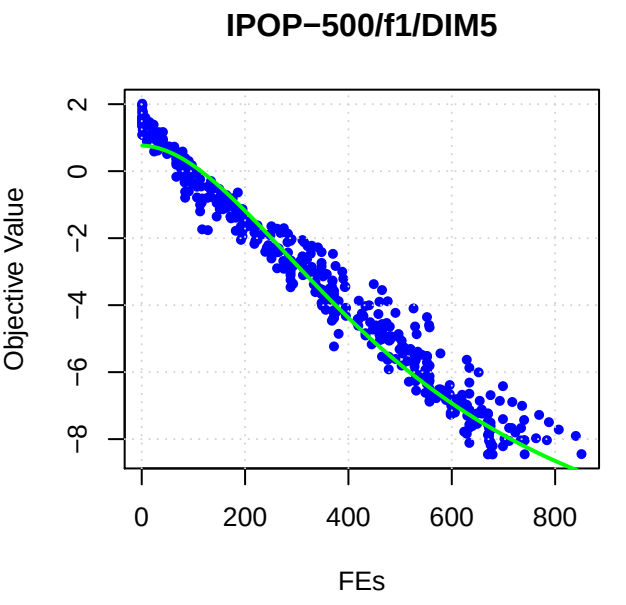
2000
3000
4000
5000


IPOP−500/f1/DIM5
Objective Value
FEs
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0
−2
−4
−6
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600
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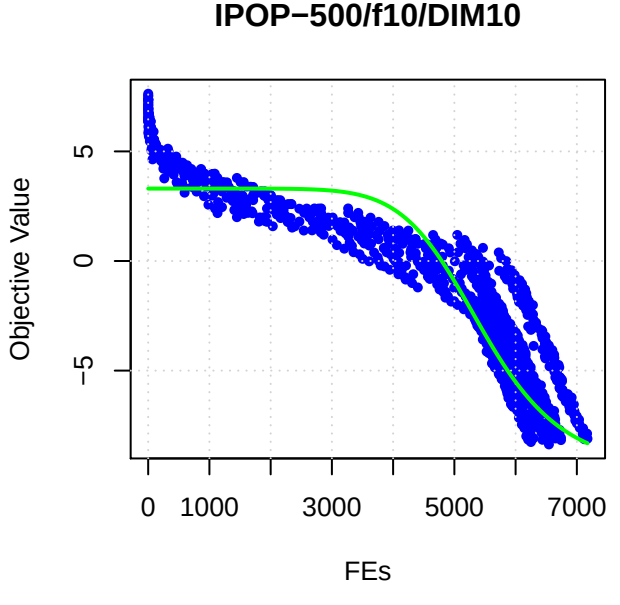
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Objective Value
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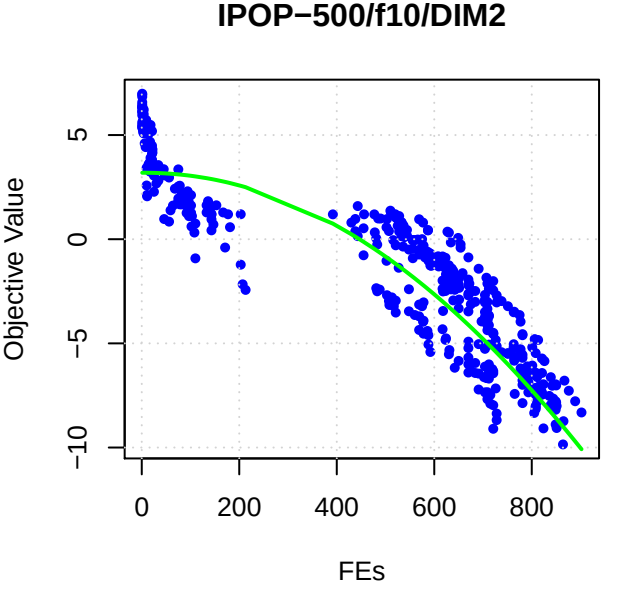
3000
5000
7000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Objective Value
FEs
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600
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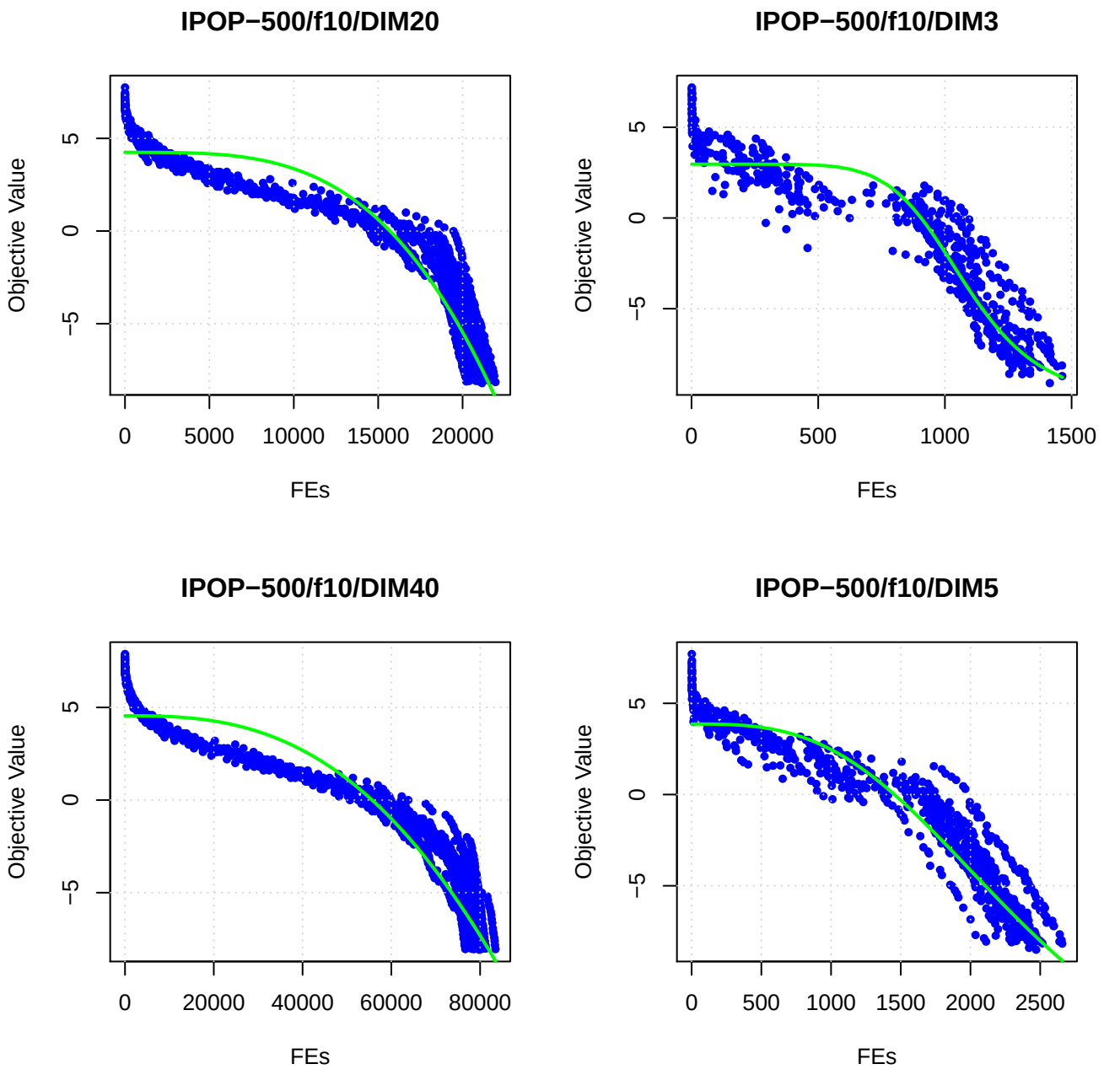
IPOP−500/f10/DIM20
Objective Value
FEs
IPOP−500/f10/DIM3
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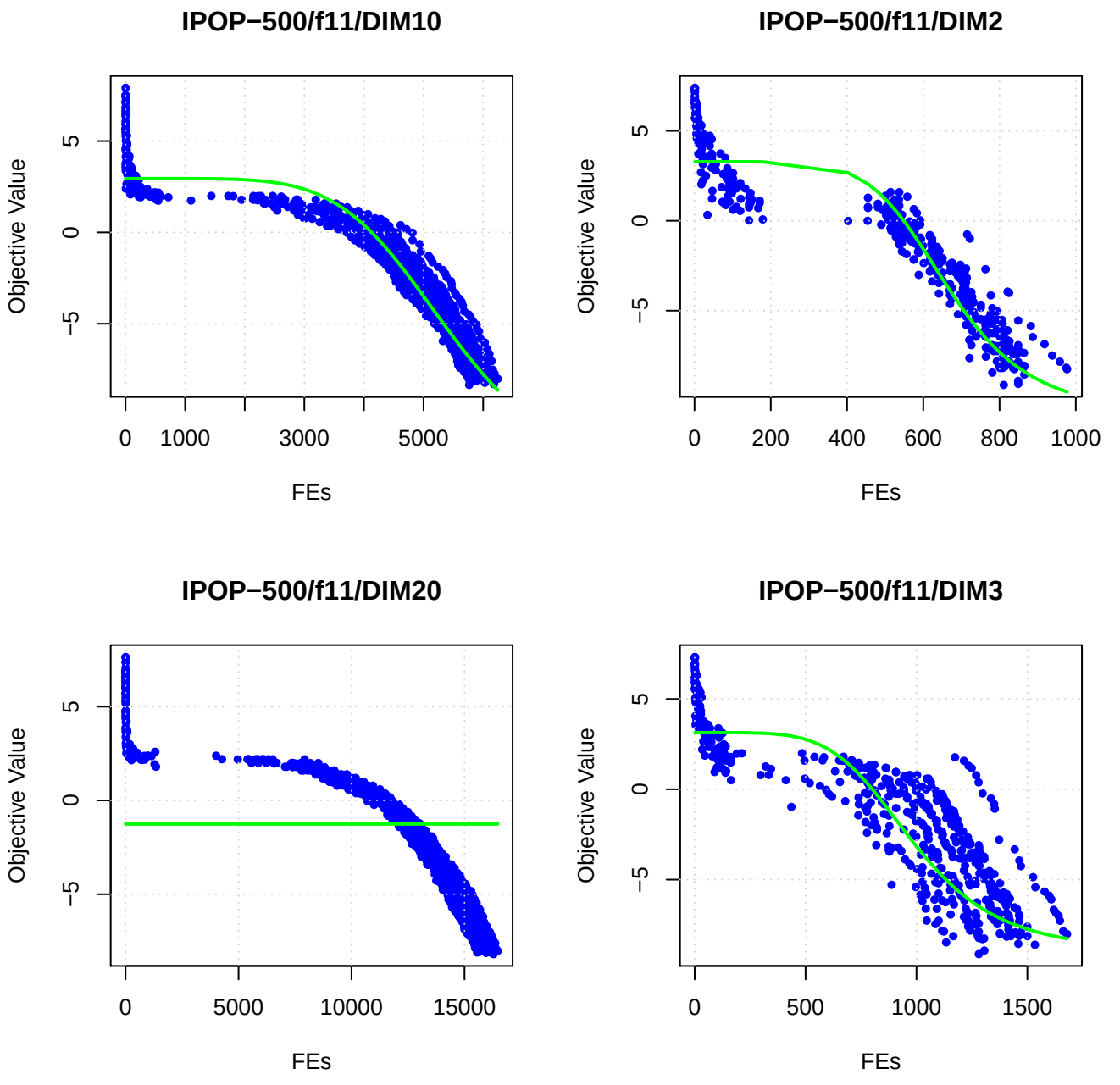
FEs
IPOP−500/f10/DIM40
Objective Value
FEs
IPOP−500/f10/DIM5
Objective Value
FEs


IPOP−500/f11/DIM10
Objective Value
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0
−5
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1000
3000
5000
FEs
IPOP−500/f11/DIM2
Objective Value
5
0
−5
0
200
400
600
800
1000
FEs
IPOP−500/f11/DIM20
Objective Value
5
0
−5
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FEs
IPOP−500/f11/DIM3
Objective Value
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0
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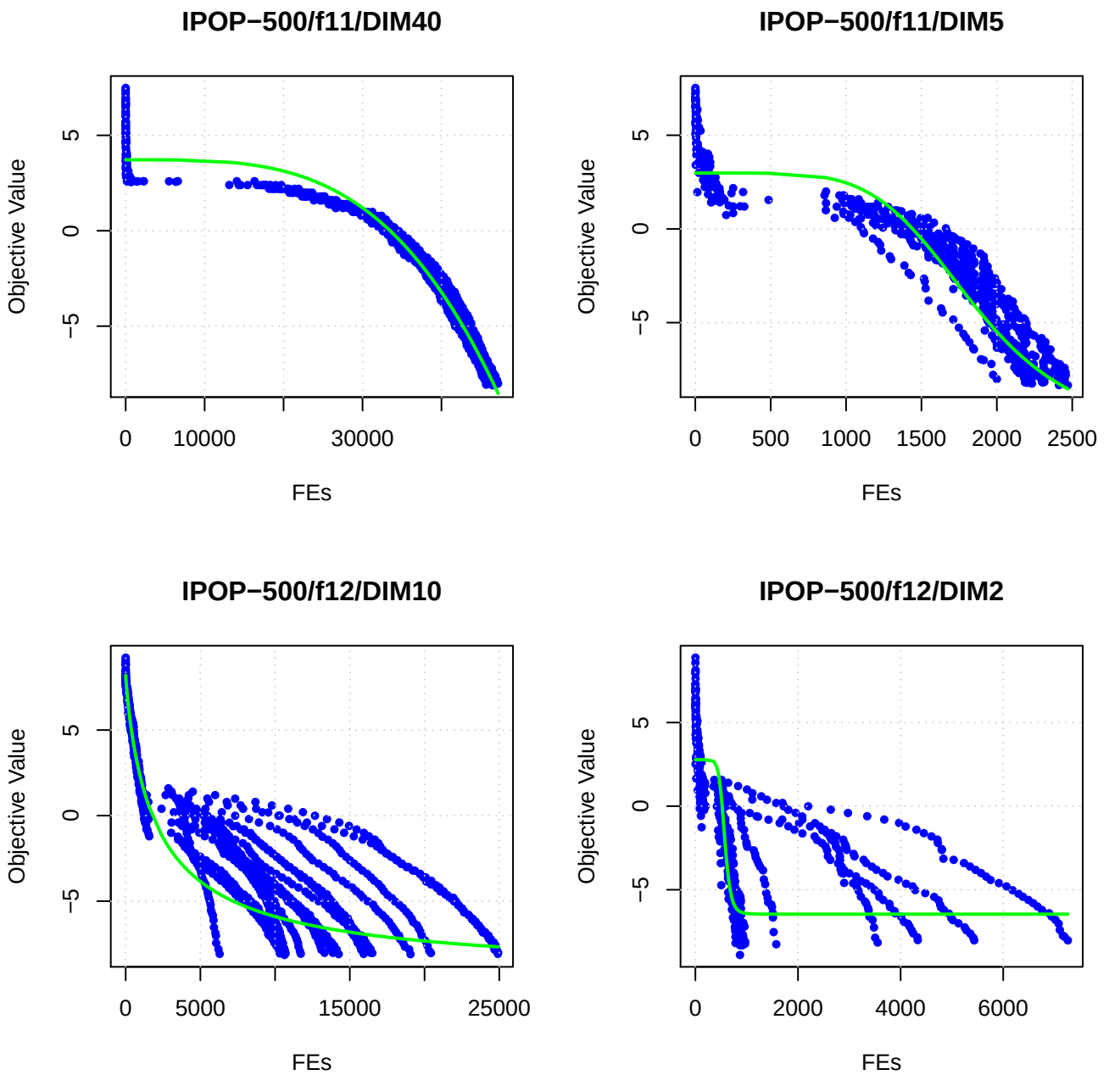
500
1000
1500
FEs


IPOP−500/f11/DIM40
Objective Value
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0
−5
0
10000
30000
FEs
IPOP−500/f11/DIM5
Objective Value
5
0
−5
0
500
1000
1500
2000
2500
FEs
IPOP−500/f12/DIM10
Objective Value
5
0
−5
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15000
25000
FEs
IPOP−500/f12/DIM2
Objective Value
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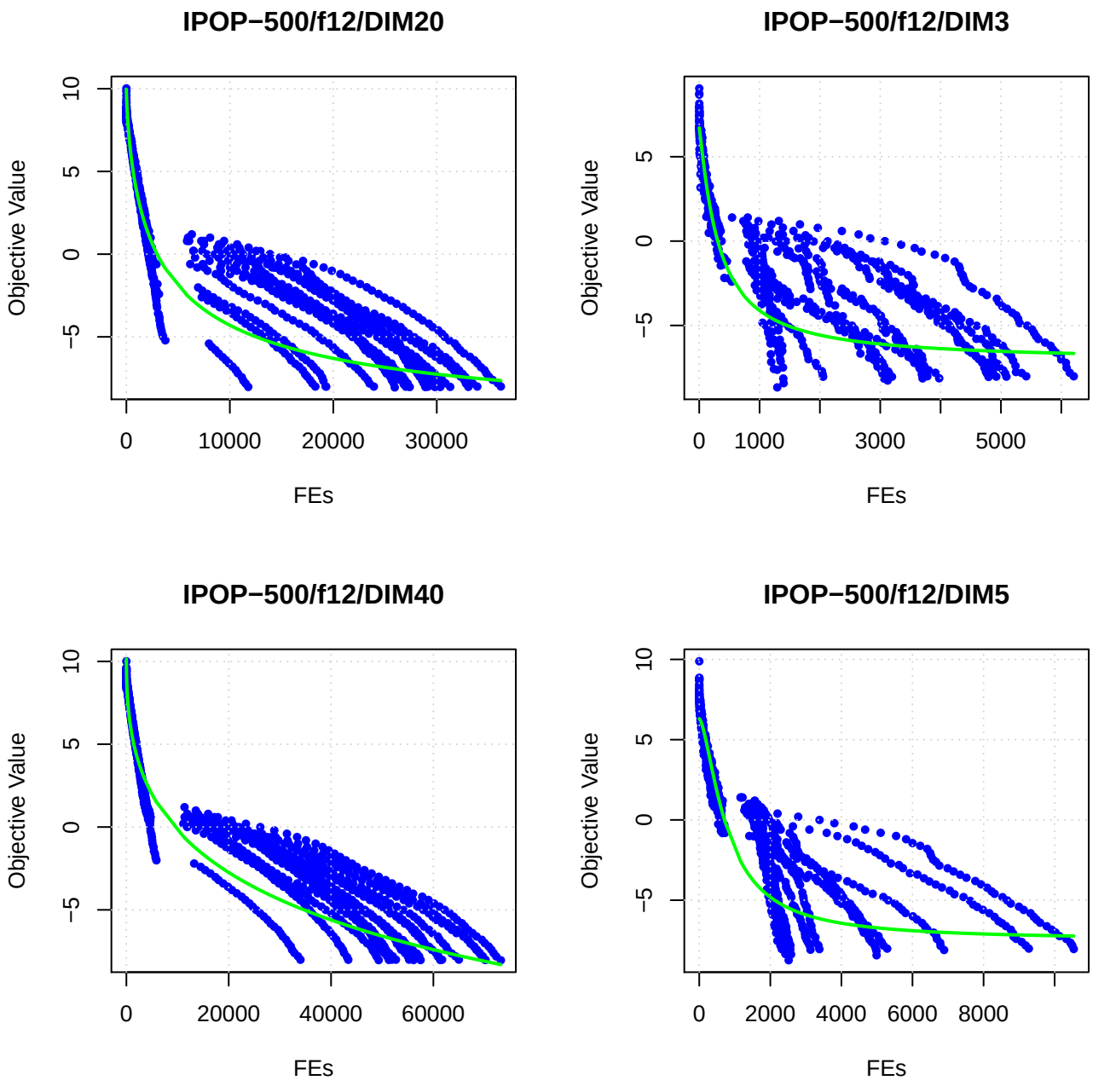
2000
4000
6000
FEs


IPOP−500/f12/DIM20
Objective Value
FEs
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10000
20000
30000
10
5
0
−5
IPOP−500/f12/DIM3
Objective Value
FEs
0
1000
3000
5000
5
0
−5
IPOP−500/f12/DIM40
Objective Value
FEs
0
20000
40000
60000
10
5
0
−5
IPOP−500/f12/DIM5
Objective Value
FEs
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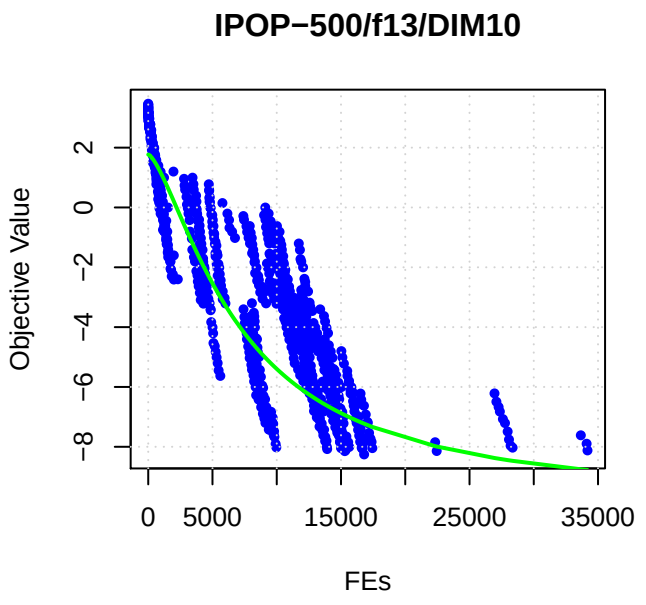
2000
4000
6000
8000
10
5
0
−5


IPOP−500/f13/DIM10
Objective Value
FEs
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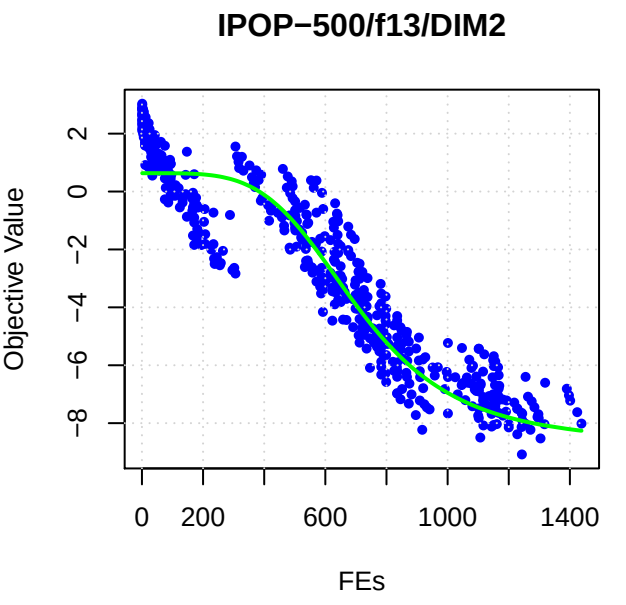
−2
−4
−6
−8
0
5000
15000
25000
35000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Objective Value
FEs
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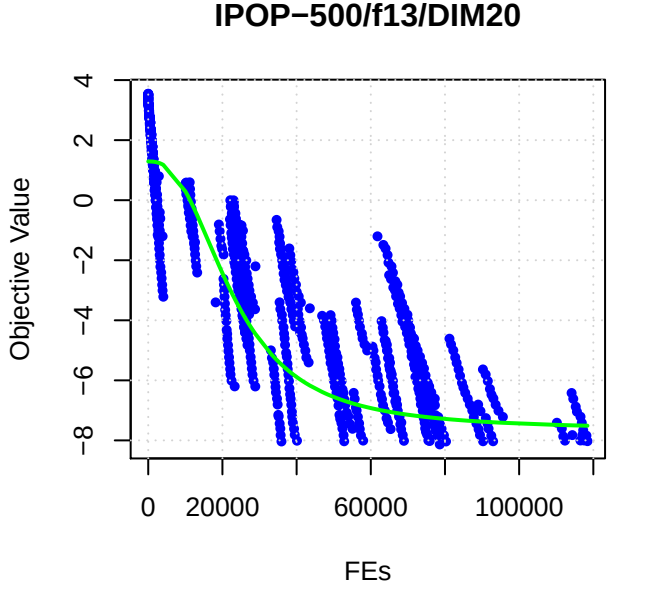
IPOP−500/f13/DIM20
Objective Value
FEs
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−4
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−8
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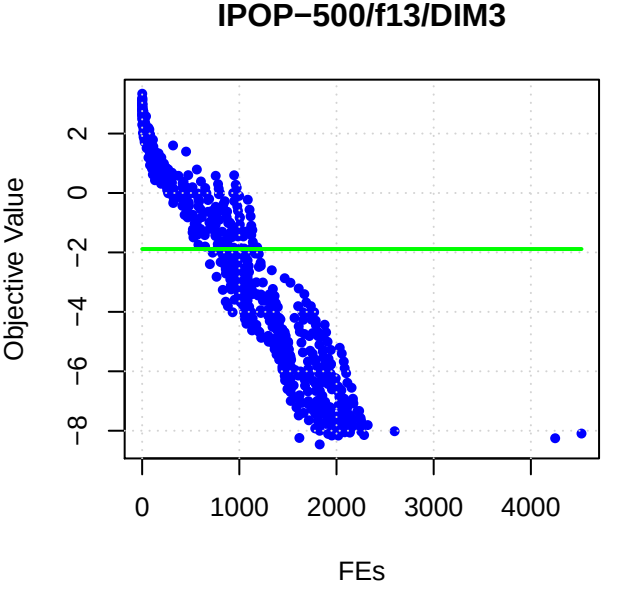
20000
60000
100000


IPOP−500/f13/DIM3
Objective Value
FEs
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−2
−4
−6
−8
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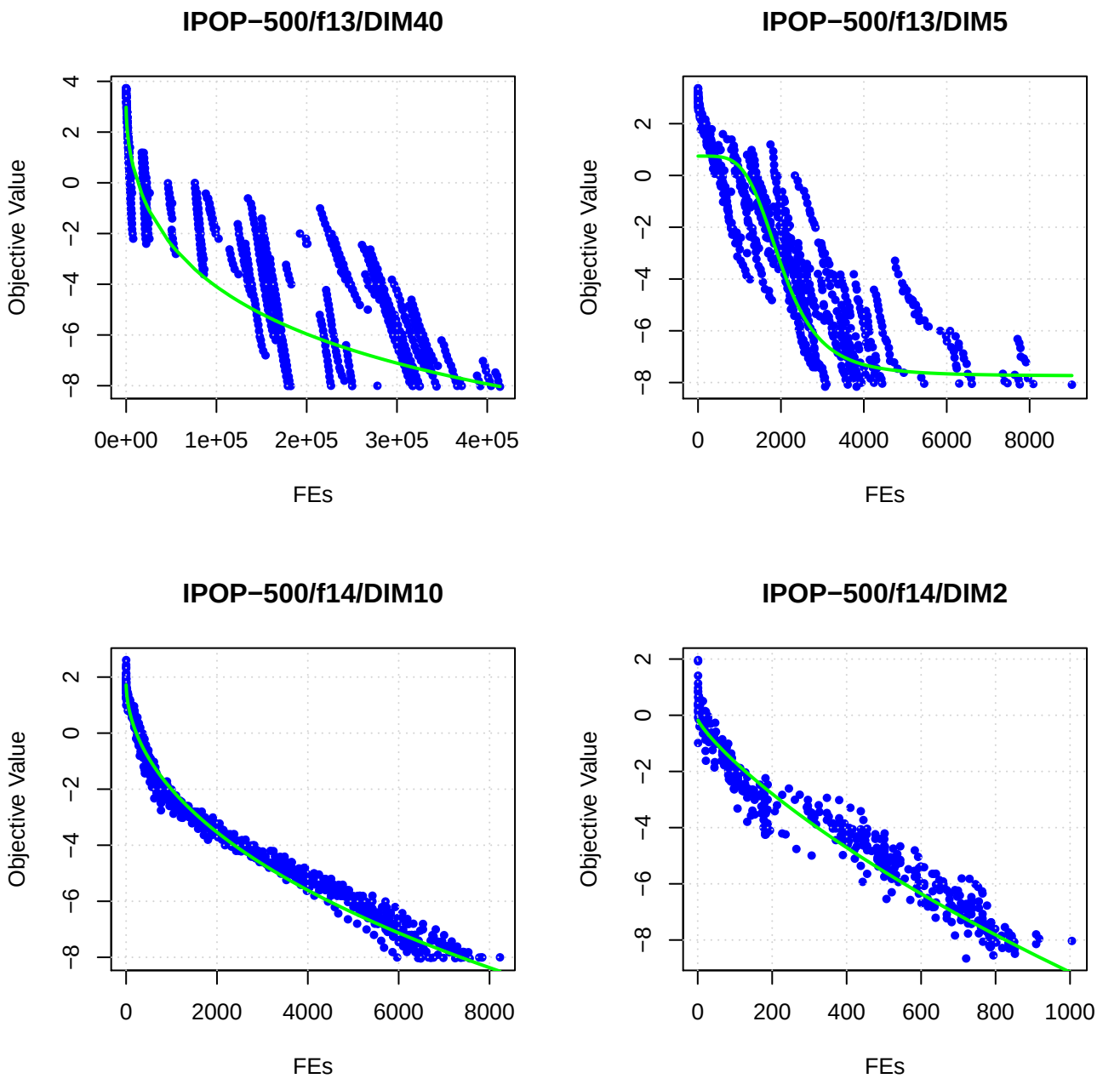
1000
2000
3000
4000


IPOP−500/f13/DIM40
Objective Value
FEs
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1e+05
2e+05
3e+05
4e+05
IPOP−500/f13/DIM5
Objective Value
FEs
0
2000
4000
6000
8000
IPOP−500/f14/DIM10
Objective Value
FEs
0
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4000
6000
8000
IPOP−500/f14/DIM2
Objective Value
FEs
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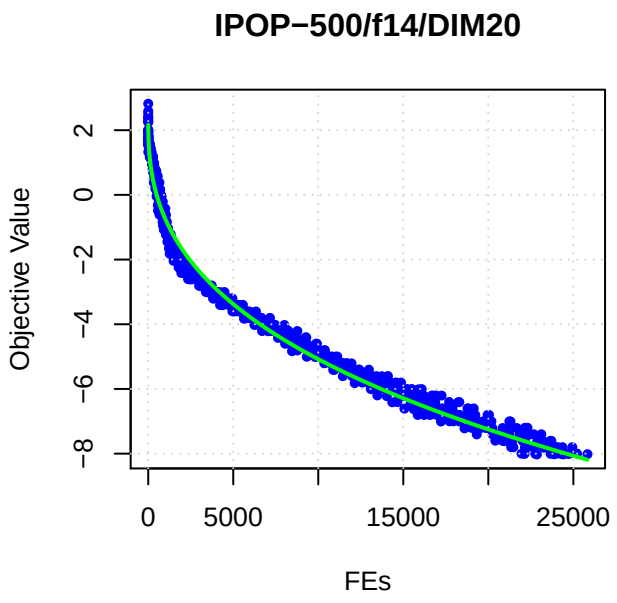
400
600
800
1000


IPOP−500/f14/DIM20
Objective Value
FEs
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−2
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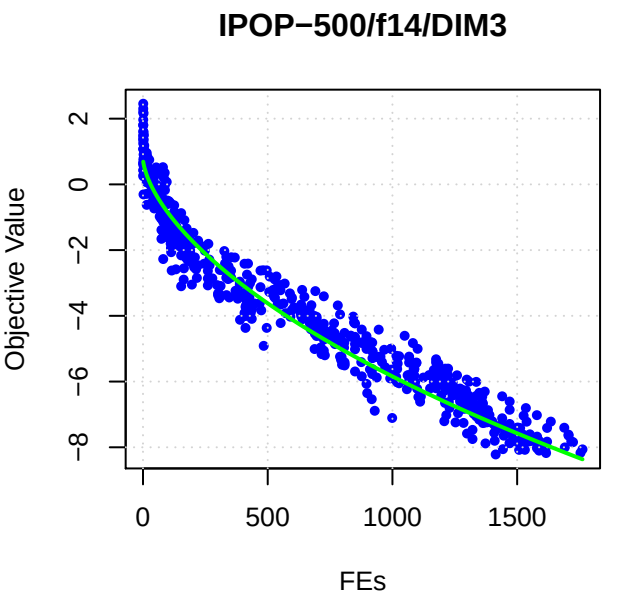
15000
25000


IPOP−500/f14/DIM3
Objective Value
FEs
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−6
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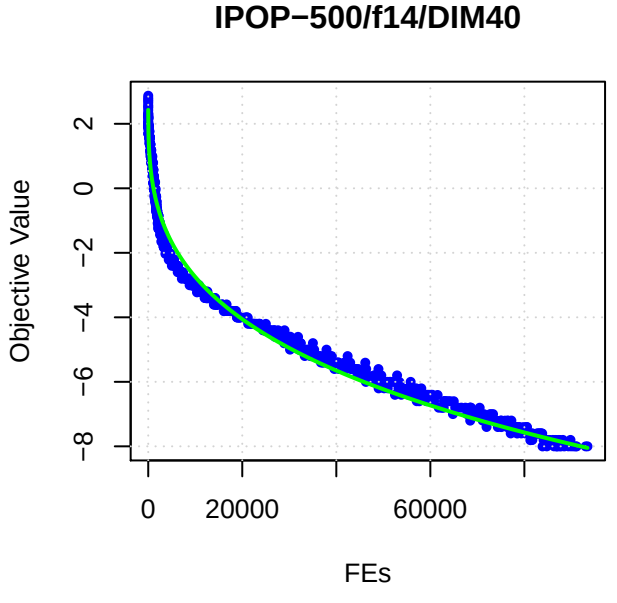
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Objective Value
FEs
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−4
−6
−8
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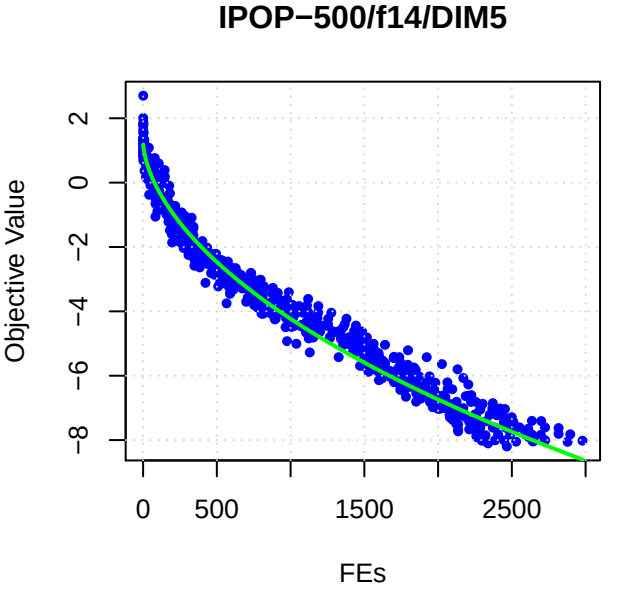
20000
60000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Objective Value
FEs
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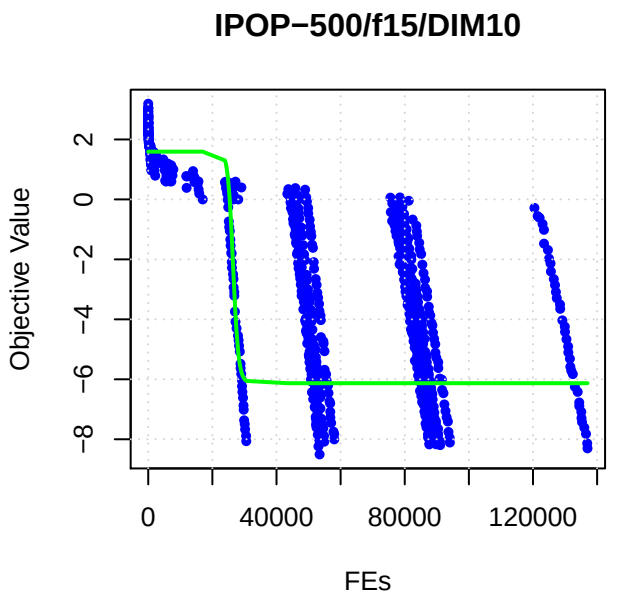
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Objective Value
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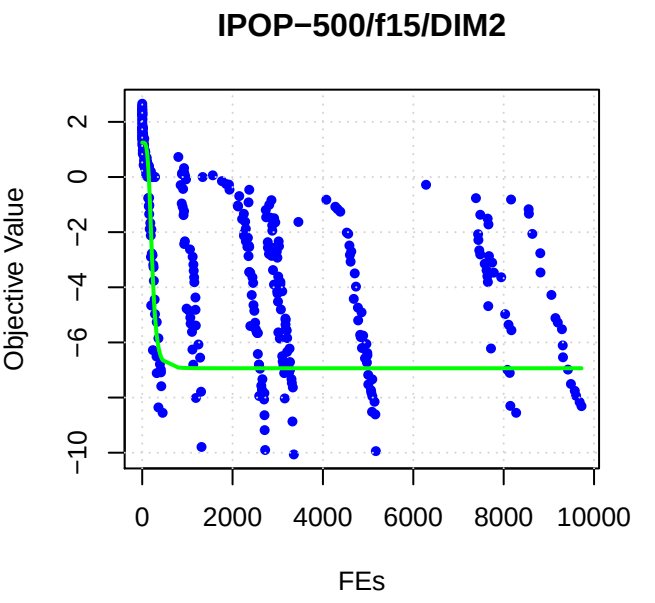
120000
FEs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Objective Value
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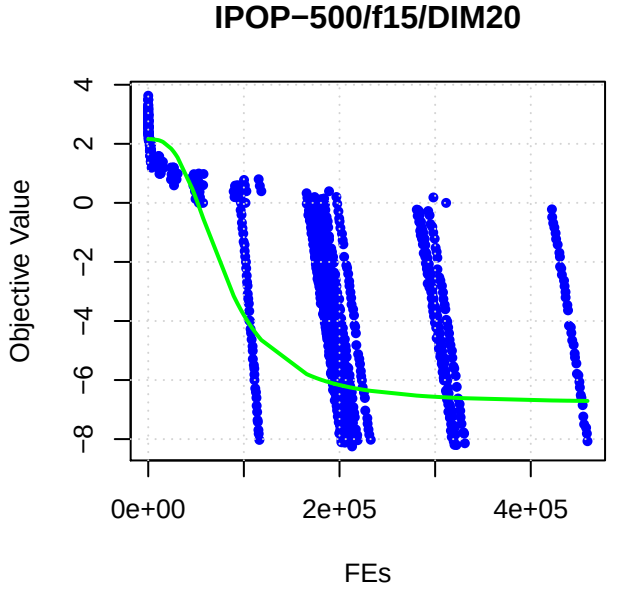
4000
6000
8000
10000
FEs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Objective Value
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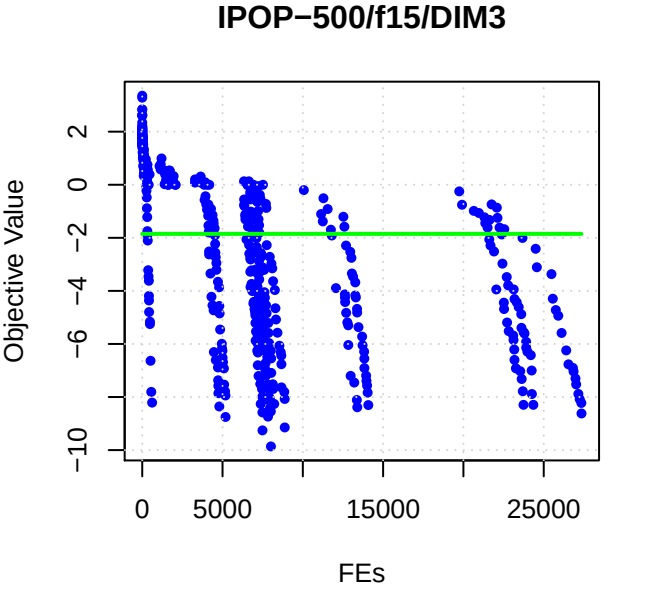
4e+05
FEs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Objective Value
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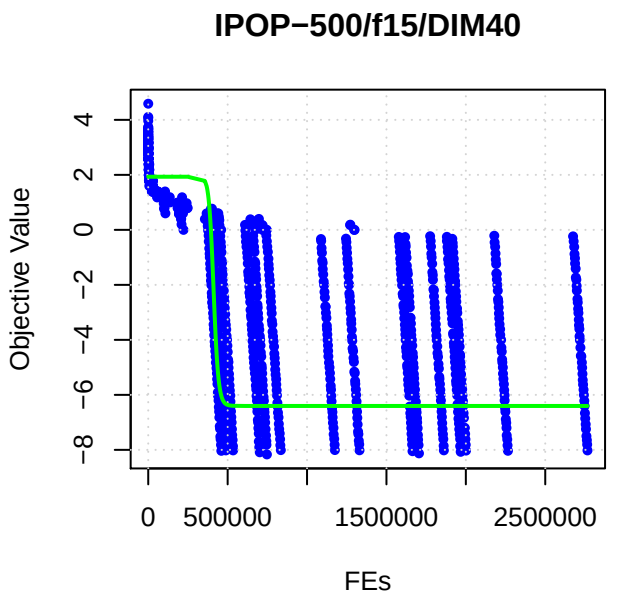
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Objective Value
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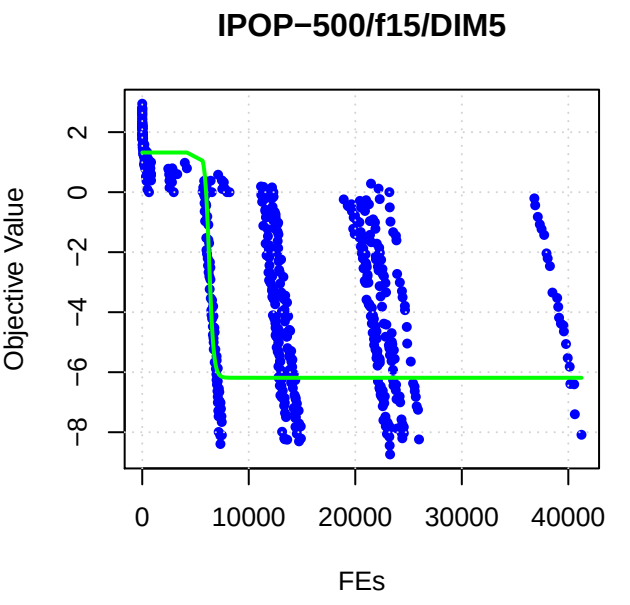
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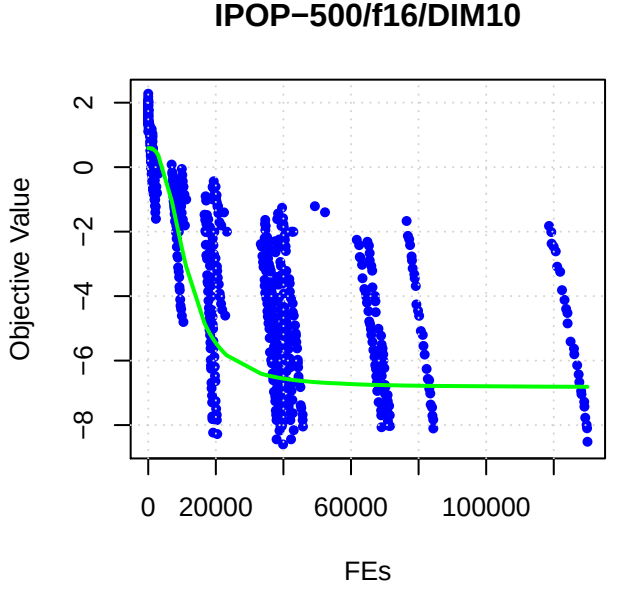
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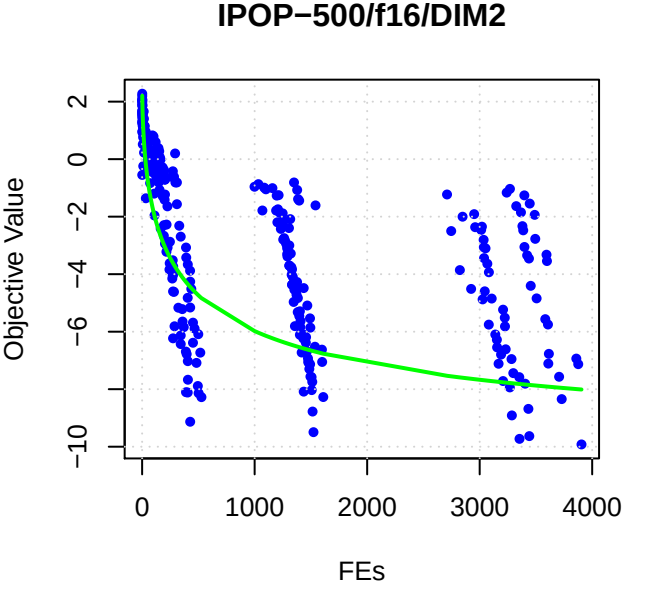
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Objective Value
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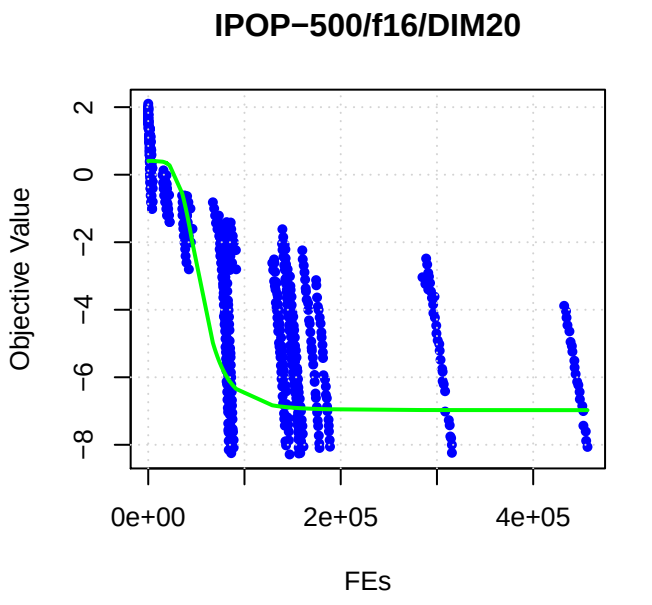
IPOP−500/f16/DIM20
Objective Value
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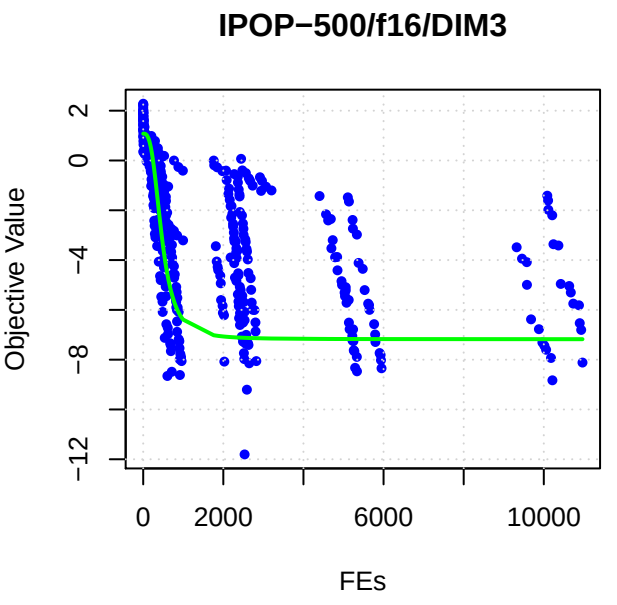
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Objective Value
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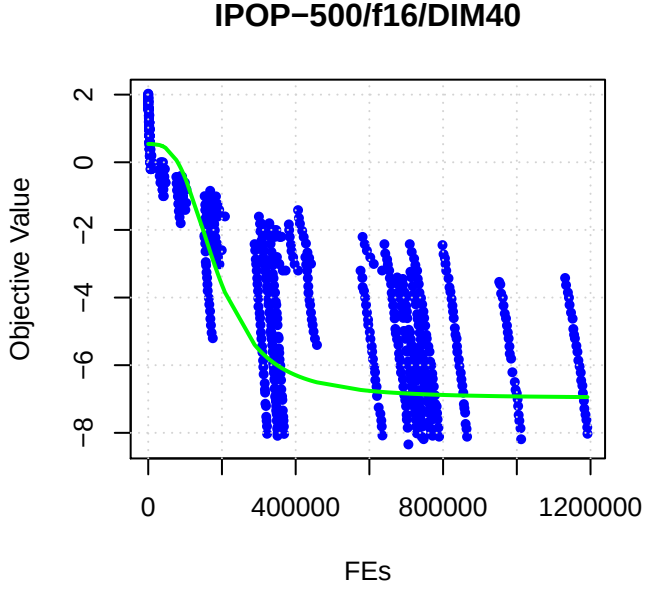
10000
FEs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Objective Value
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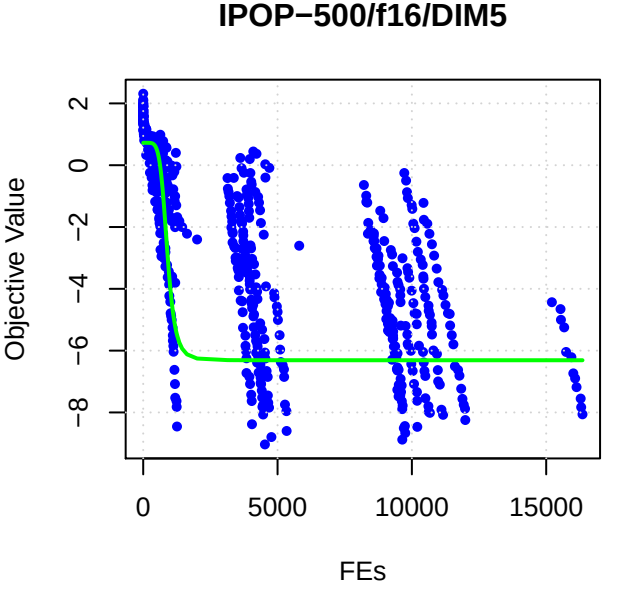
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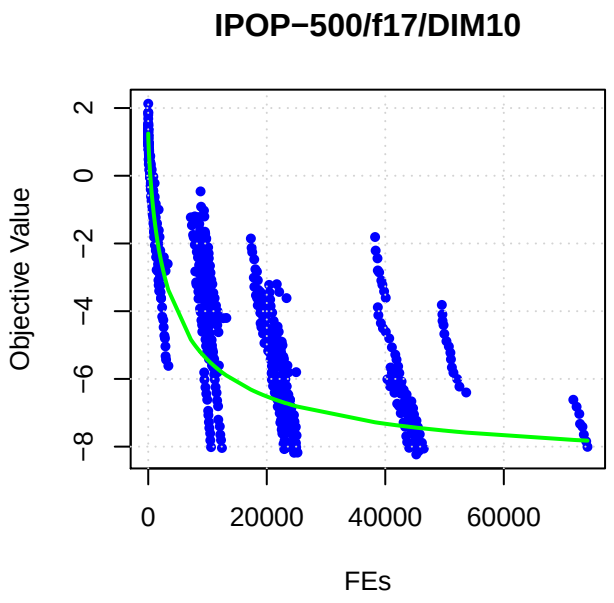
FEs


IPOP−500/f17/DIM10
Objective Value
FEs
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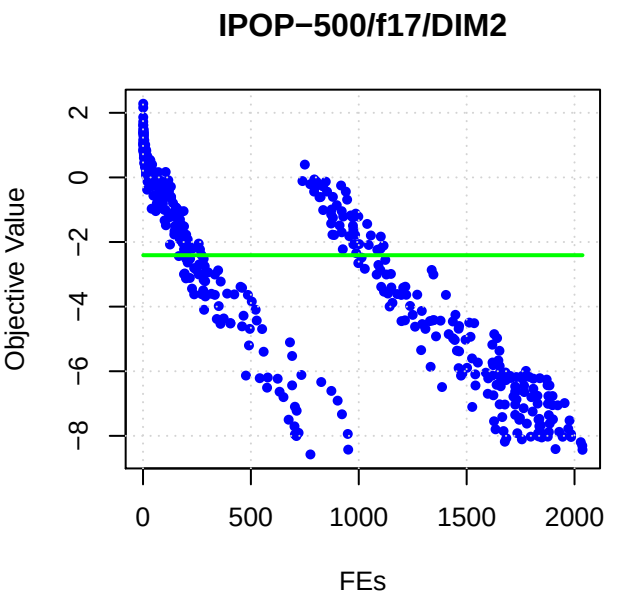
IPOP−500/f17/DIM2
Objective Value
FEs
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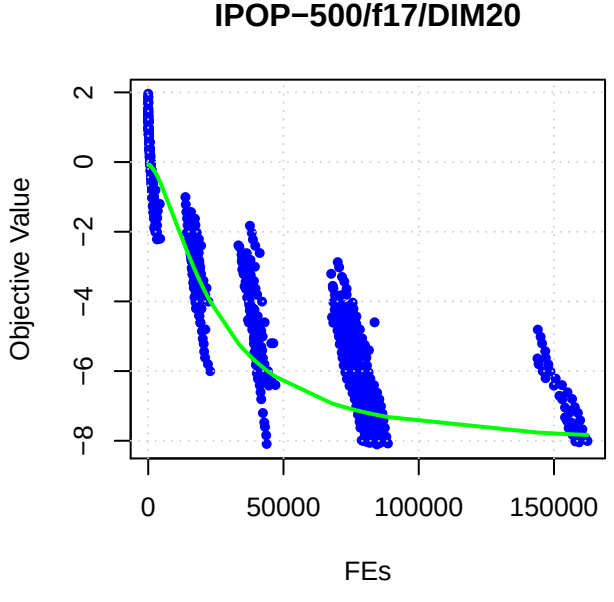
1000
1500
2000


IPOP−500/f17/DIM20
Objective Value
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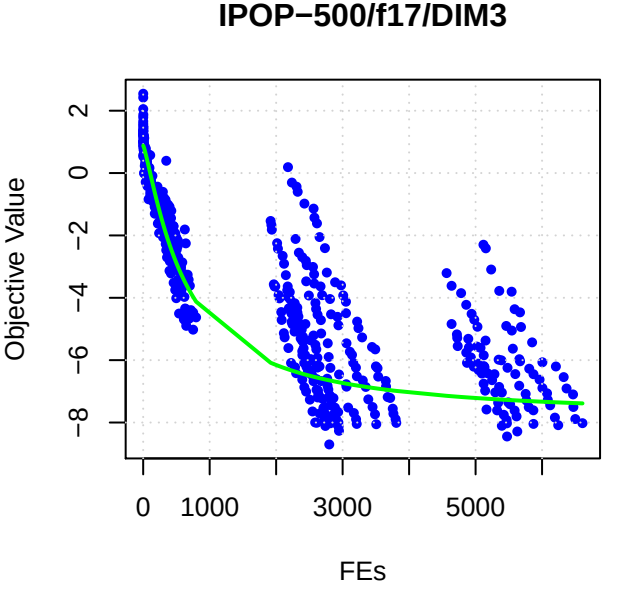
100000
150000


IPOP−500/f17/DIM3
Objective Value
FEs
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−6
−8
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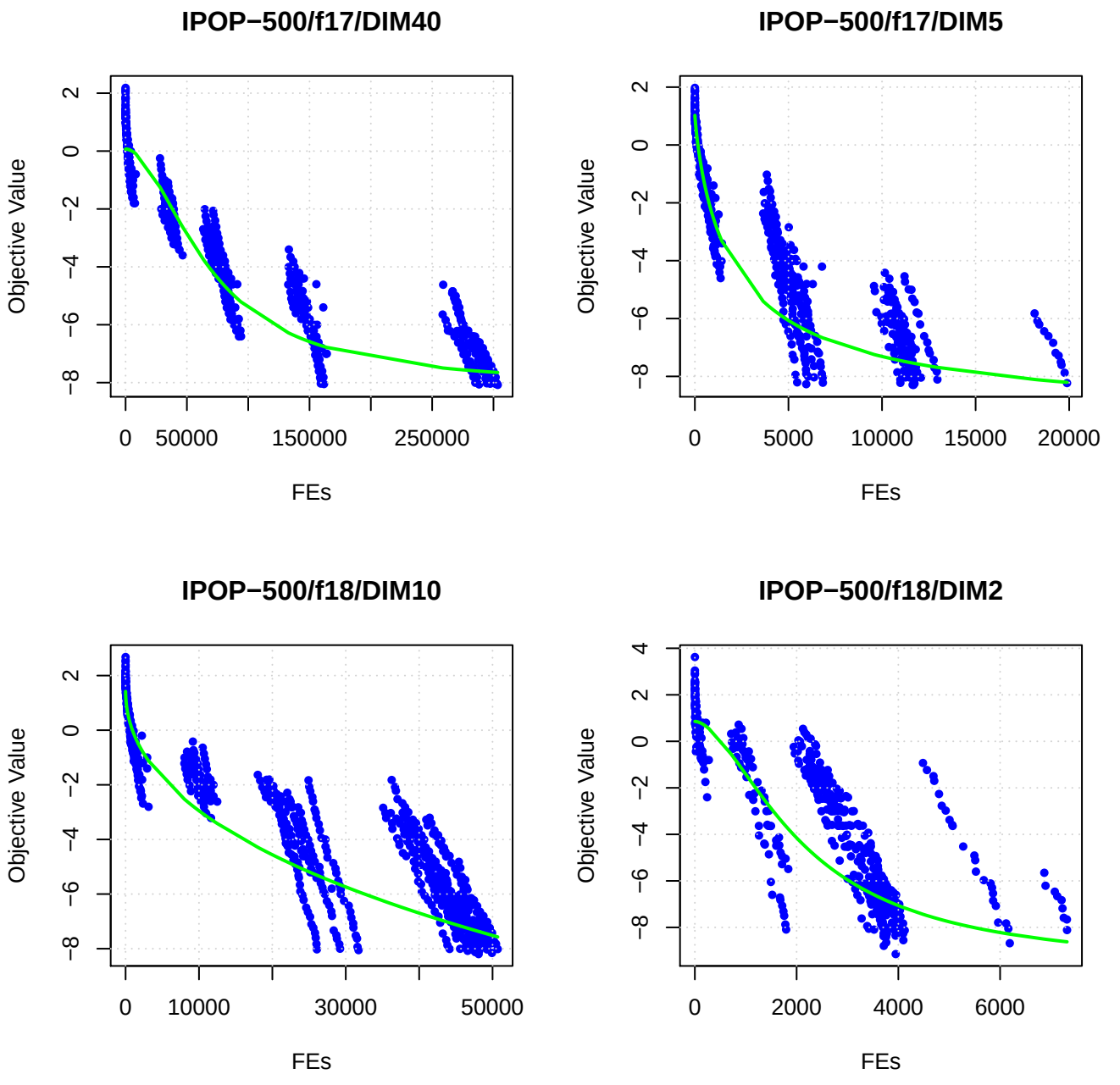
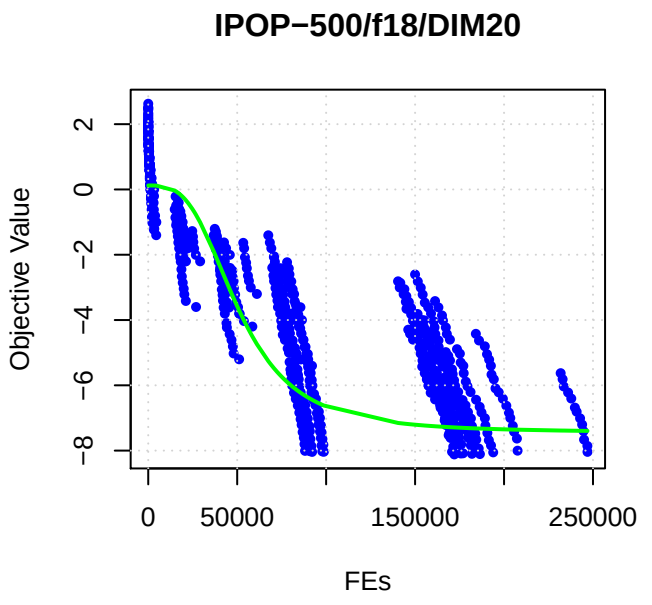
1000
3000
5000


IPOP−500/f17/DIM40
Objective Value
FEs
IPOP−500/f17/DIM5
Objective Value
FEs
IPOP−500/f18/DIM10
Objective Value
FEs
IPOP−500/f18/DIM2
Objective Value
FEs


IPOP−500/f18/DIM20
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150000
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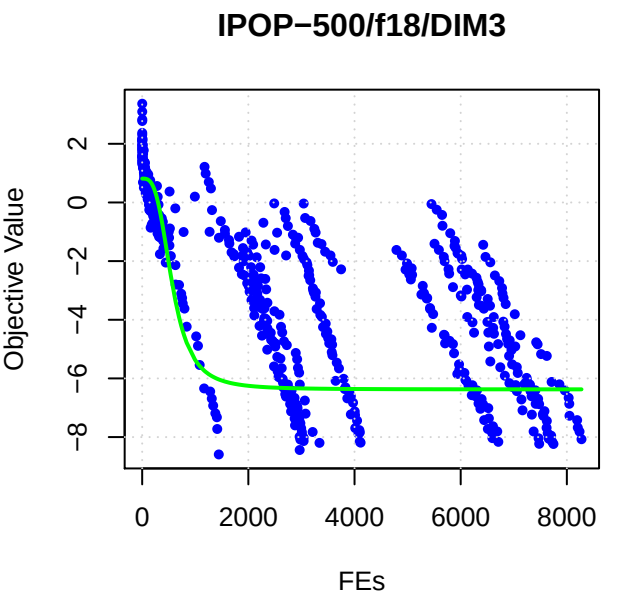
FEs


IPOP−500/f18/DIM3
Objective Value
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−4
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−8
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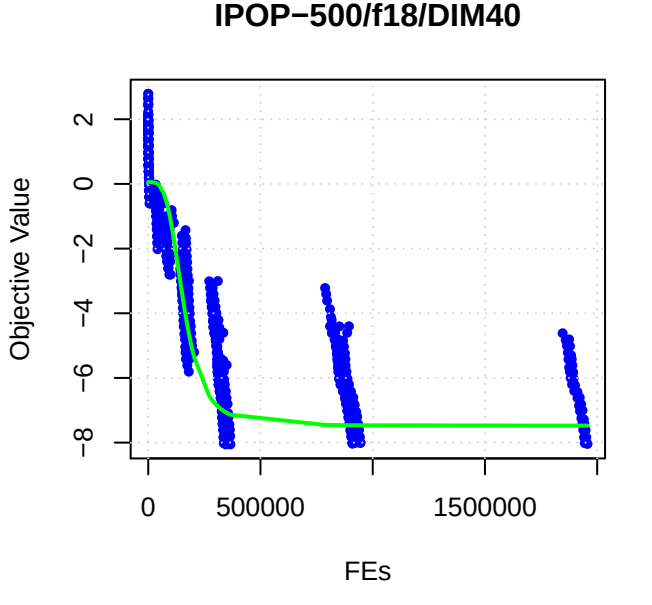
2000
4000
6000
8000
FEs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Objective Value
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−2
−4
−6
−8
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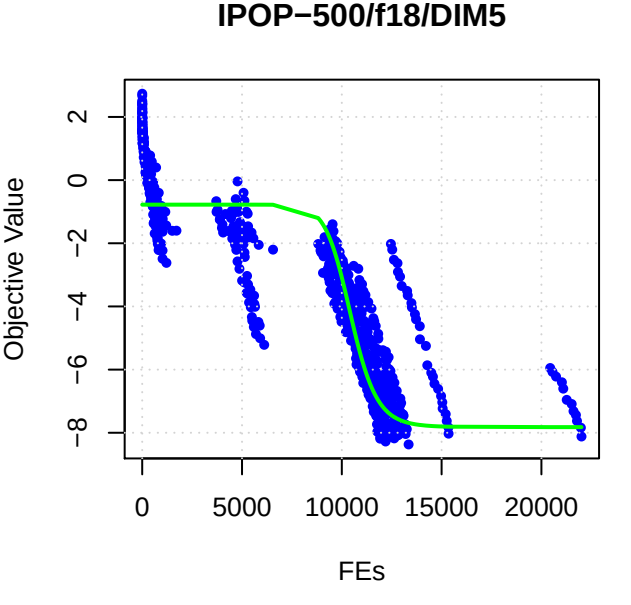
500000
1500000
FEs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−6
−8
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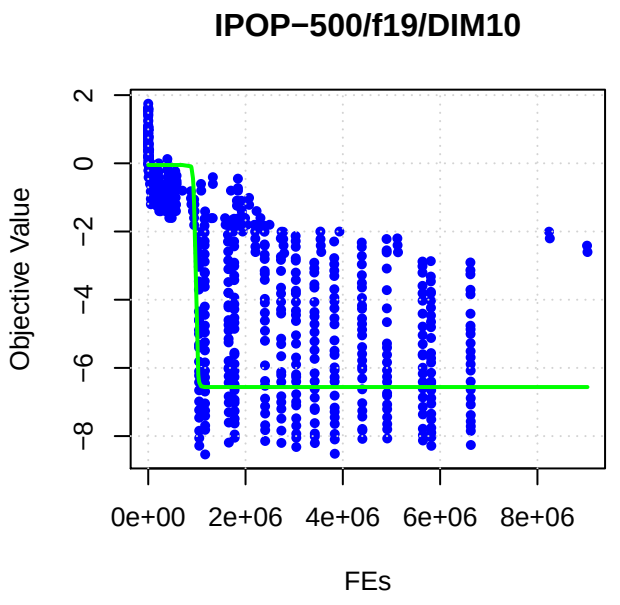
10000
15000
20000
FEs


IPOP−500/f19/DIM10
Objective Value
FEs
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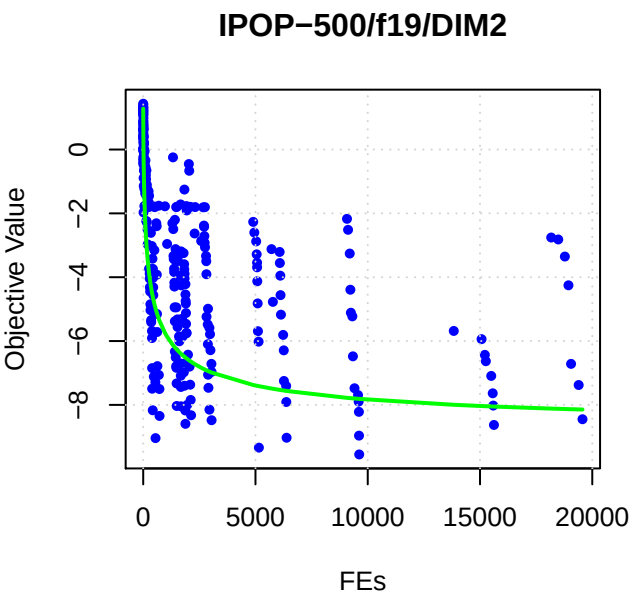
−2
−4
−6
−8
0e+00
2e+06
4e+06
6e+06
8e+06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Objective Value
FEs
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−2
−4
−6
−8
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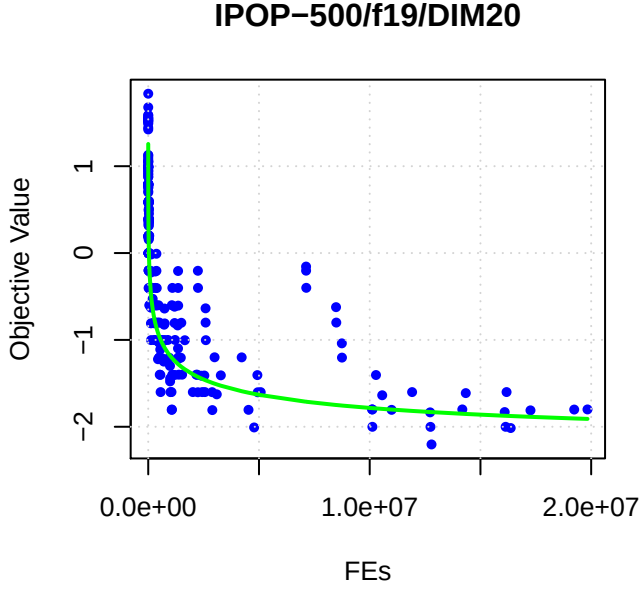
5000
10000
15000
20000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Objective Value
FEs
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−1
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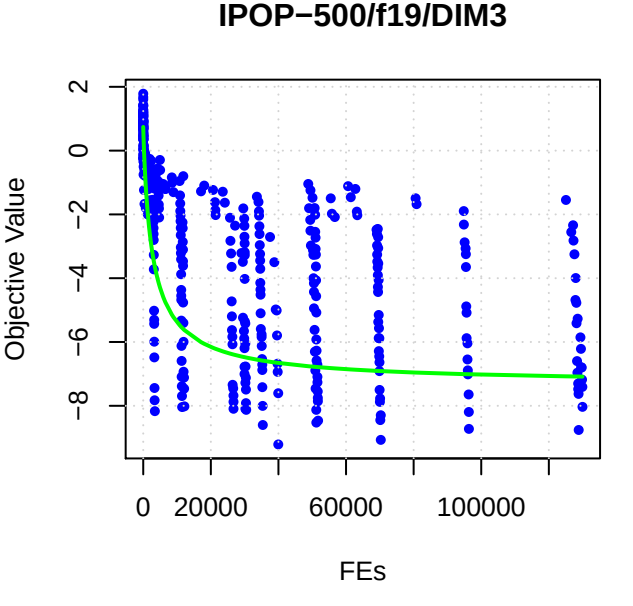
1.0e+07
2.0e+07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Objective Value
FEs
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0
−2
−4
−6
−8
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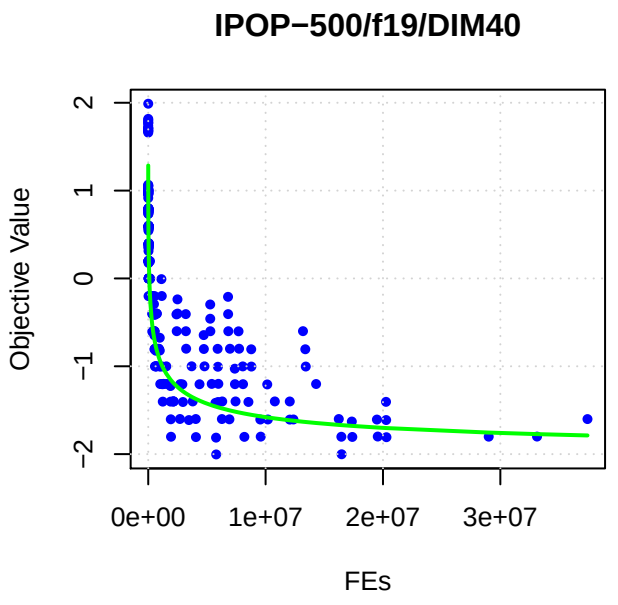
20000
60000
100000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Objective Value
FEs
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0
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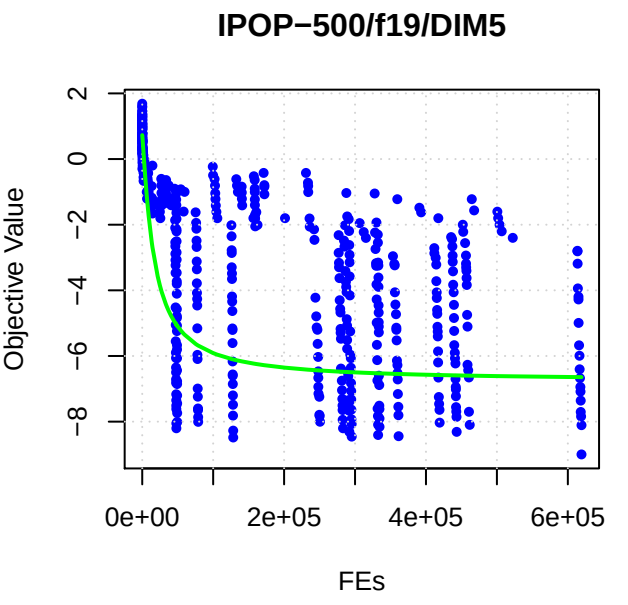
2e+07
3e+07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Objective Value
FEs
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−2
−4
−6
−8
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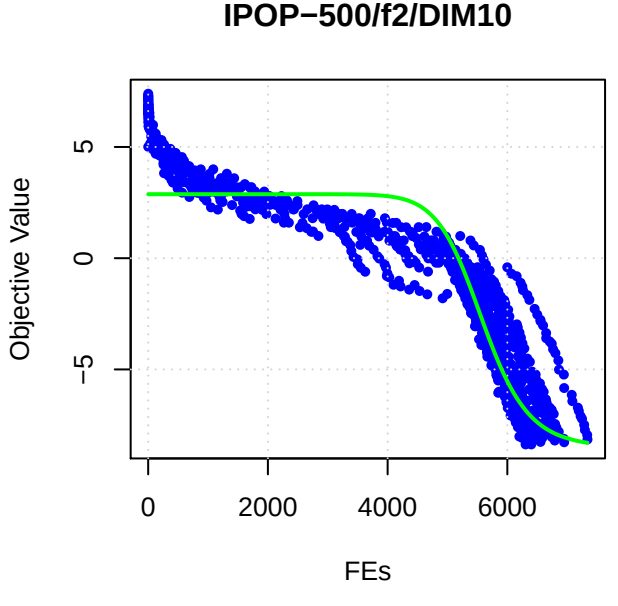
4e+05
6e+05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Objective Value
FEs
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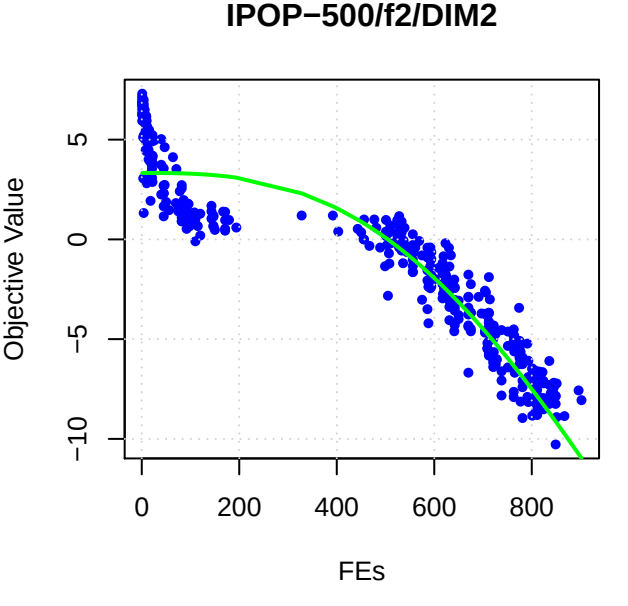
0
2000
4000
6000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Objective Value
FEs
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−5
−10
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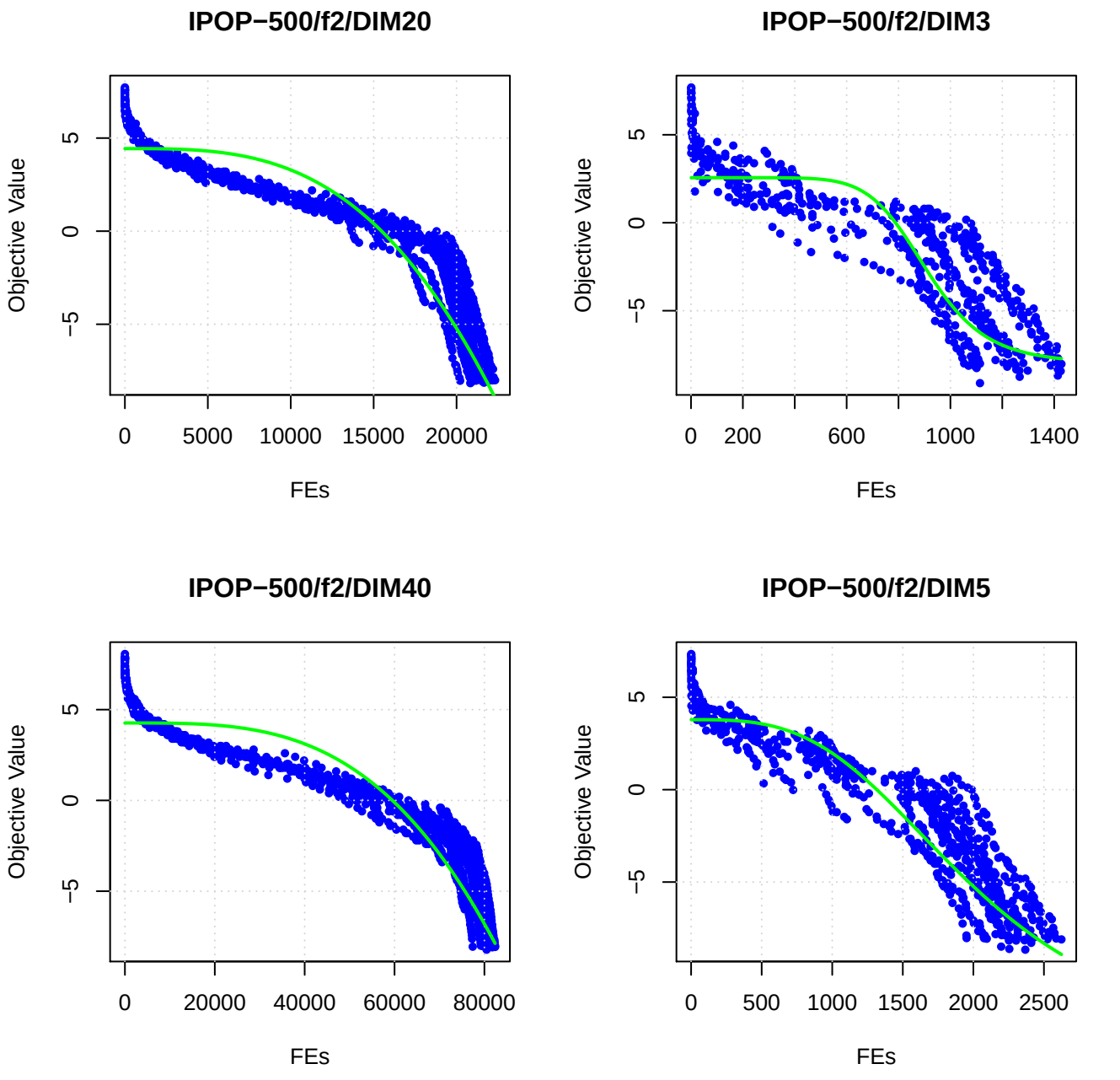
200
400
600
800


IPOP−500/f2/DIM20
Objective Value
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−5
0
5000
10000
15000
20000
FEs
IPOP−500/f2/DIM3
Objective Value
5
0
−5
0
200
600
1000
1400
FEs
IPOP−500/f2/DIM40
Objective Value
5
0
−5
0
20000
40000
60000
80000
FEs
IPOP−500/f2/DIM5
Objective Value
5
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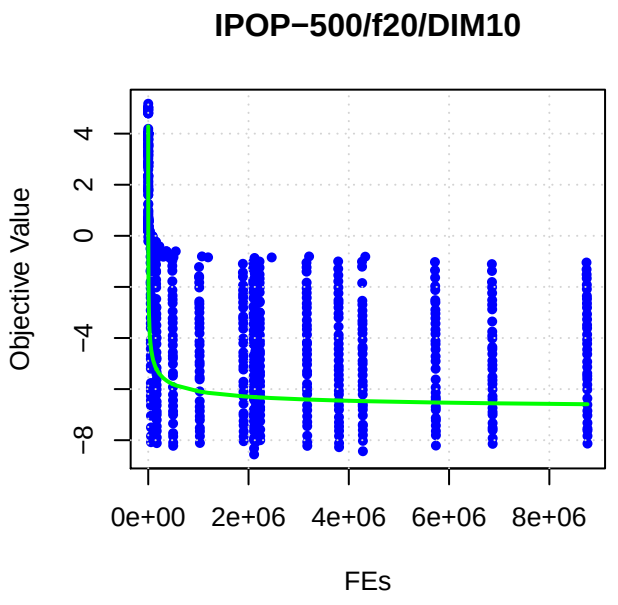
−5
0
500
1000
1500
2000
2500
FEs


IPOP−500/f20/DIM10
Objective Value
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0
−4
−8
0e+00
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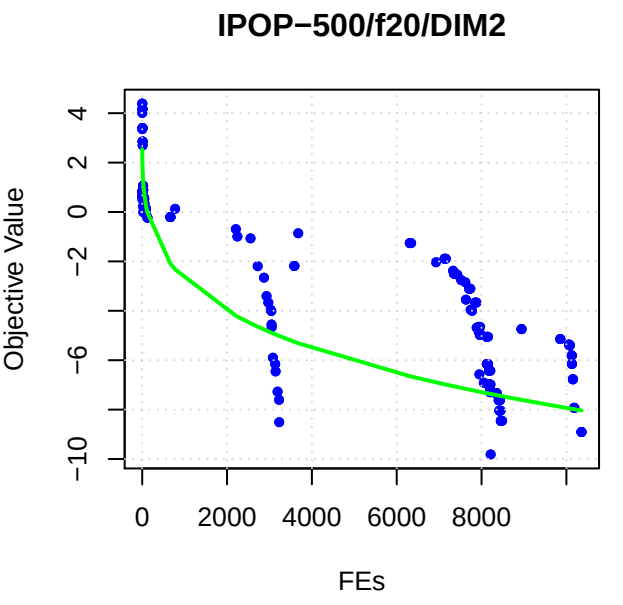
4e+06
6e+06
8e+06
FEs


IPOP−500/f20/DIM2
Objective Value
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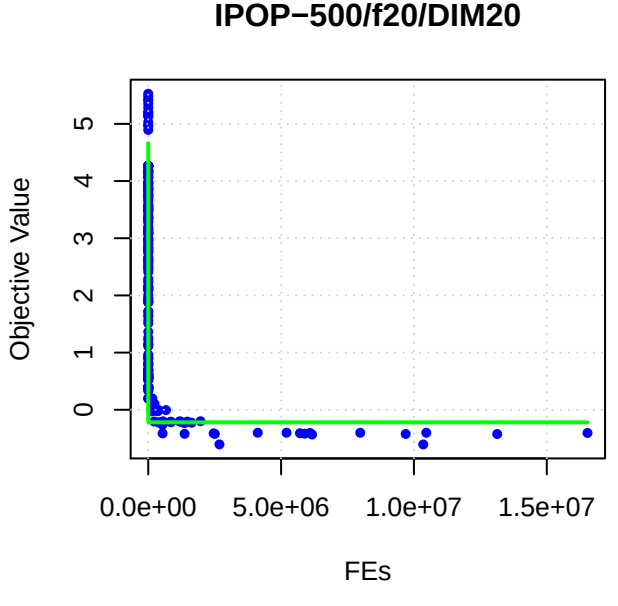
2
0
−2
−6
−10
0
2000
4000
6000
8000
FEs


IPOP−500/f20/DIM20
Objective Value
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3
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1
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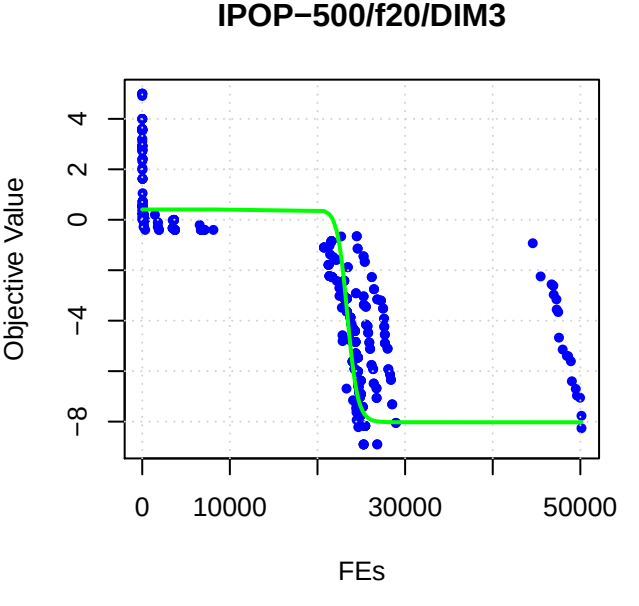
1.5e+07
FEs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Objective Value
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2
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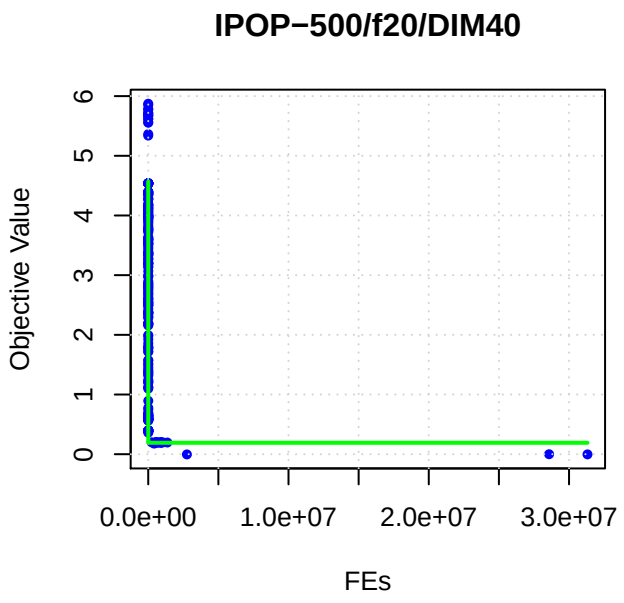
−4
−8
0
10000
30000
50000
FEs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Objective Value
FEs
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1.0e+07
2.0e+07
3.0e+07
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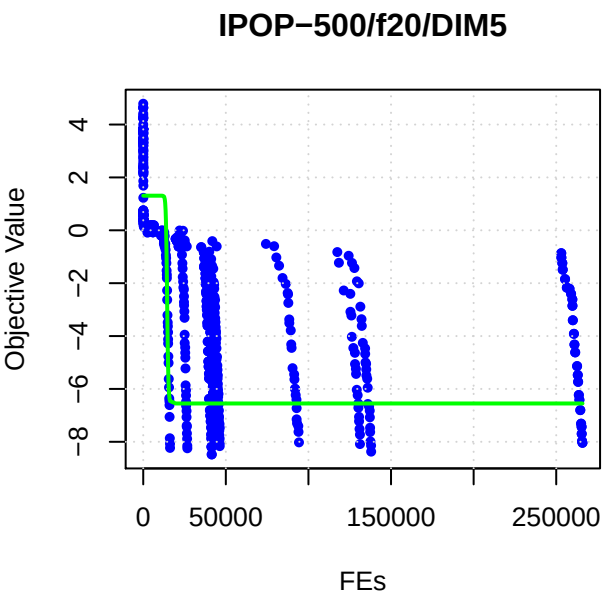
2
3
4
5
6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Objective Value
FEs
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150000
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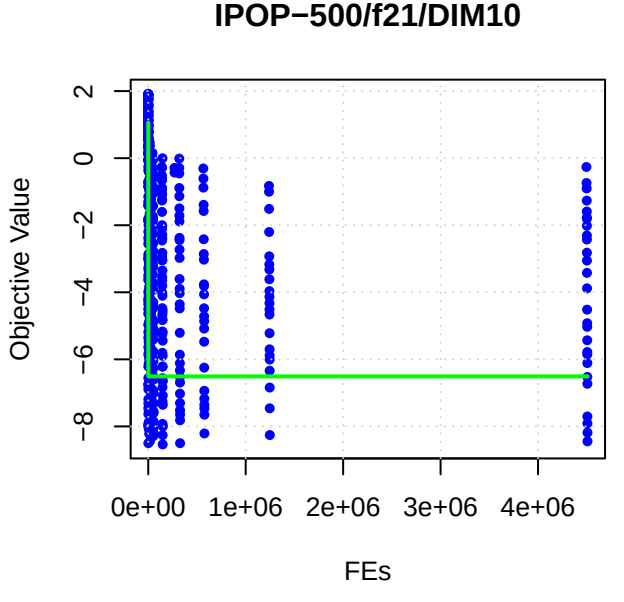
2
4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Objective Value
FEs
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3e+06
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−8
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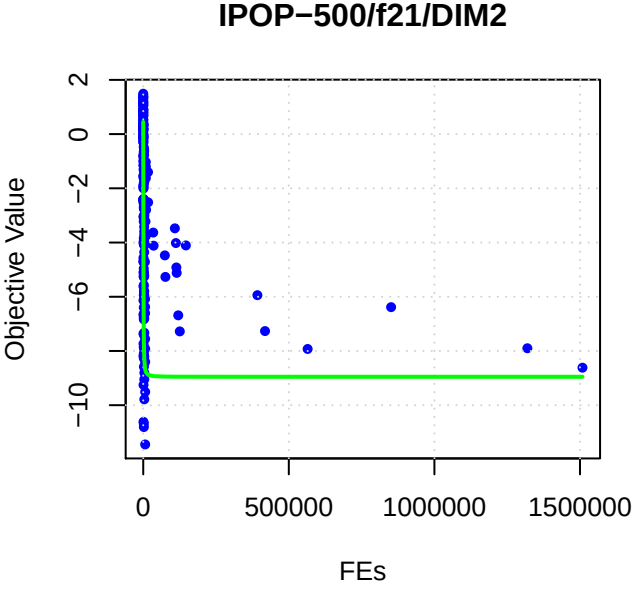
−4
−2
0
2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Objective Value
FEs
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1500000
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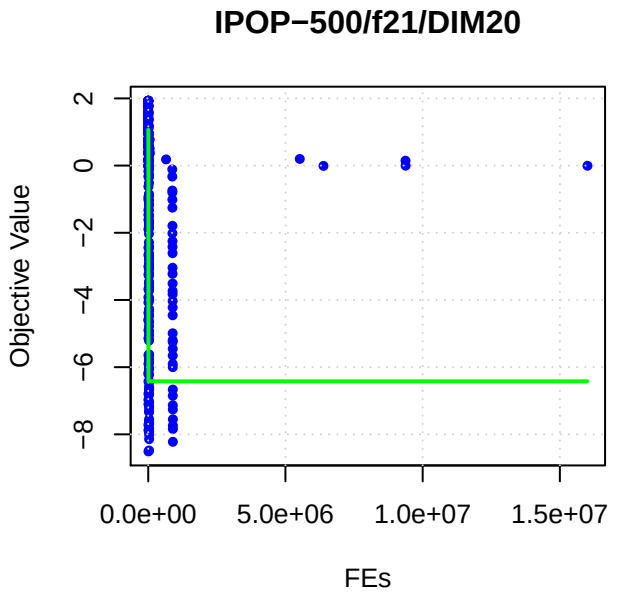
−4
−2
0
2


IPOP−500/f21/DIM20
Objective Value
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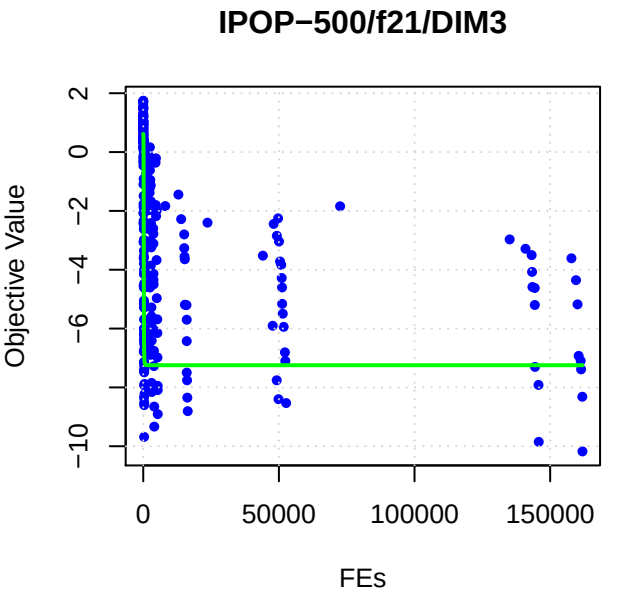
1.5e+07
FEs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Objective Value
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−6
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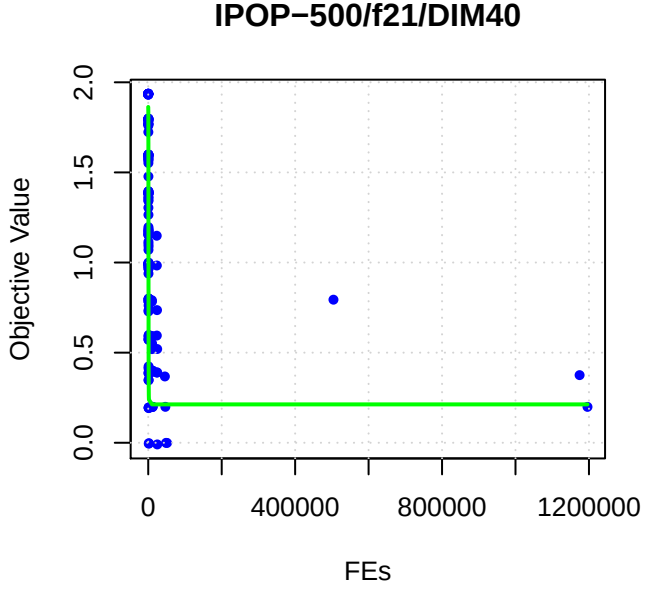
150000
FEs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Objective Value
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1.0
0.5
0.0
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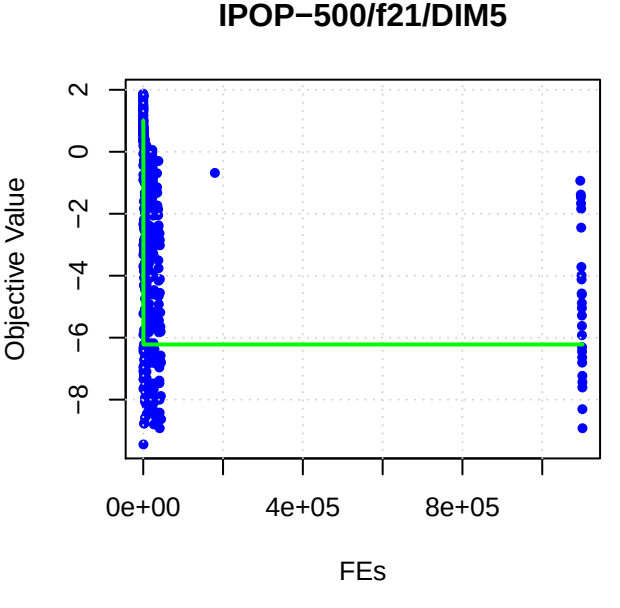
800000
1200000
FEs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Objective Value
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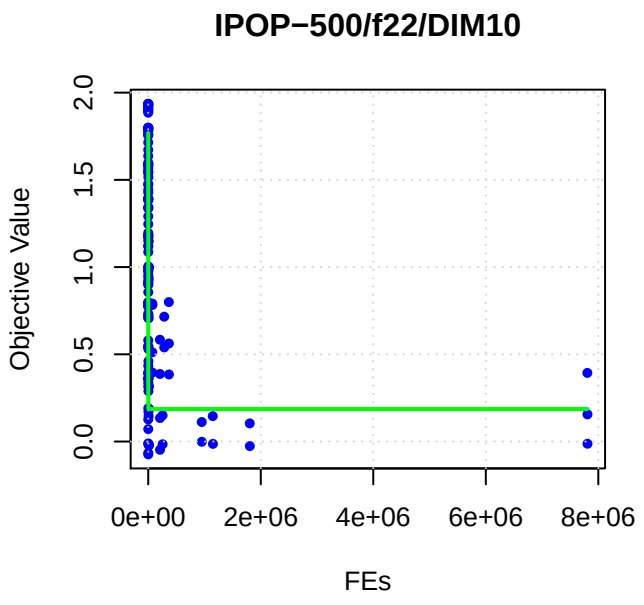
8e+05
FEs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Objective Value
FEs
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1.5
2.0
0e+00
2e+06
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6e+06
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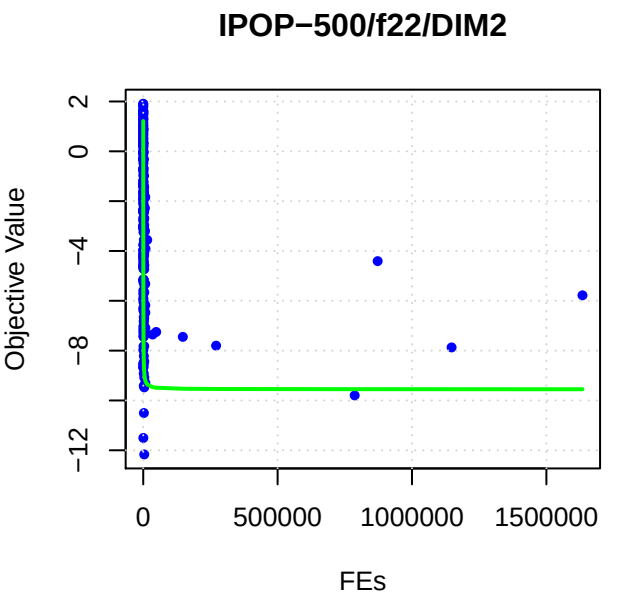
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Objective Value
FEs
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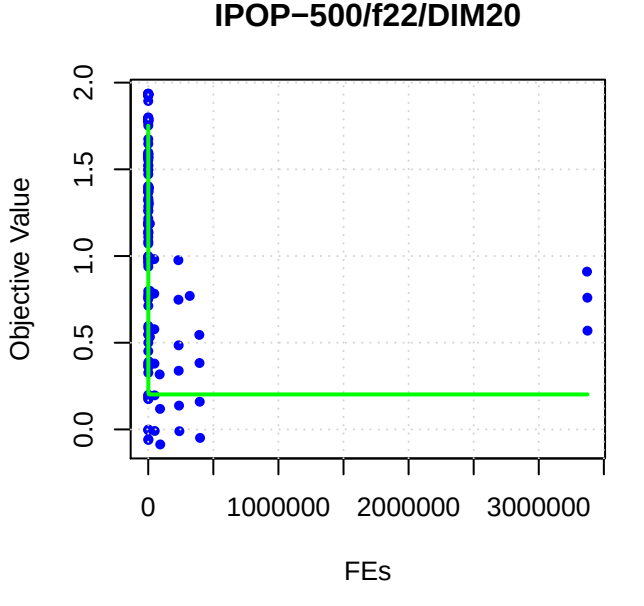
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Objective Value
FEs
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1.5
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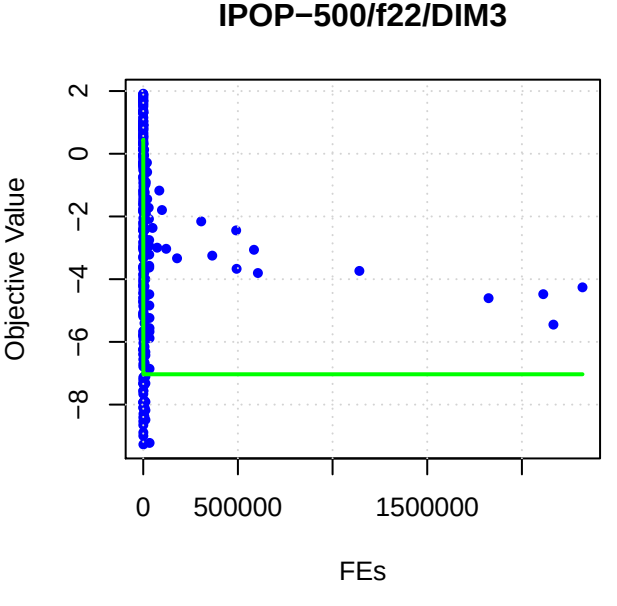
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Objective Value
FEs
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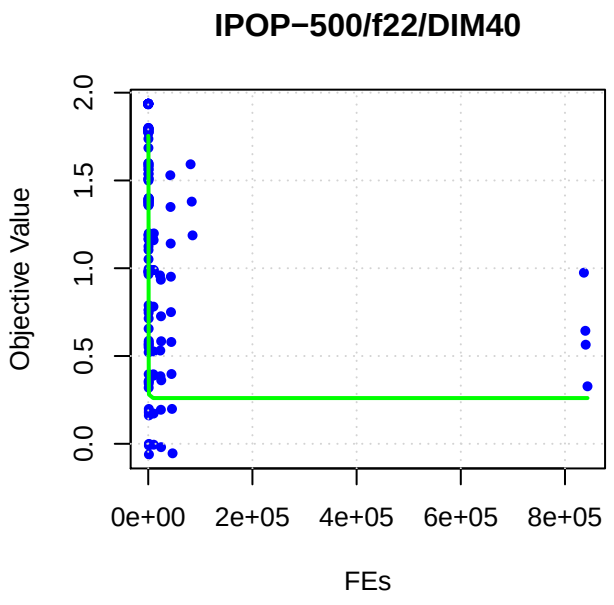
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Objective Value
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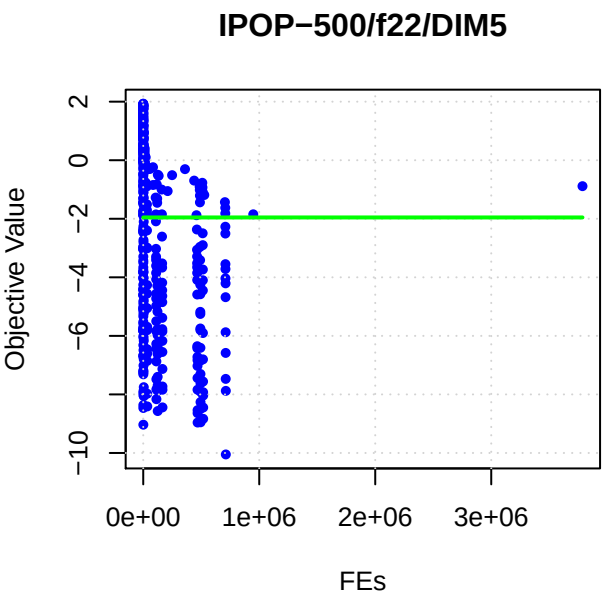
FEs


IPOP−500/f22/DIM5
Objective Value
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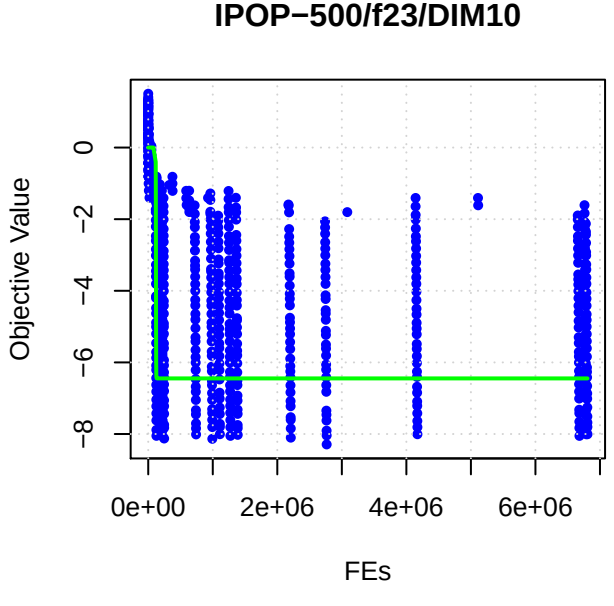
FEs


IPOP−500/f23/DIM10
Objective Value
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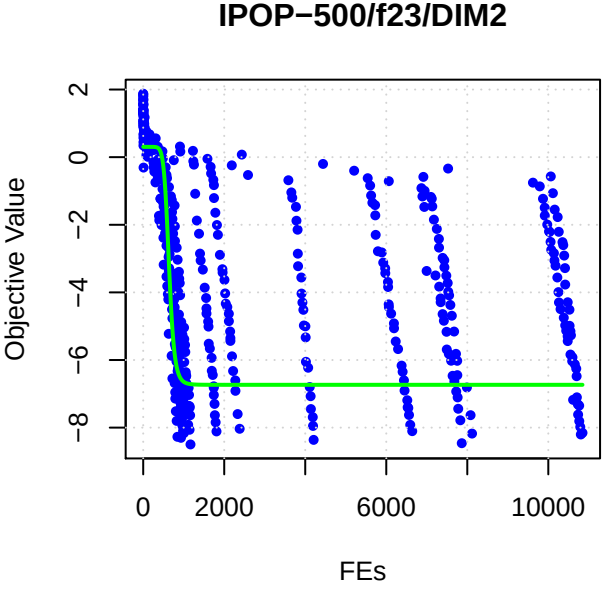
FEs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Objective Value
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−6
−8
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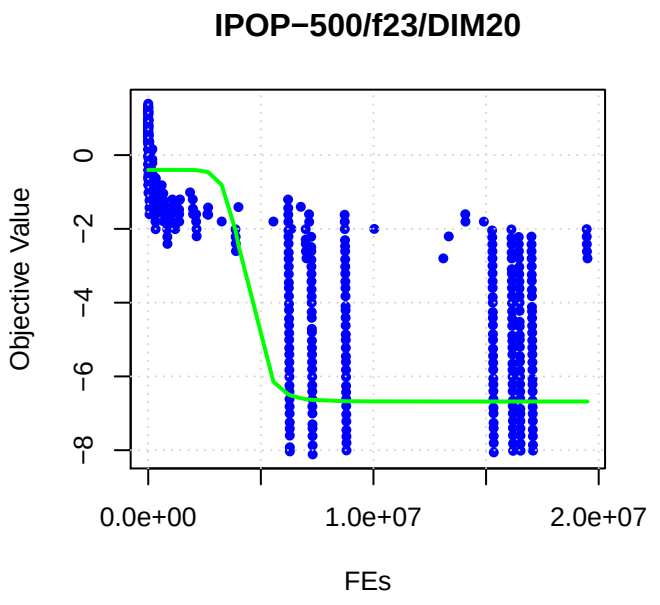
2000
6000
10000
FEs


IPOP−500/f23/DIM20
Objective Value
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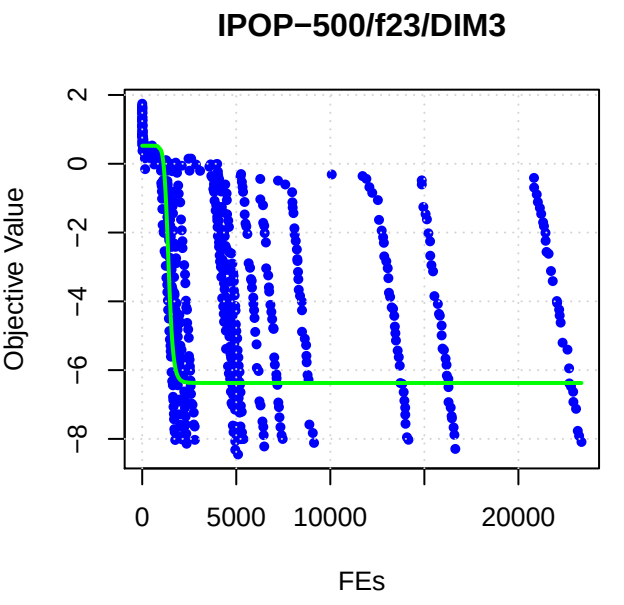
2.0e+07
FEs


IPOP−500/f23/DIM3
Objective Value
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−6
−8
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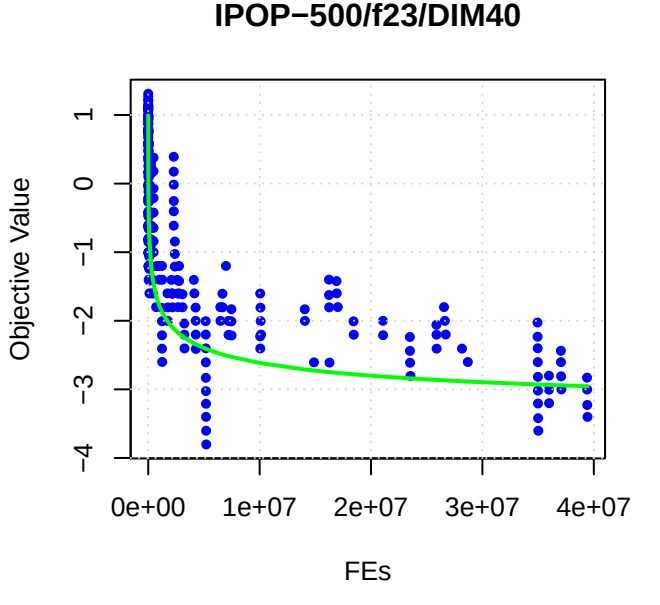
5000
10000
20000
FEs


IPOP−500/f23/DIM40
Objective Value
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−3
−4
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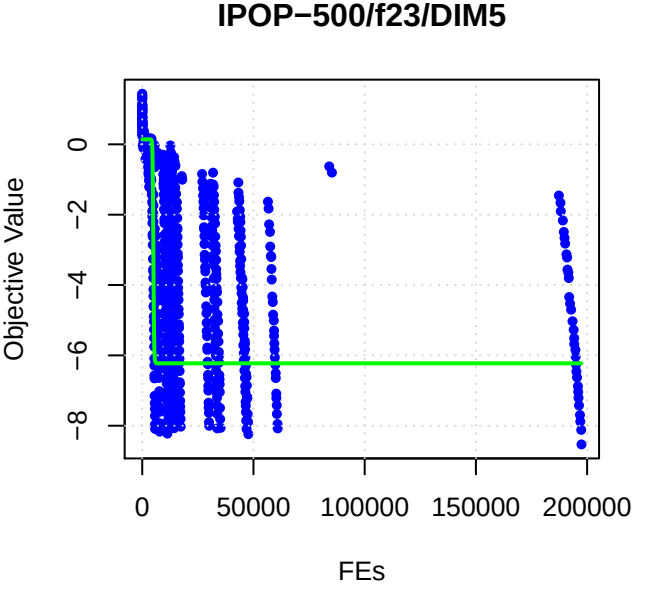
1e+07
2e+07
3e+07
4e+07
FEs


IPOP−500/f23/DIM5
Objective Value
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−8
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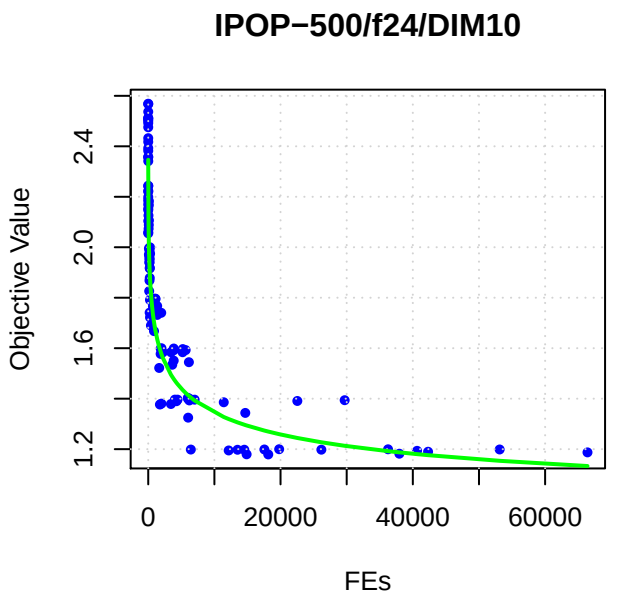
100000
150000
200000
FEs


IPOP−500/f24/DIM10
Objective Value
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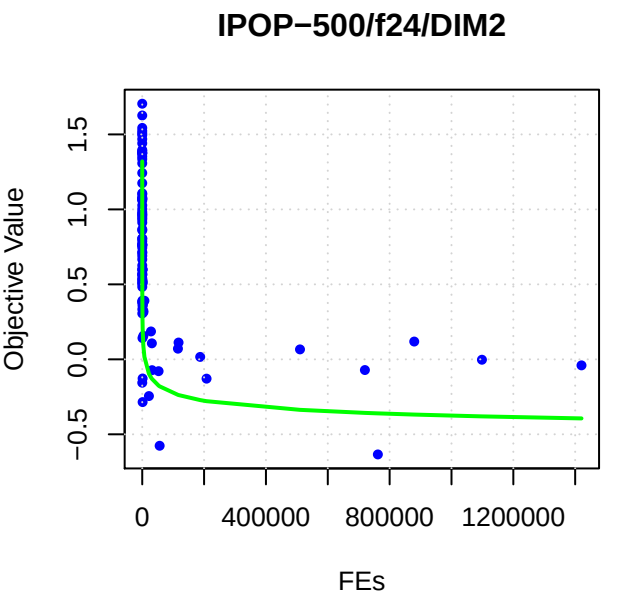
1.6
2.0
2.4
0
20000
40000
60000
FEs


IPOP−500/f24/DIM2
Objective Value
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0.5
1.0
1.5
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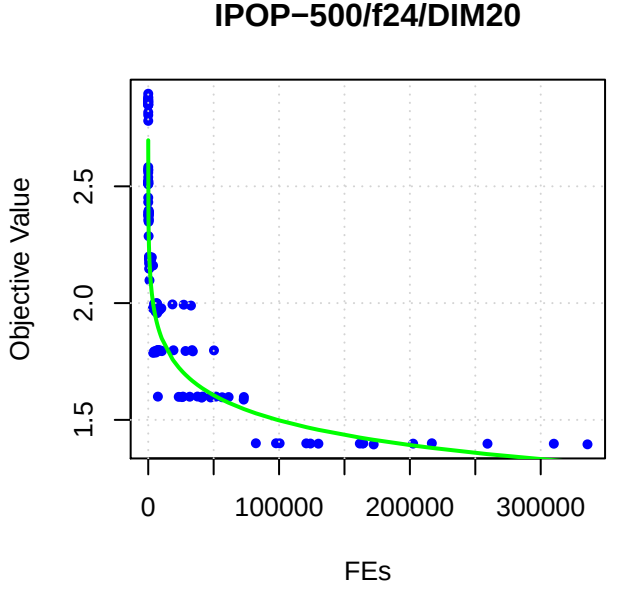
800000
1200000
FEs


IPOP−500/f24/DIM20
Objective Value
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2.5
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200000
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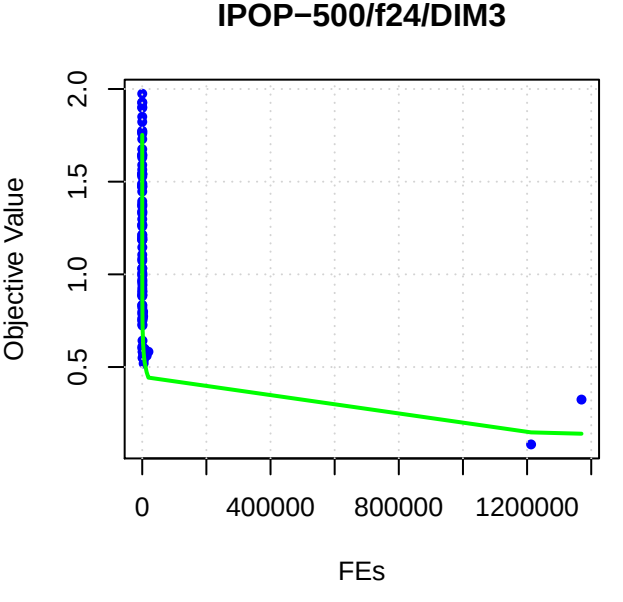
FEs


IPOP−500/f24/DIM3
Objective Value
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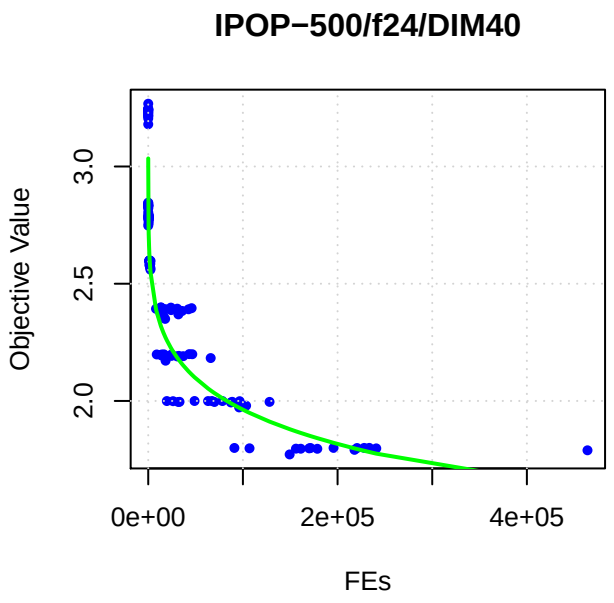
1.0
1.5
2.0
0
400000
800000
1200000
FEs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Objective Value
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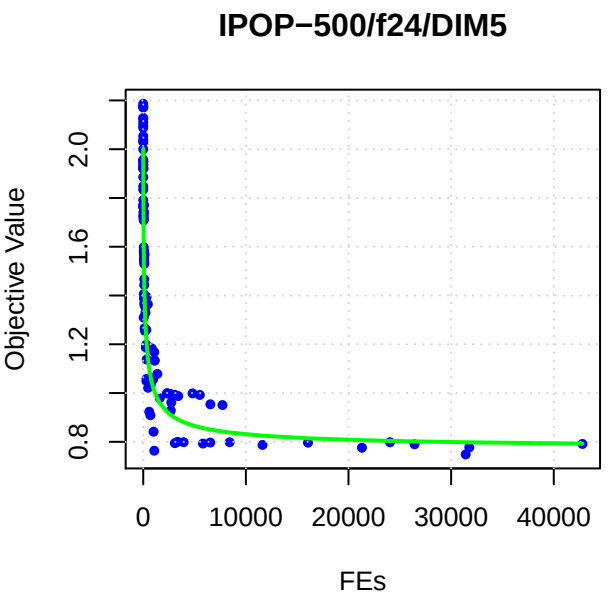
2.5
2.0
0e+00
2e+05
4e+05
FEs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Objective Value
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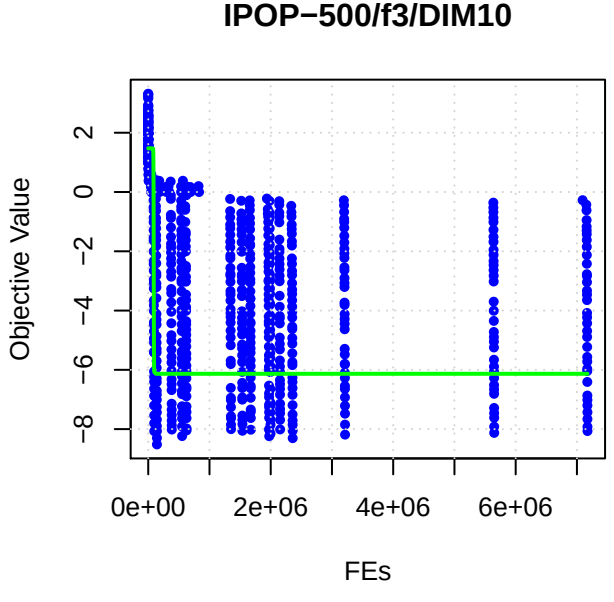
1.2
0.8
0
10000
20000
30000
40000
FEs


IPOP−500/f3/DIM10
Objective Value
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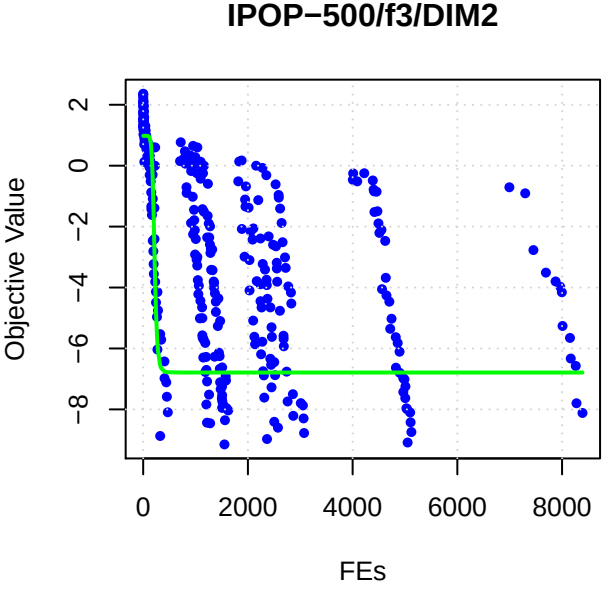
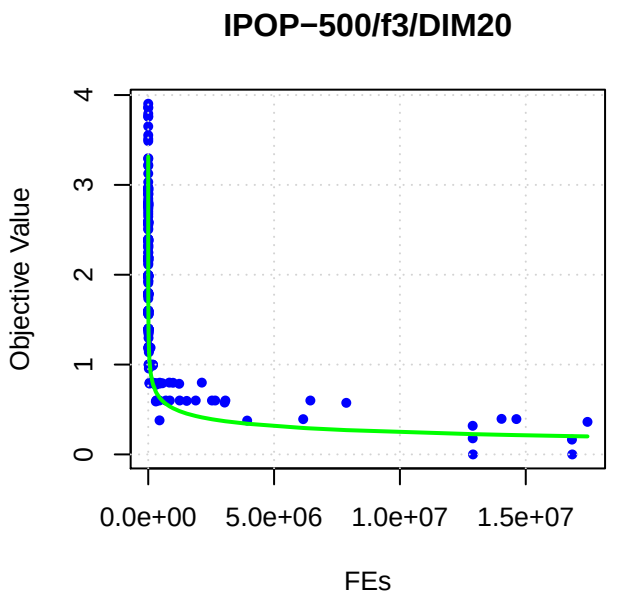
0
−2
−4
−6
−8
0e+00
2e+06
4e+06
6e+06
FEs


IPOP−500/f3/DIM2
Objective Value
2
0
−2
−4
−6
−8
0
2000
4000
6000
8000
FEs


IPOP−500/f3/DIM20
Objective Value
FEs
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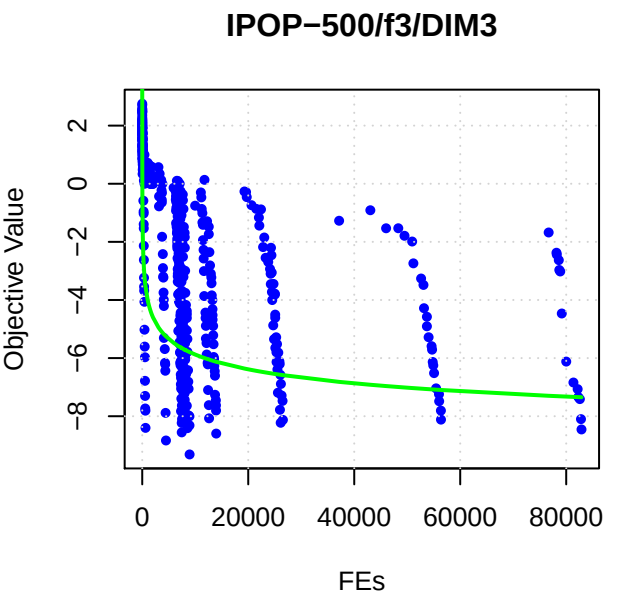
1
2
3
4
0.0e+00
5.0e+06
1.0e+07
1.5e+07


IPOP−500/f3/DIM3
Objective Value
FEs
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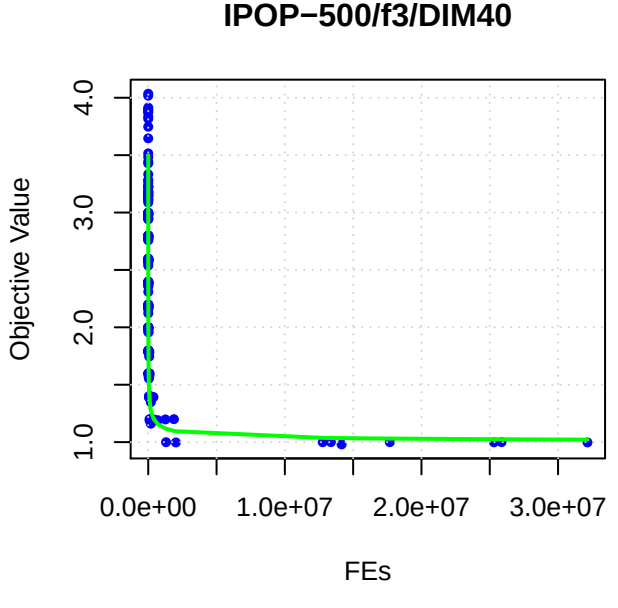
−6
−4
−2
0
2
0
20000
40000
60000
80000


IPOP−500/f3/DIM40
Objective Value
FEs
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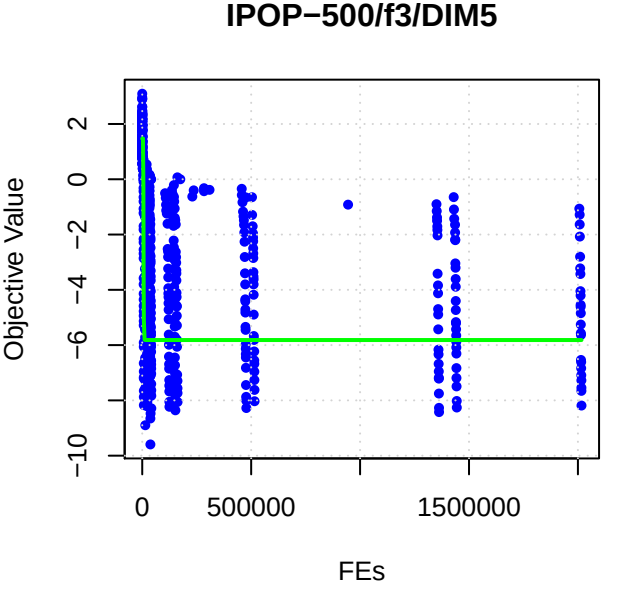
3.0
4.0
0.0e+00
1.0e+07
2.0e+07
3.0e+07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Objective Value
FEs
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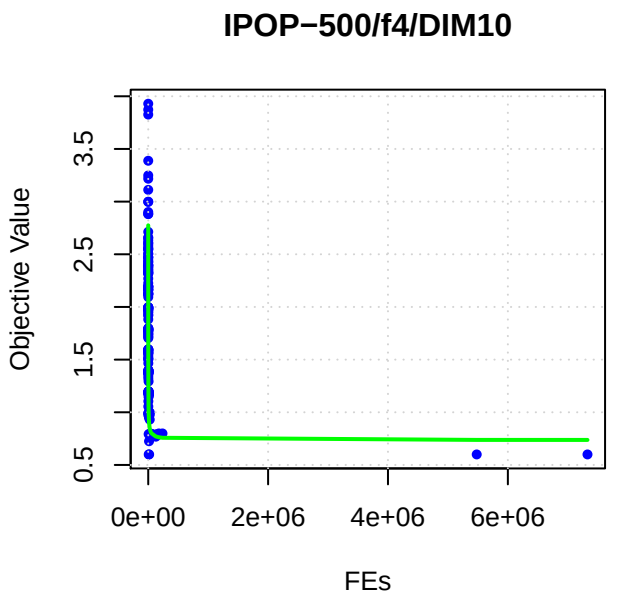
−6
−4
−2
0
2
0
500000
1500000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Objective Value
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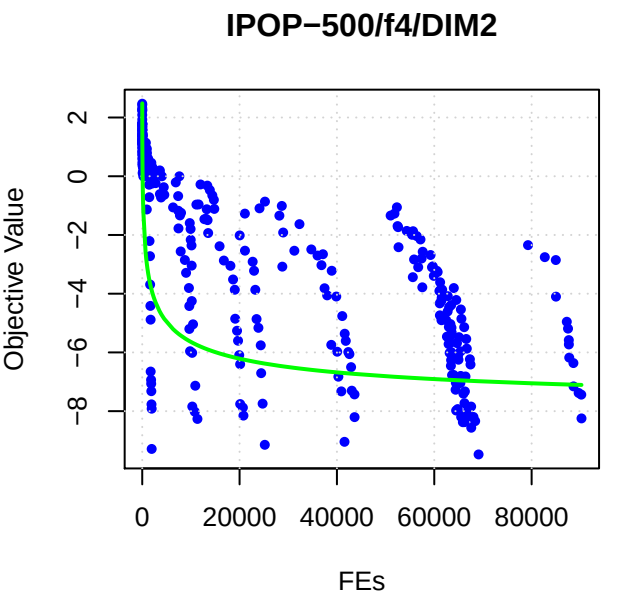
1.5
2.5
3.5
0e+00
2e+06
4e+06
6e+06
FEs


IPOP−500/f4/DIM2
Objective Value
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−2
−4
−6
−8
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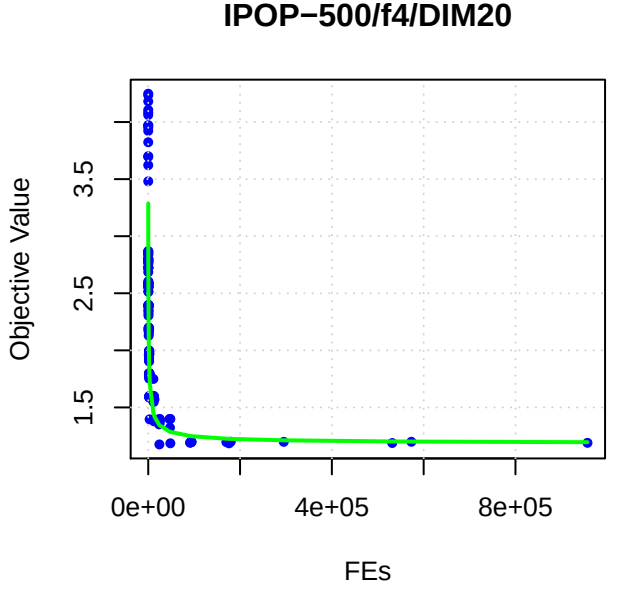
40000
60000
80000
FEs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Objective Value
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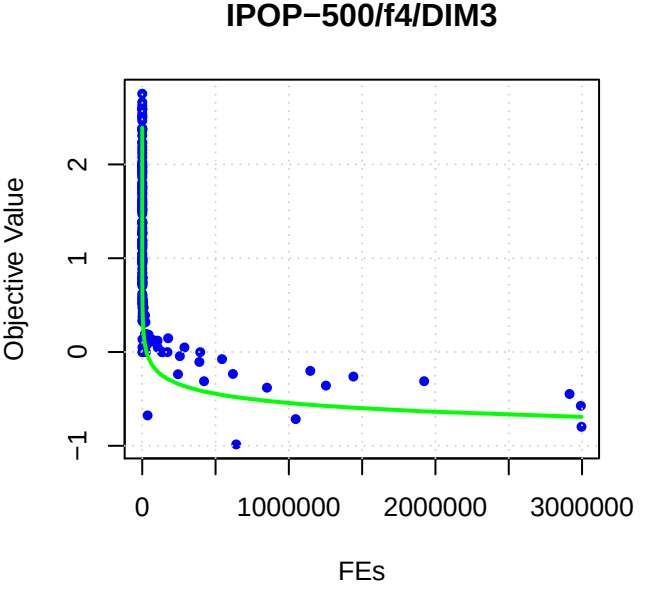
2.5
3.5
0e+00
4e+05
8e+05
FEs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Objective Value
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1
2
0
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2000000
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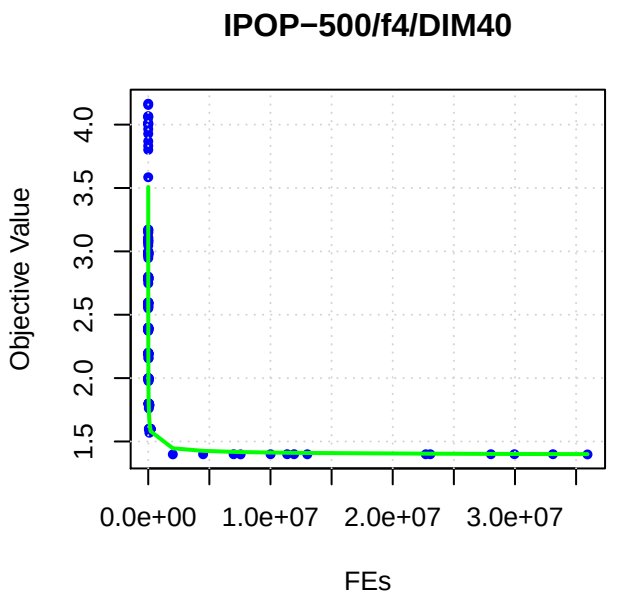
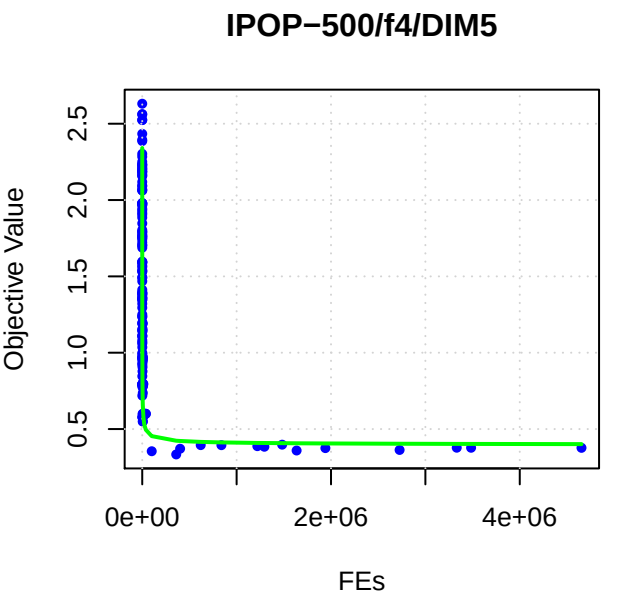
FEs


IPOP−500/f4/DIM40
Objective Value
4.0
3.5
3.0
2.5
2.0
1.5
0.0e+00
1.0e+07
2.0e+07
3.0e+07
FEs


IPOP−500/f4/DIM5
Objective Value
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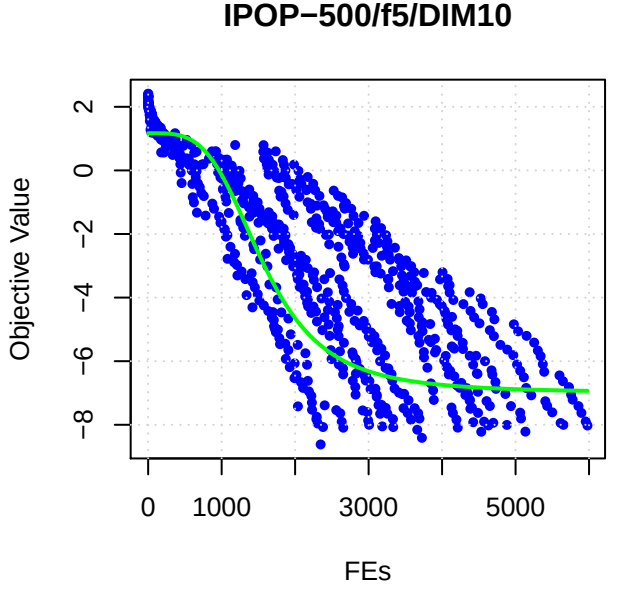
2.0
1.5
1.0
0.5
0e+00
2e+06
4e+06
FEs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Objective Value
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−4
−6
−8
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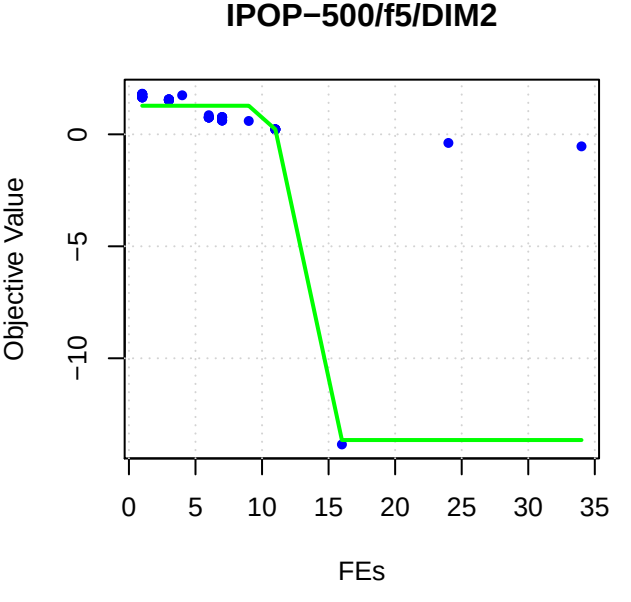
1000
3000
5000
FEs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Objective Value
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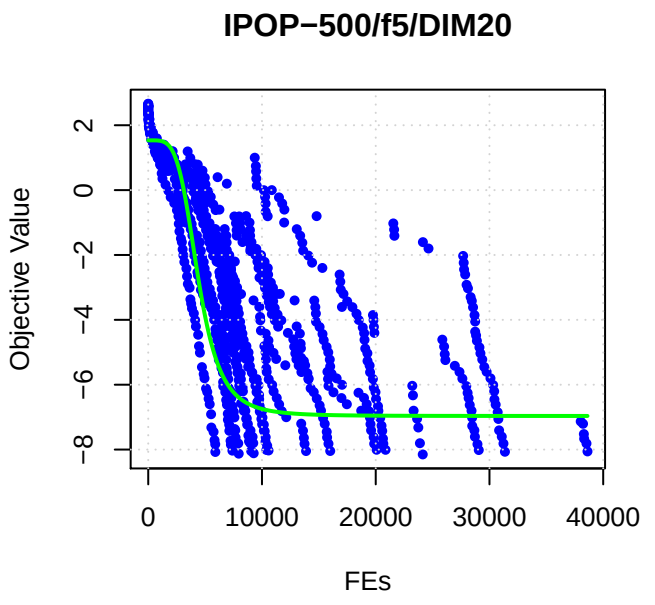
−10
0
5
10
15
20
25
30
35
FEs


IPOP−500/f5/DIM20
Objective Value
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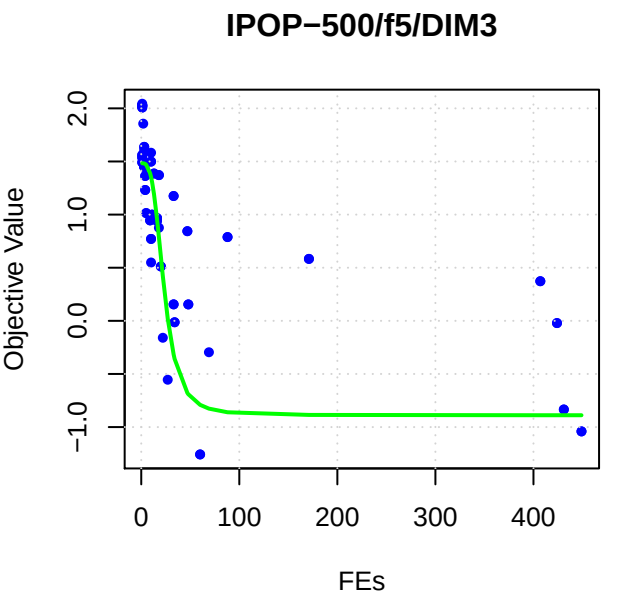
0
−2
−4
−6
−8
0
10000
20000
30000
40000
FEs


IPOP−500/f5/DIM3
Objective Value
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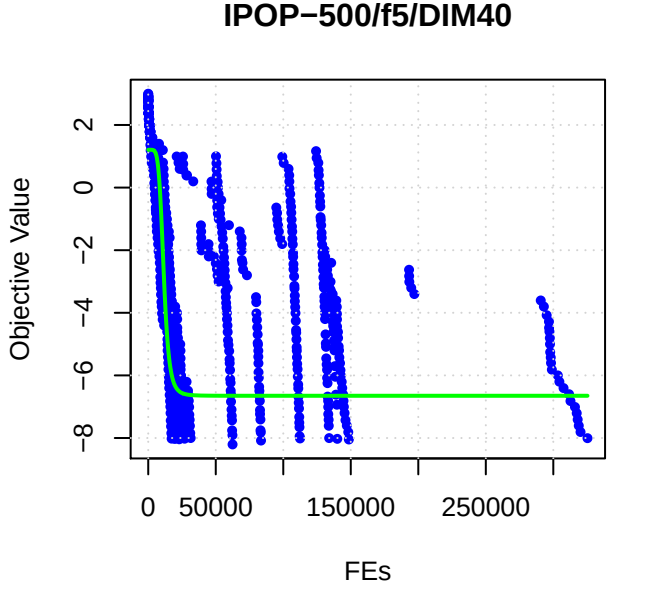
1.0
0.0
−1.0
0
100
200
300
400
FEs


IPOP−500/f5/DIM40
Objective Value
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−2
−4
−6
−8
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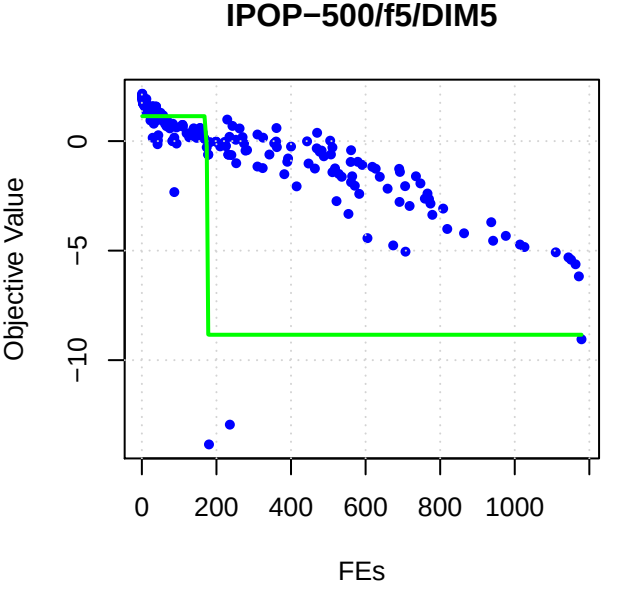
50000
150000
250000
FEs


IPOP−500/f5/DIM5
Objective Value
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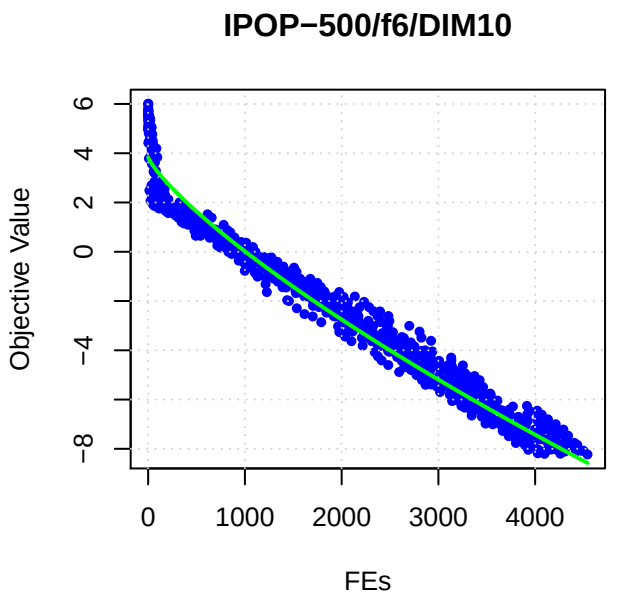
−5
−10
0
200
400
600
800
1000
FEs


IPOP−500/f6/DIM10
Objective Value
FEs
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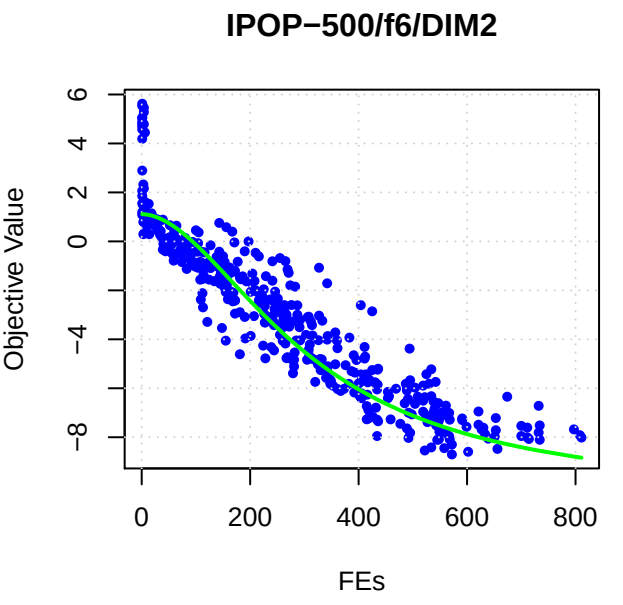
4
2
0
−4
−8
0
1000
2000
3000
4000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Objective Value
FEs
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0
−4
−8
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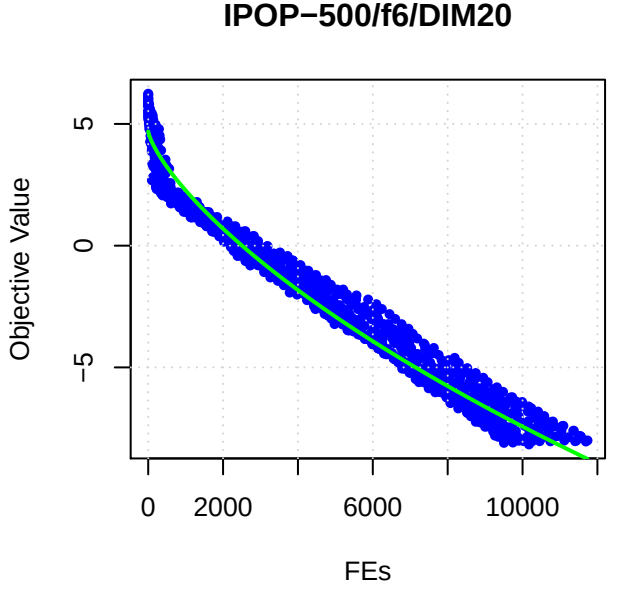
400
600
800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Objective Value
FEs
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0
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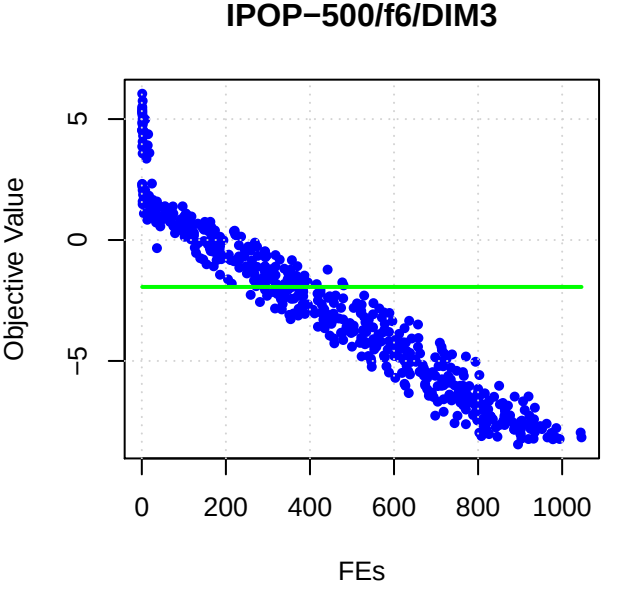
6000
10000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Objective Value
FEs
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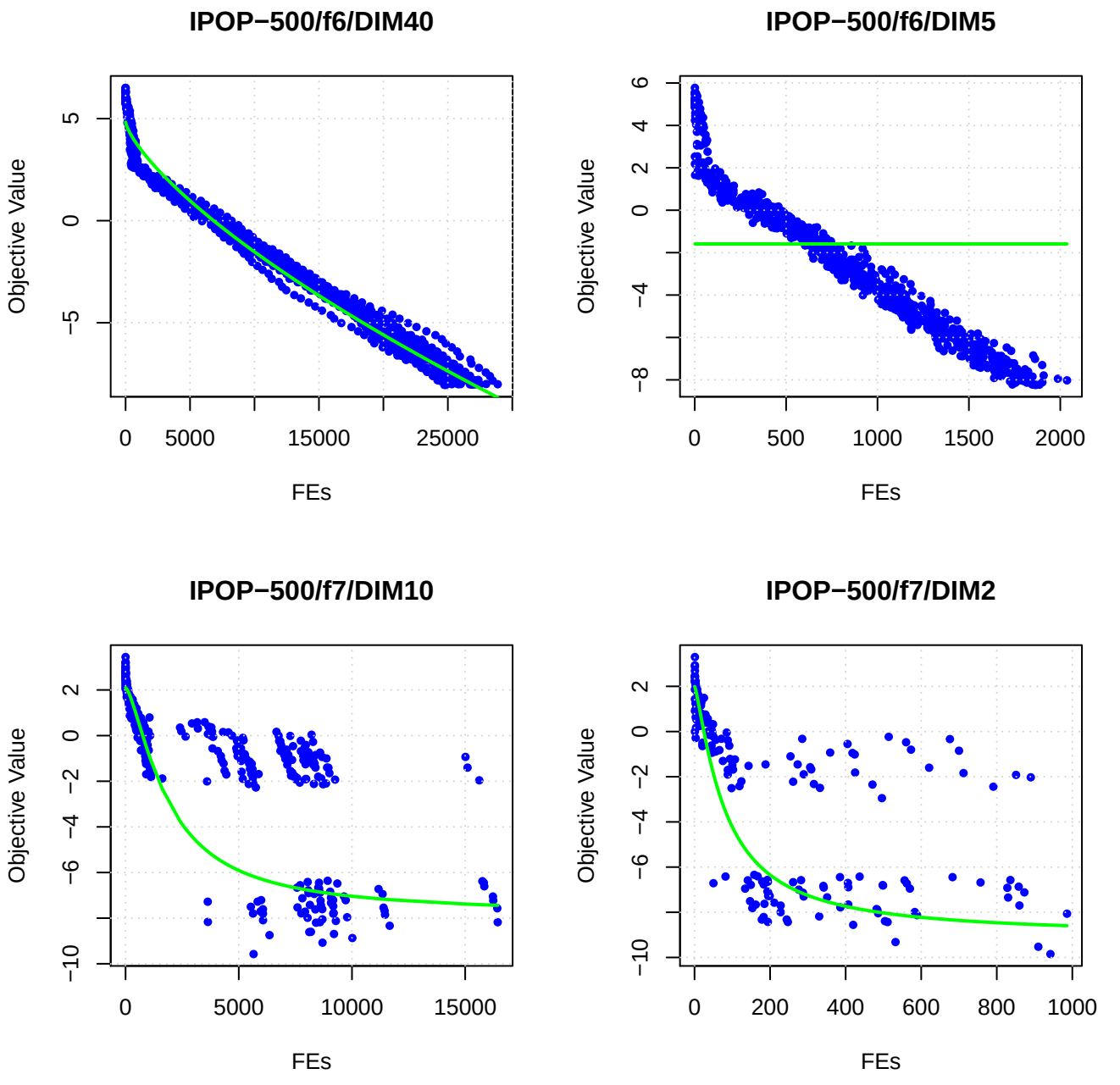
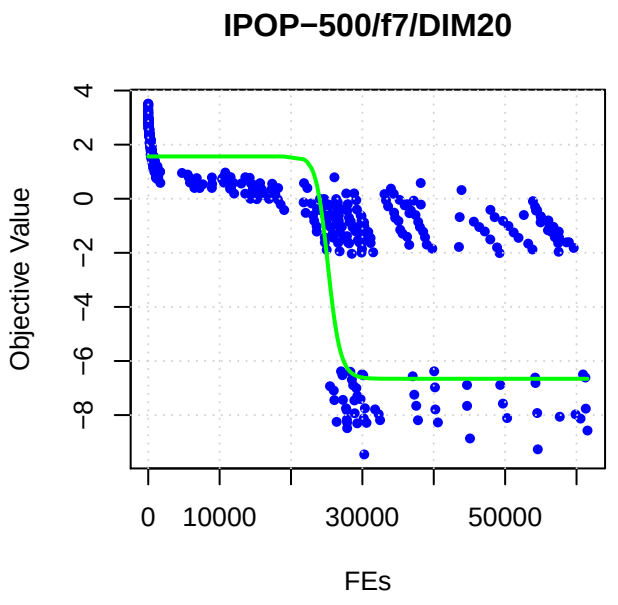
800
1000


IPOP−500/f6/DIM40
Objective Value
FEs
IPOP−500/f6/DIM5
Objective Value
FEs
IPOP−500/f7/DIM10
Objective Value
FEs
IPOP−500/f7/DIM2
Objective Value
FEs


IPOP−500/f7/DIM20
Objective Value
FEs
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−2
−4
−6
−8
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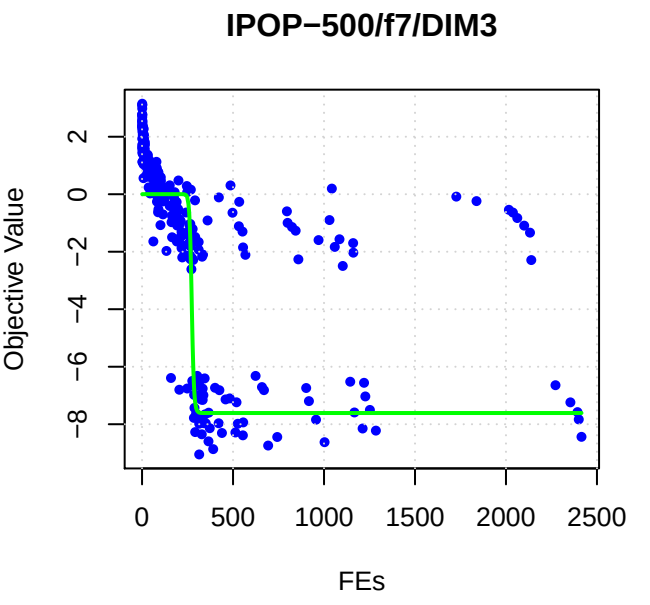
10000
30000
50000


IPOP−500/f7/DIM3
Objective Value
FEs
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−2
−4
−6
−8
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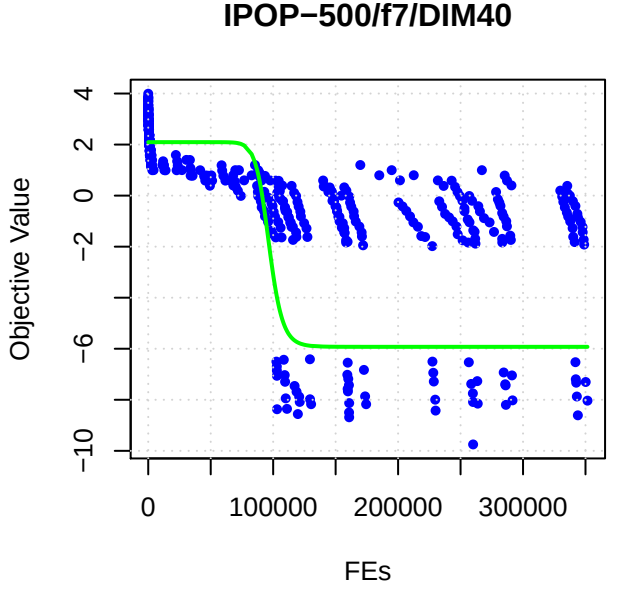
1000
1500
2000
2500


IPOP−500/f7/DIM40
Objective Value
FEs
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−2
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−10
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200000
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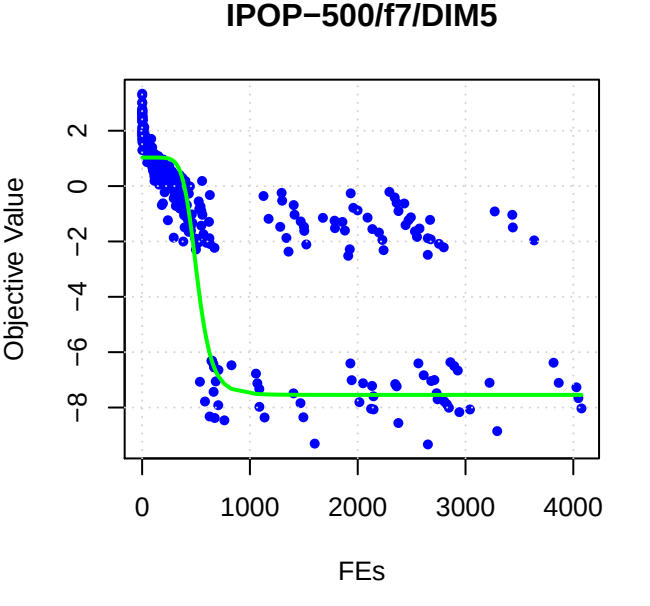
IPOP−500/f7/DIM5
Objective Value
FEs
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−4
−6
−8
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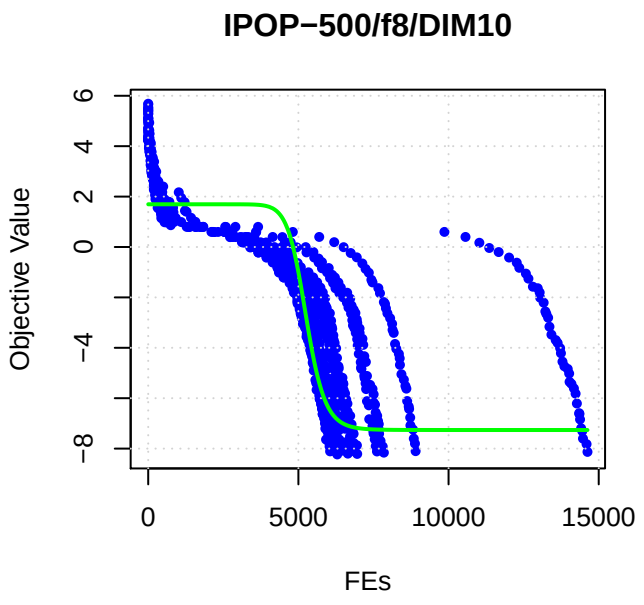
2000
3000
4000


IPOP−500/f8/DIM10
Objective Value
FEs
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2
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−4
−8
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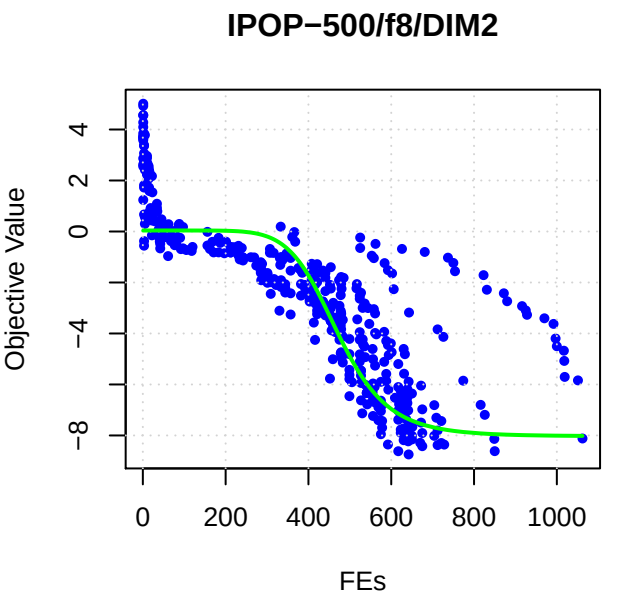
5000
10000
15000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Objective Value
FEs
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2
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−4
−8
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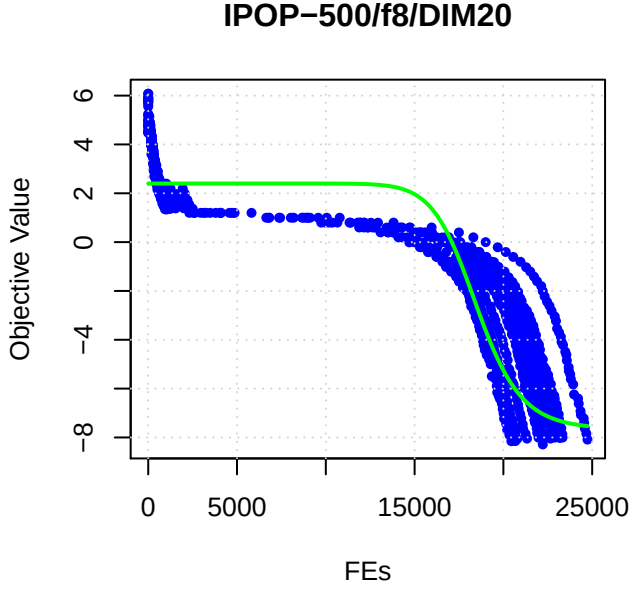
400
600
800
1000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Objective Value
FEs
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2
0
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−8
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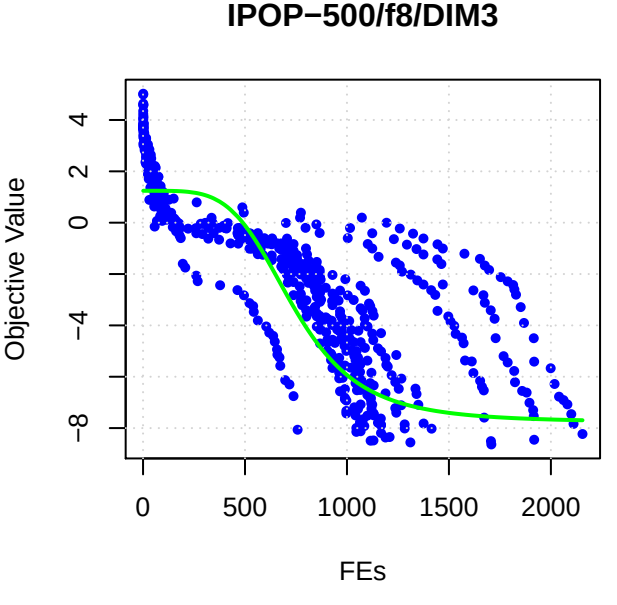
15000
25000


IPOP−500/f8/DIM3
Objective Value
FEs
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2
0
−4
−8
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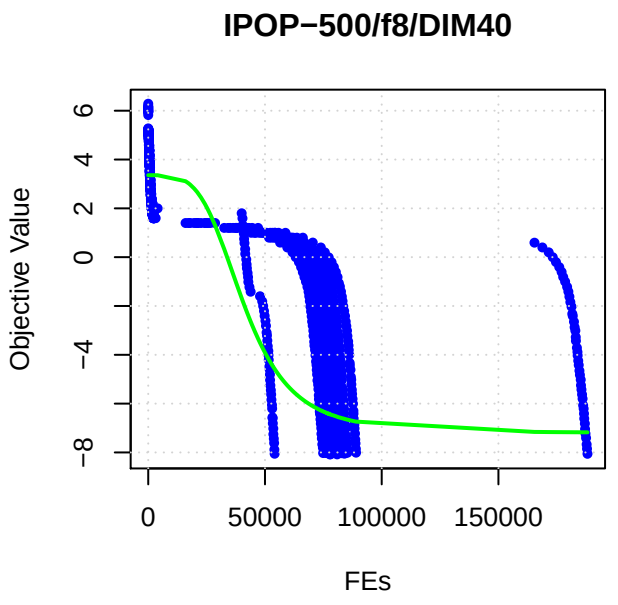
500
1000
1500
2000


IPOP−500/f8/DIM40
Objective Value
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4
2
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−4
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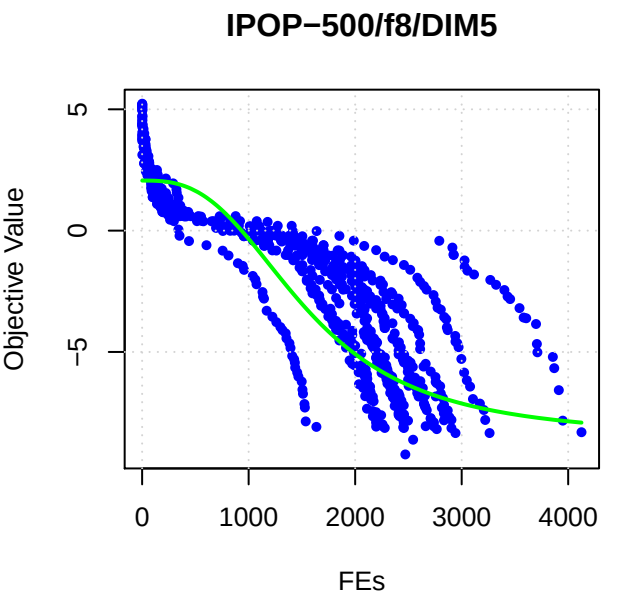
100000
150000
FEs


IPOP−500/f8/DIM5
Objective Value
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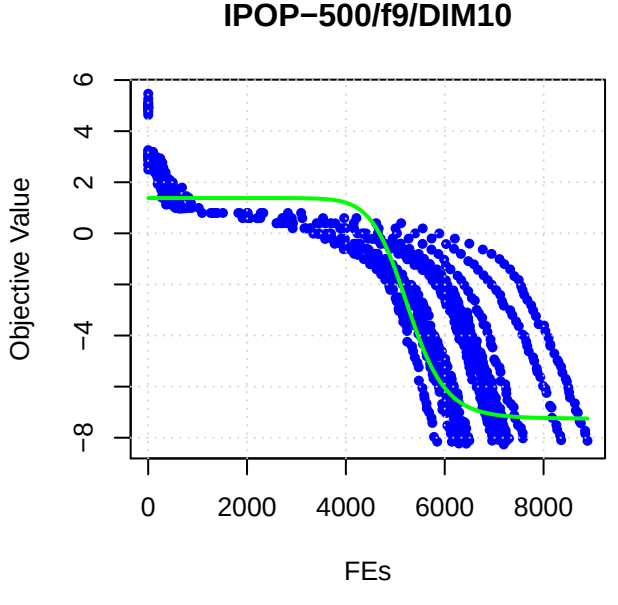
1000
2000
3000
4000
FEs


IPOP−500/f9/DIM10
Objective Value
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2
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−4
−8
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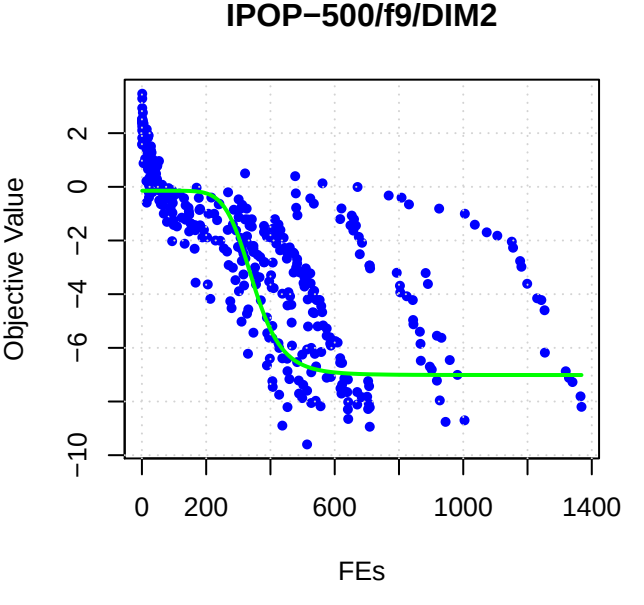
4000
6000
8000
FEs


IPOP−500/f9/DIM2
Objective Value
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−2
−4
−6
−10
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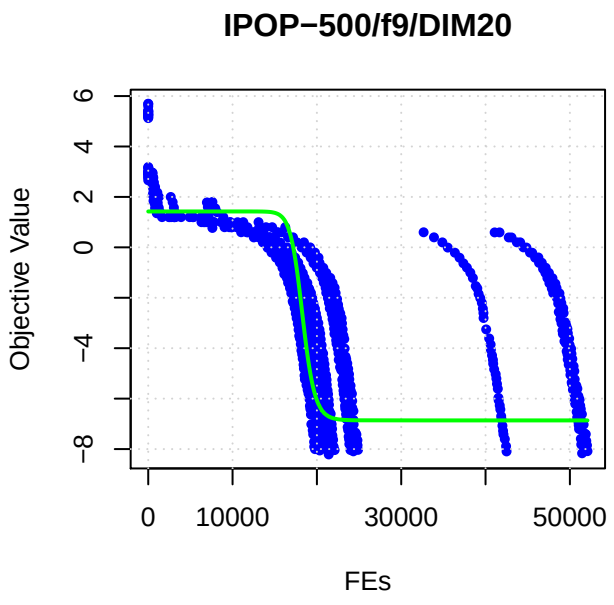
200
600
1000
1400
FEs


IPOP−500/f9/DIM20
Objective Value
FEs
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4
2
0
−4
−8
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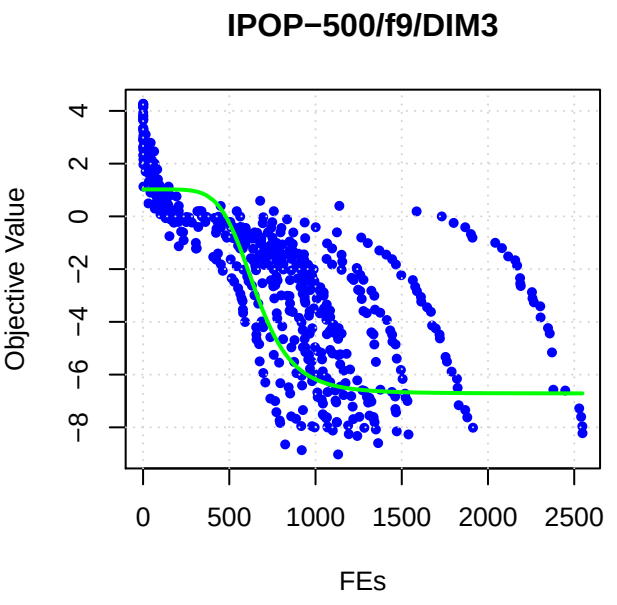
10000
30000
50000


IPOP−500/f9/DIM3
Objective Value
FEs
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−2
−4
−6
−8
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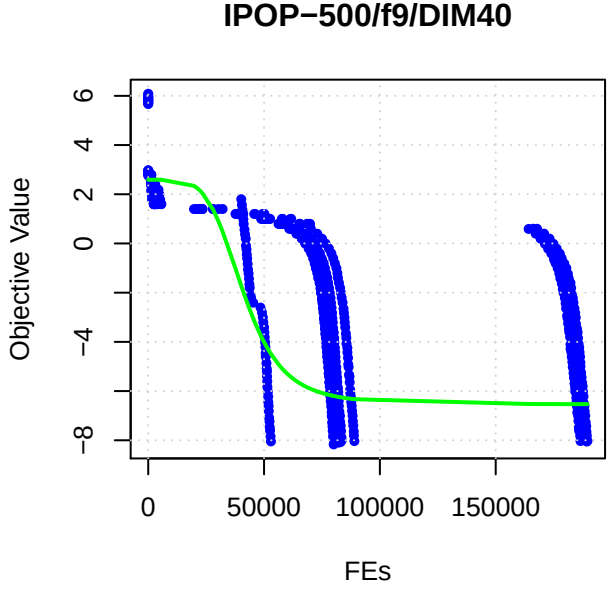
1000
1500
2000
2500


IPOP−500/f9/DIM40
Objective Value
FEs
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2
0
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−8
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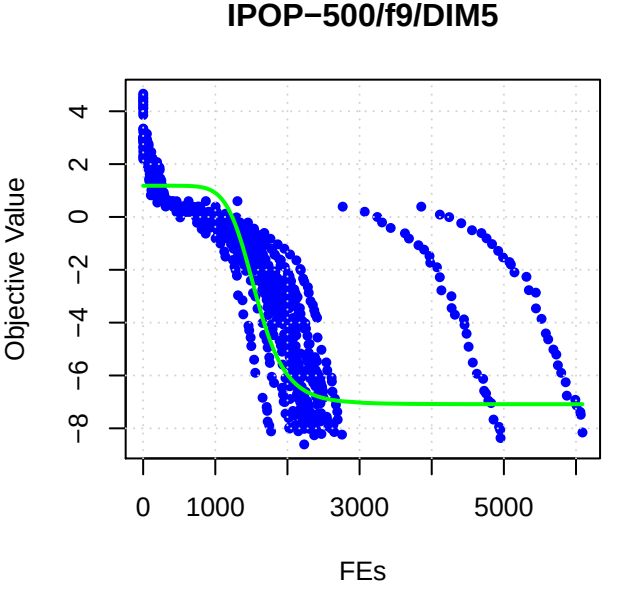
50000
100000
150000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Objective Value
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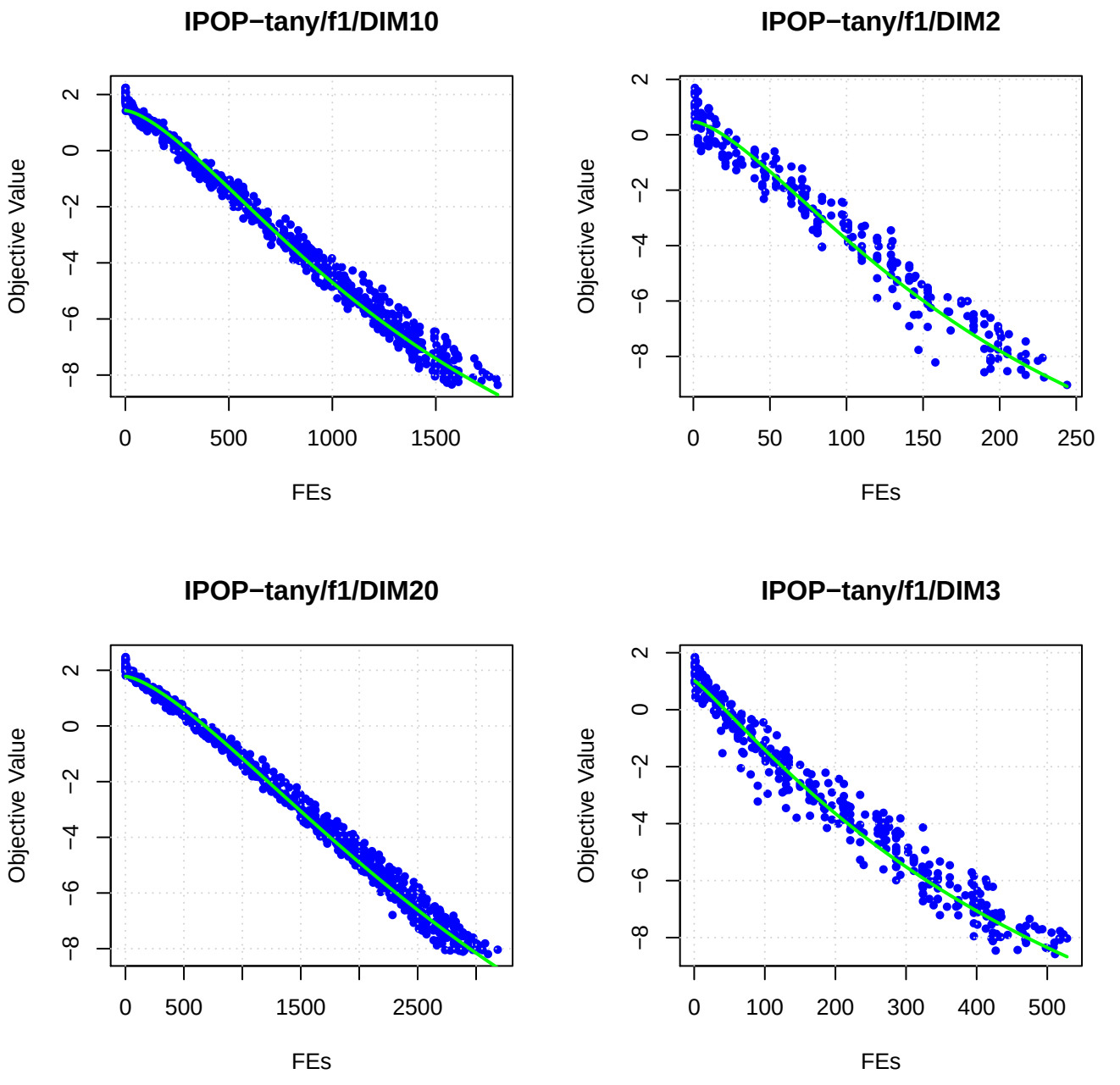
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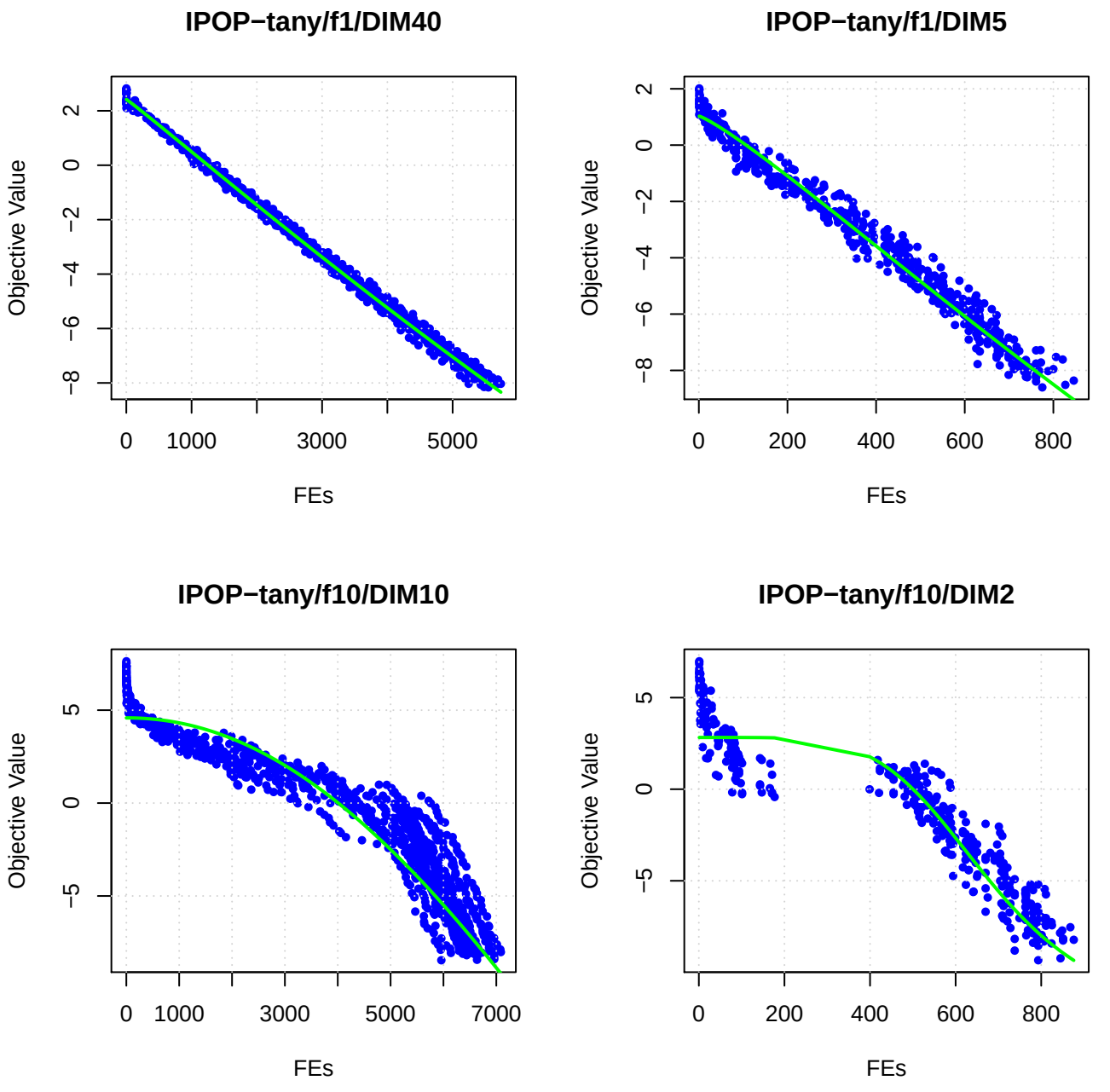
FEs
IPOP−tany/f1/DIM2
Objective Value
FEs
IPOP−tany/f1/DIM20
Objective Value
FEs
IPOP−tany/f1/DIM3
Objective Value
FEs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Objective Value
FEs
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Objective Value
FEs
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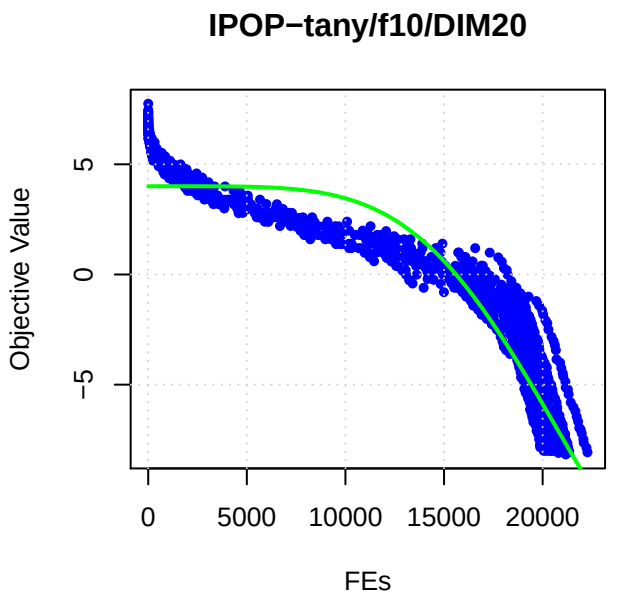
Objective Value
FEs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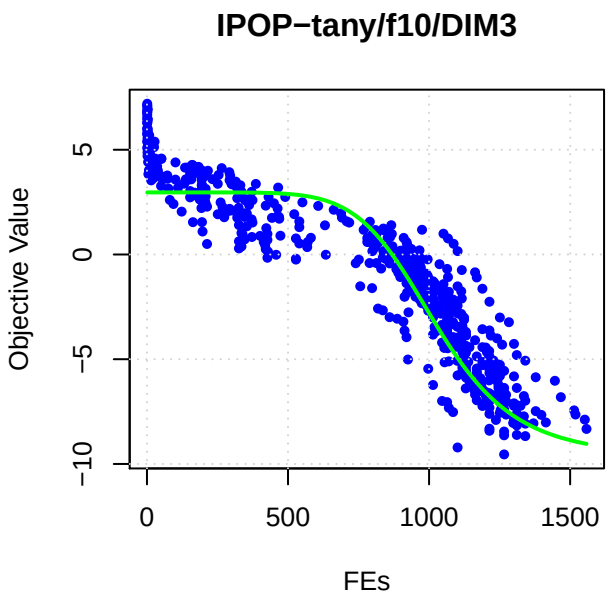
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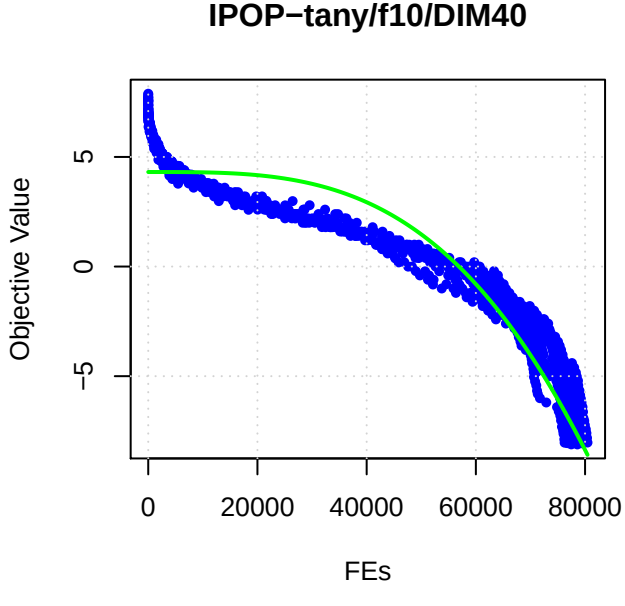
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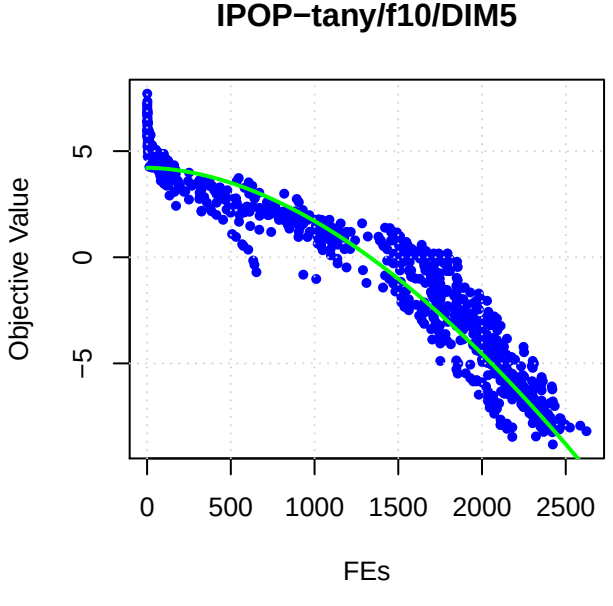
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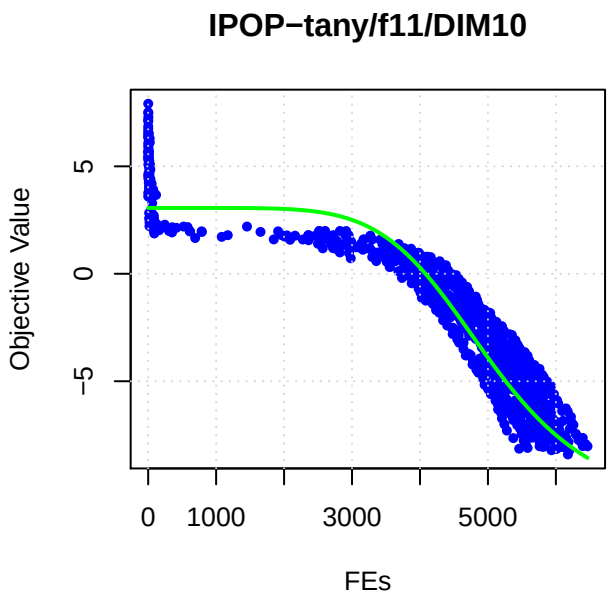
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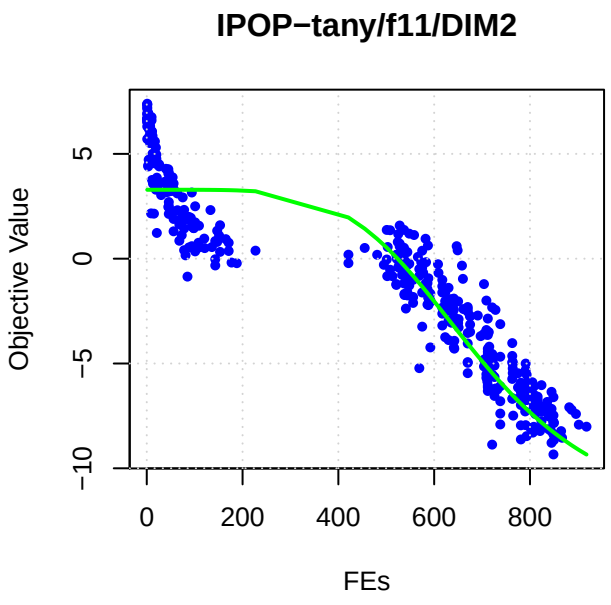
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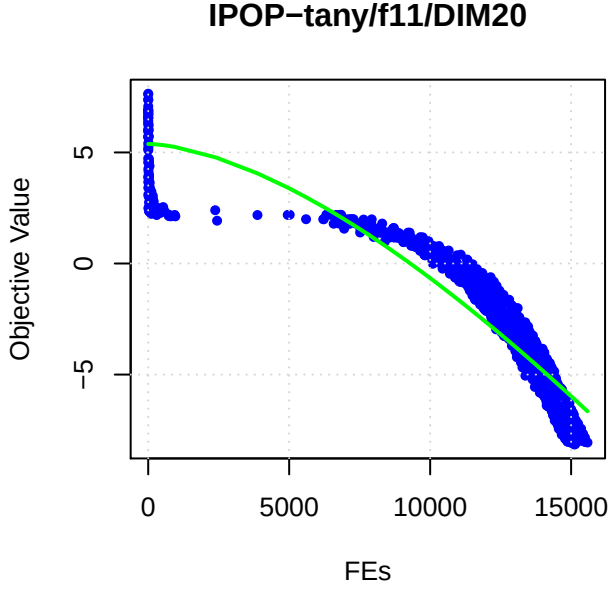
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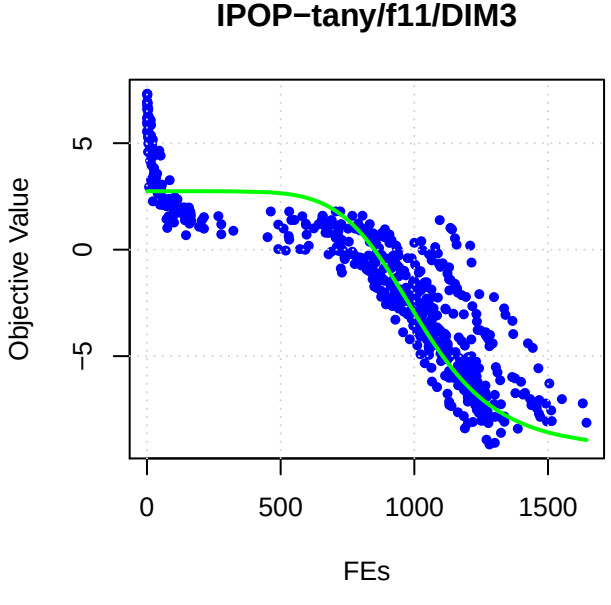
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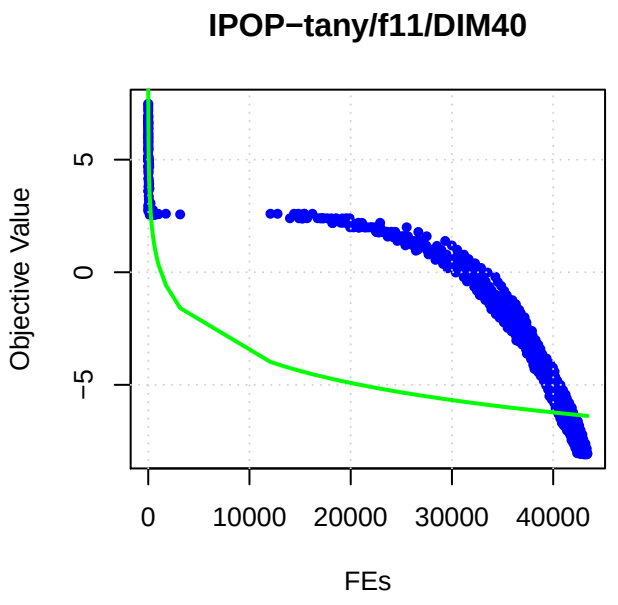
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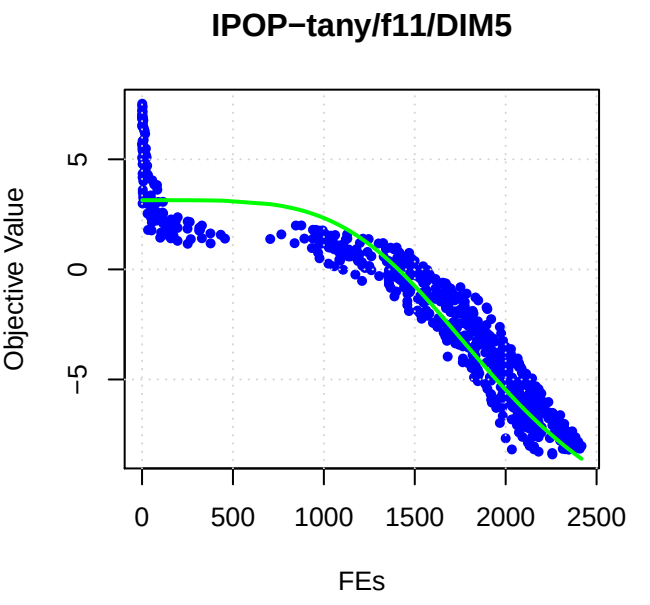
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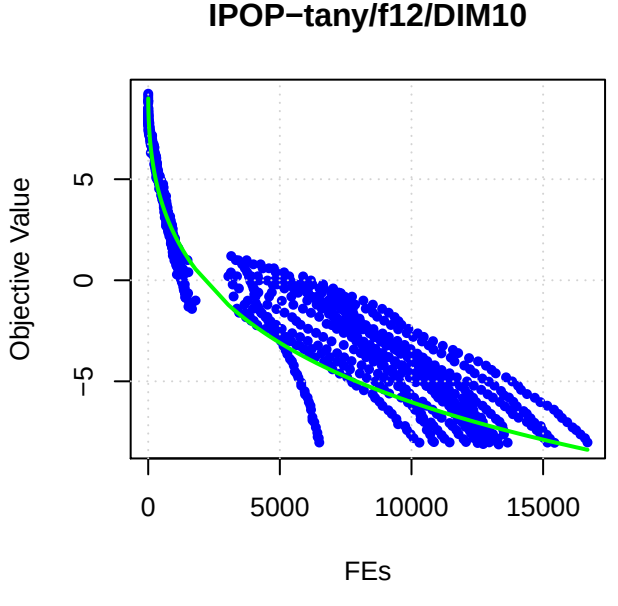
FEs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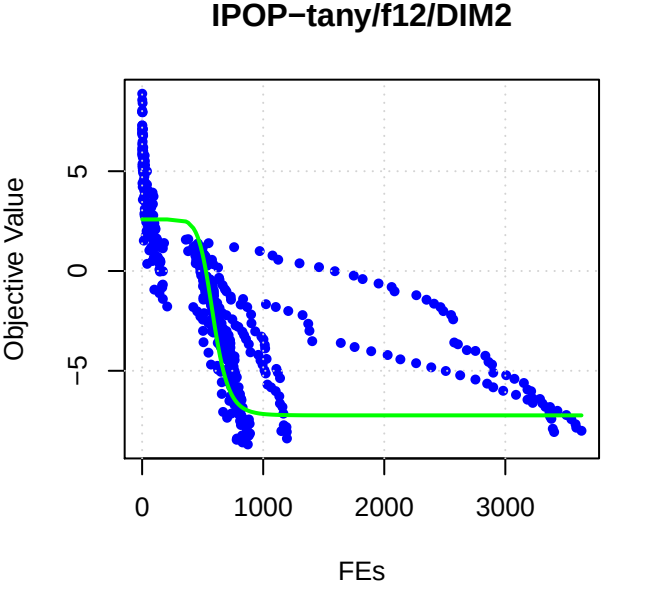
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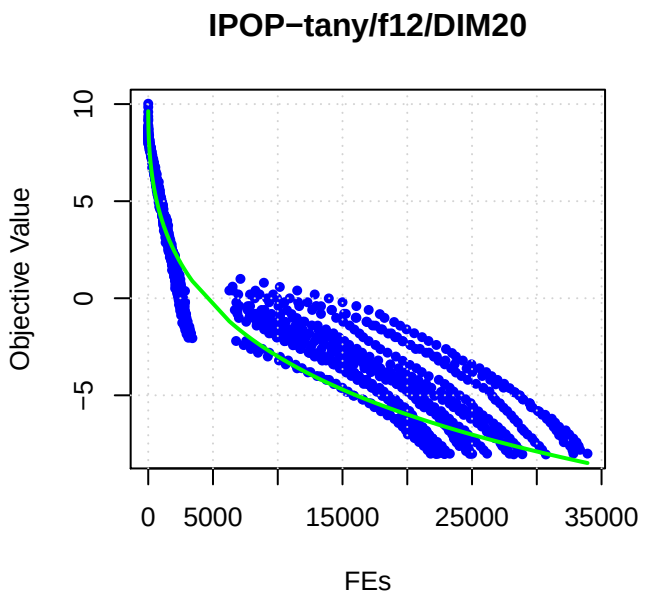
FEs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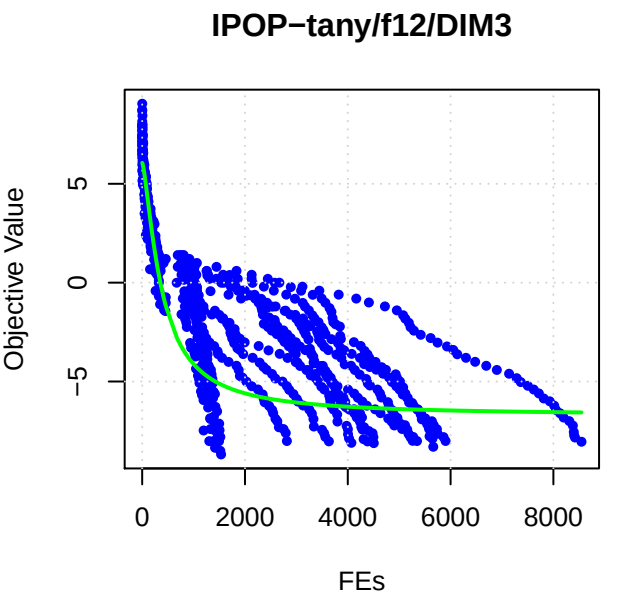
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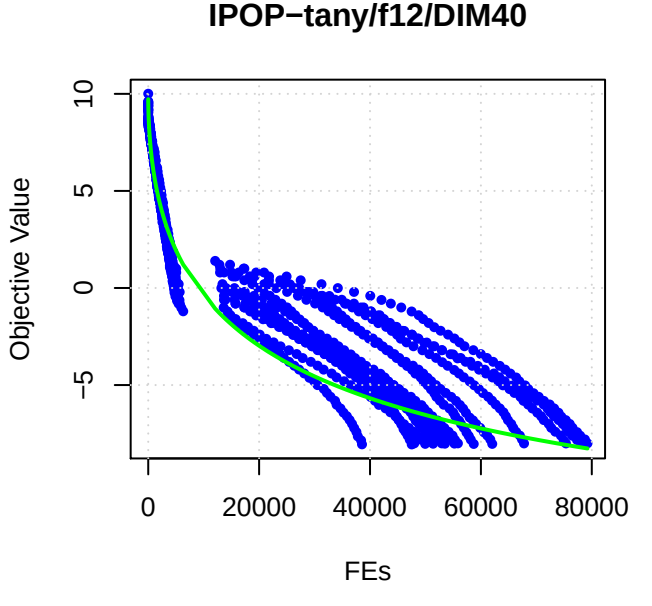
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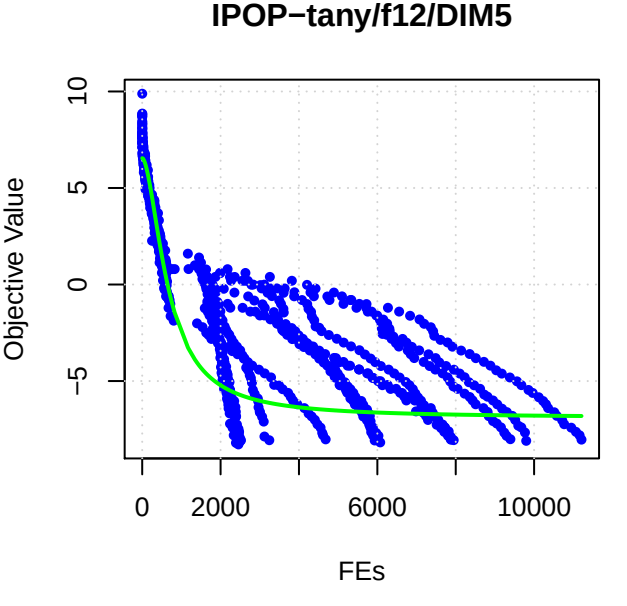
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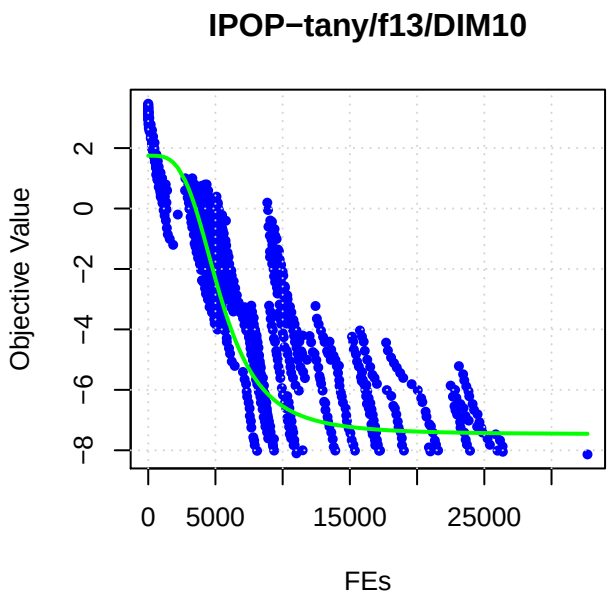
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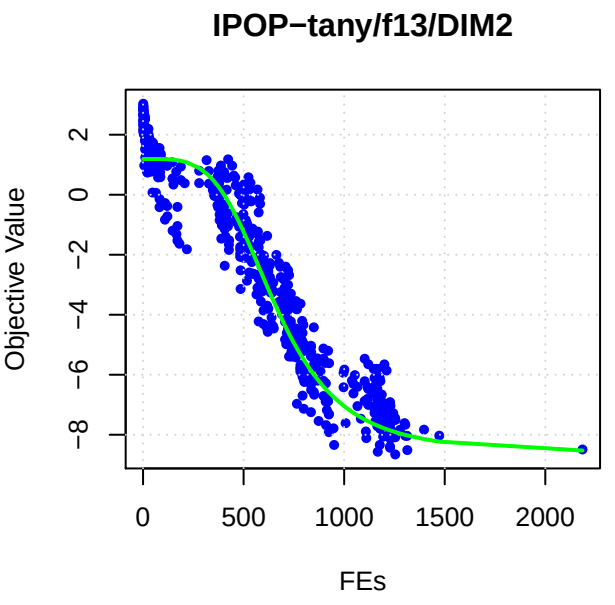
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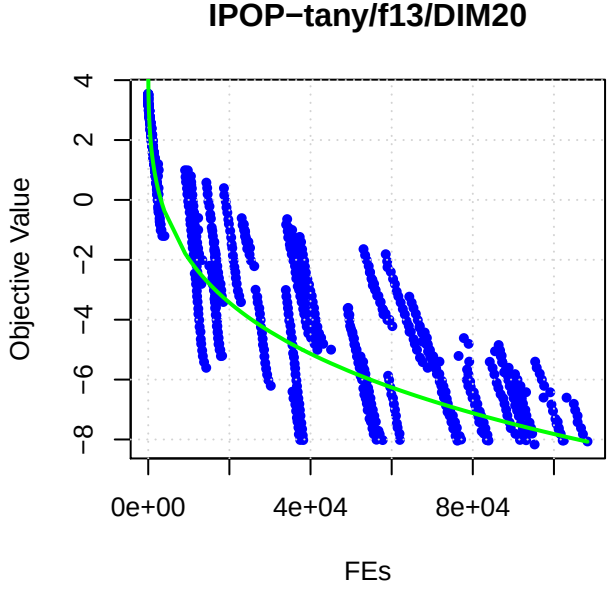
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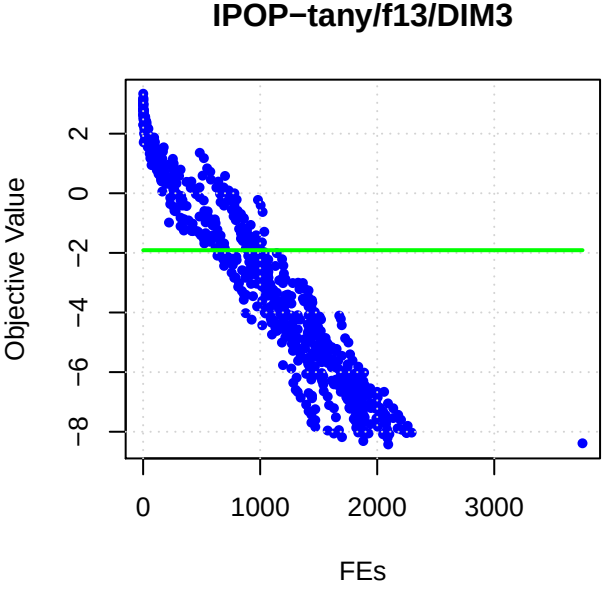
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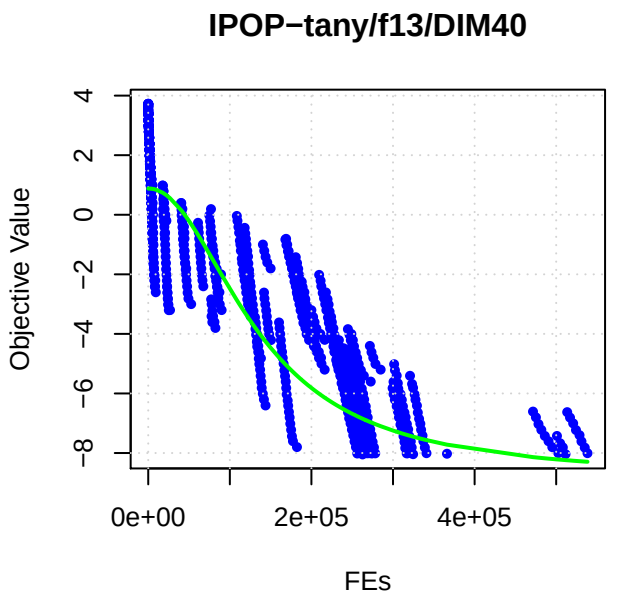
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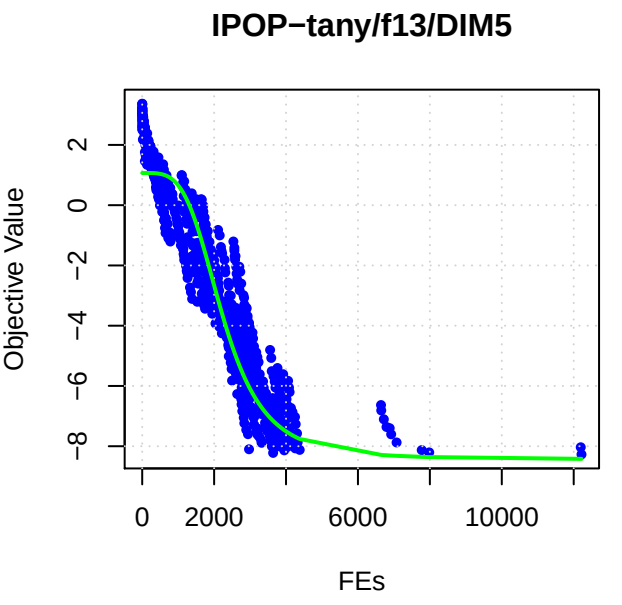
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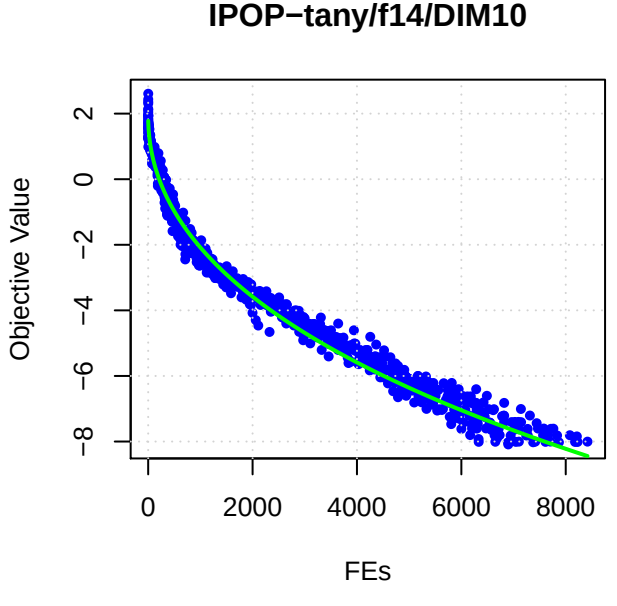
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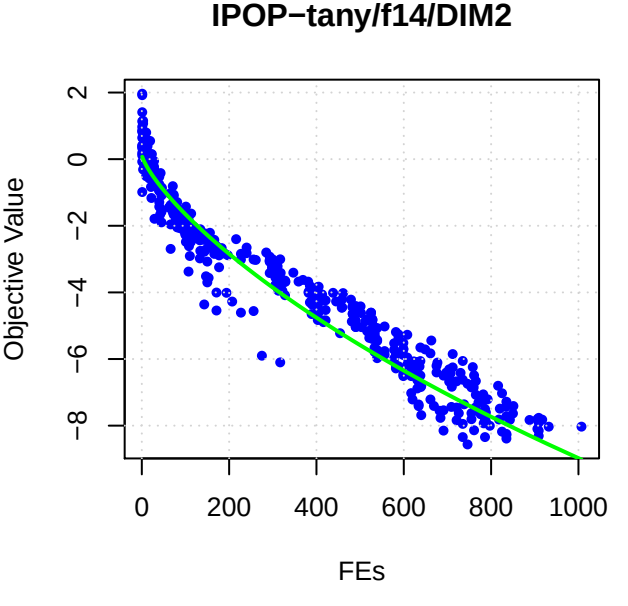
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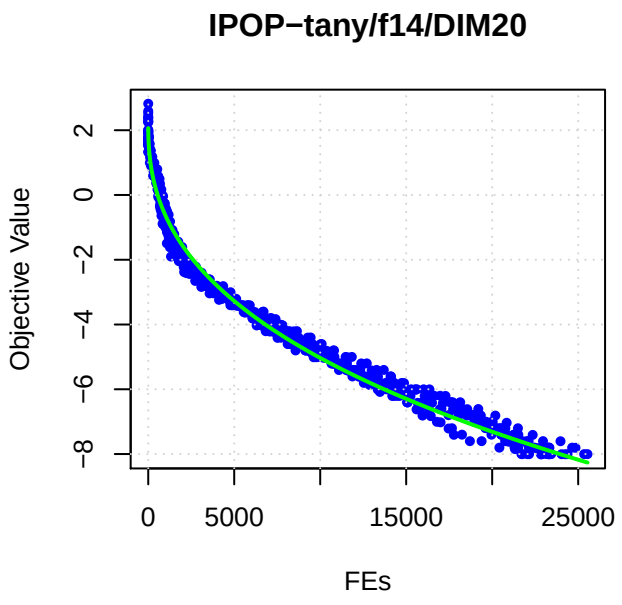
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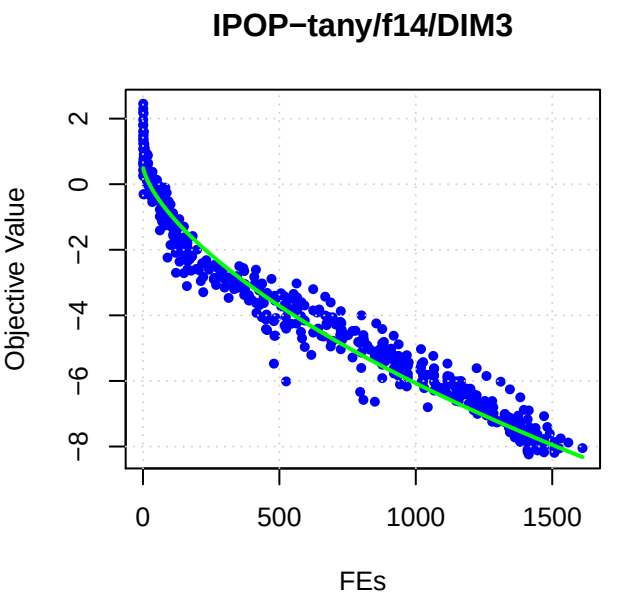
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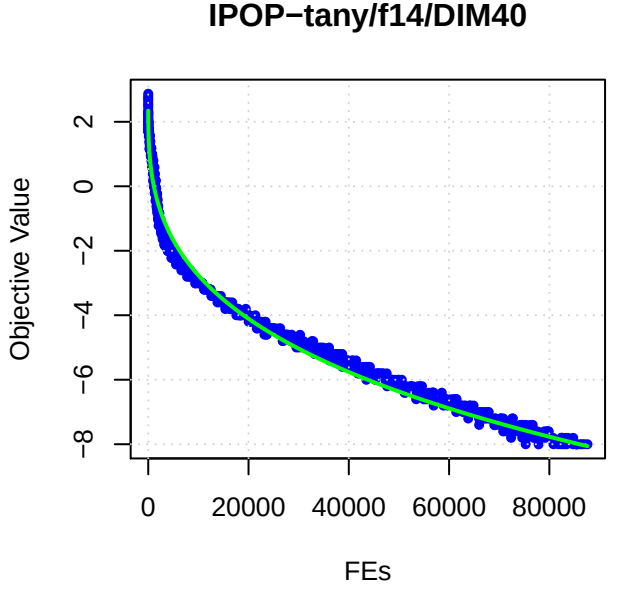
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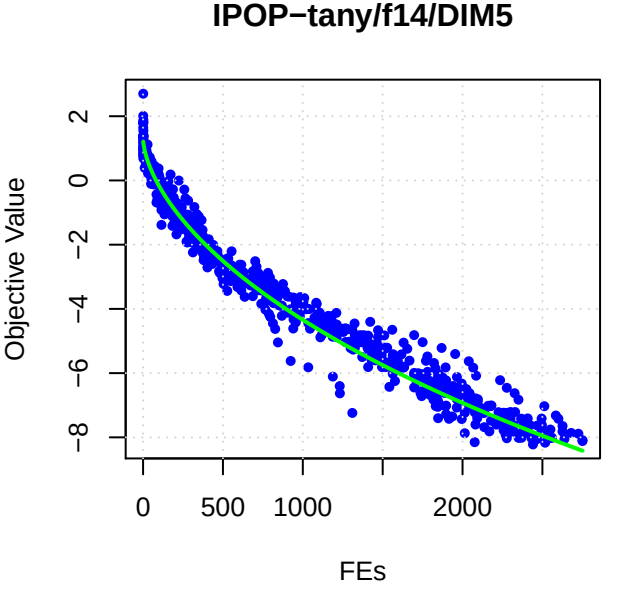
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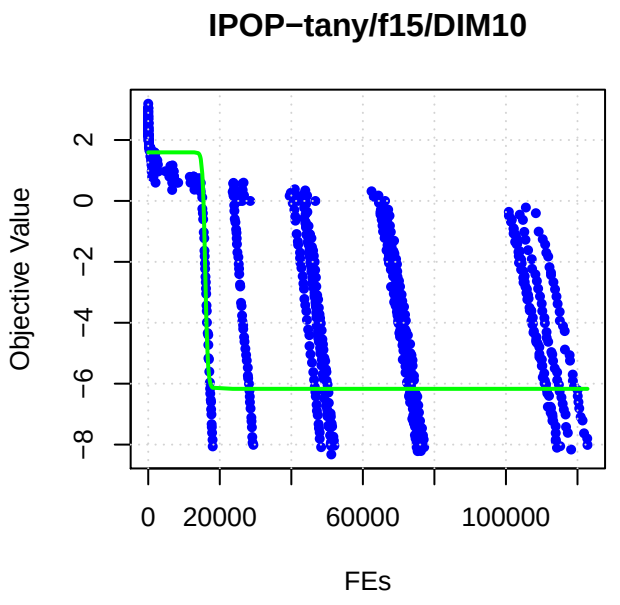
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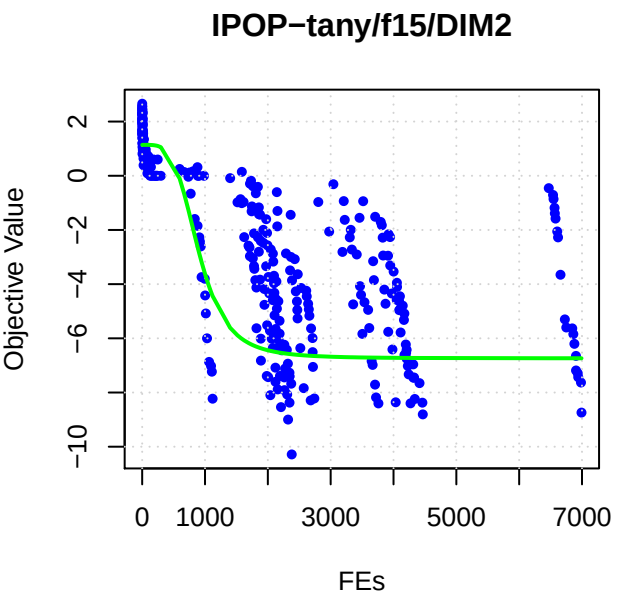
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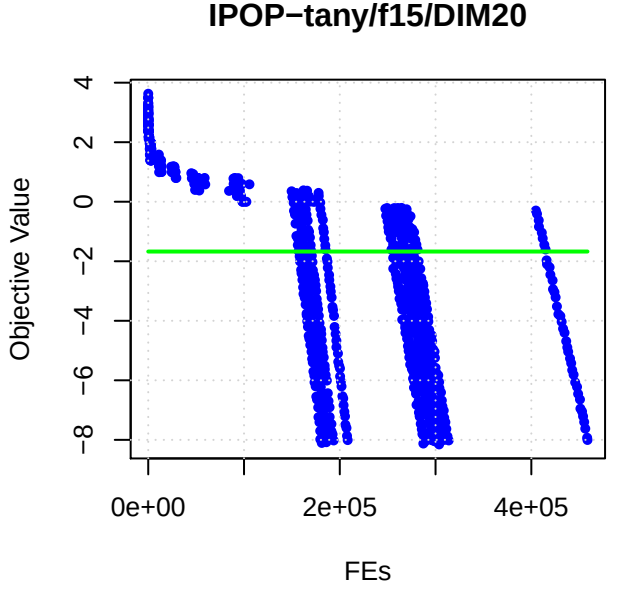
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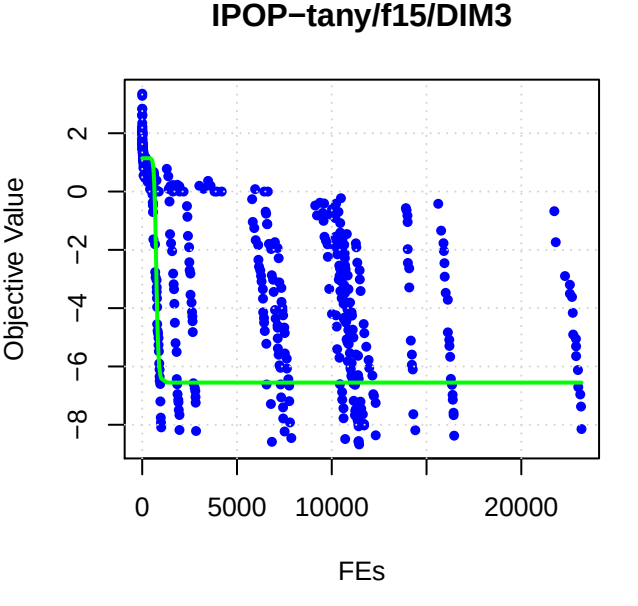
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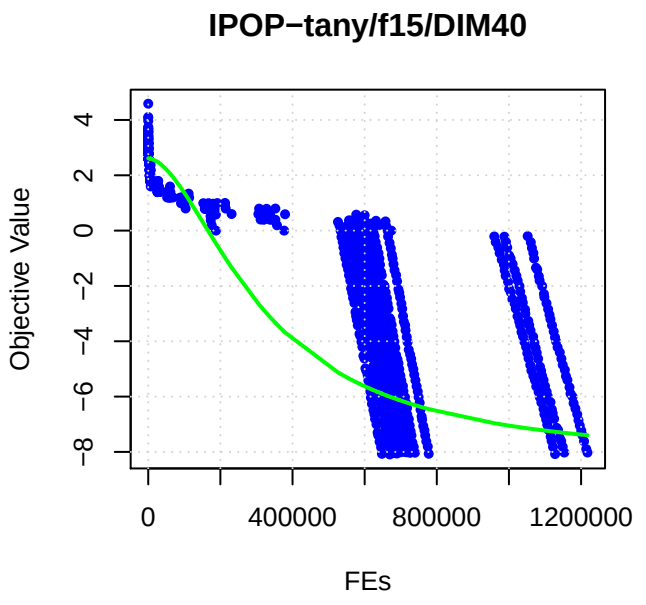
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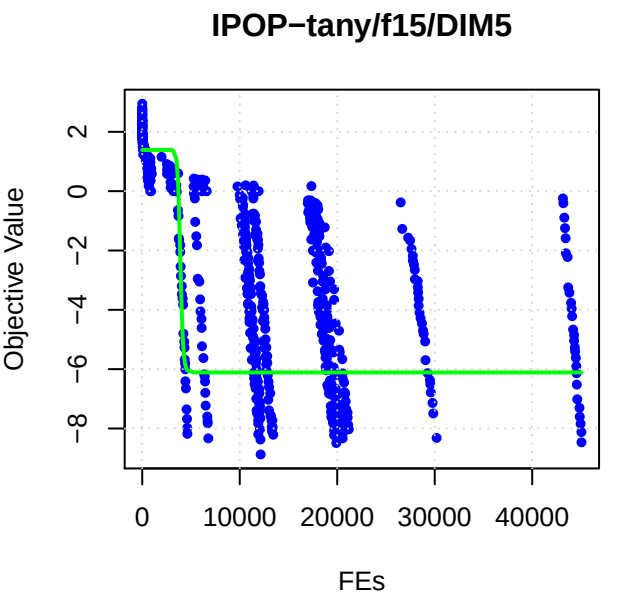
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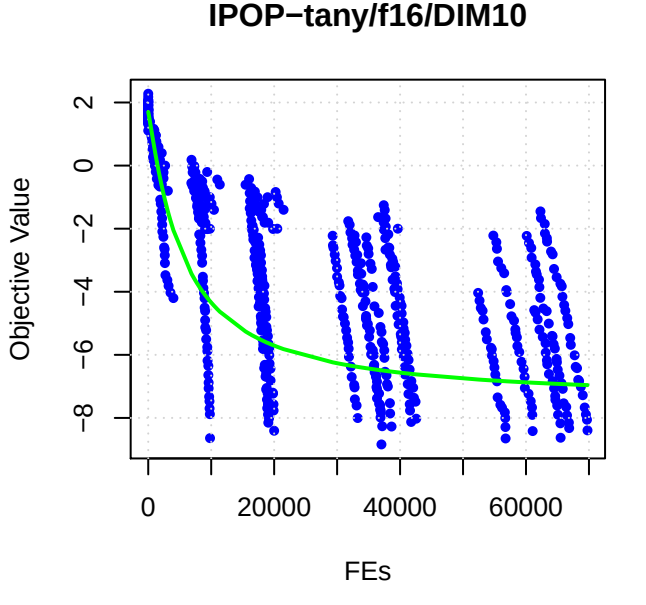
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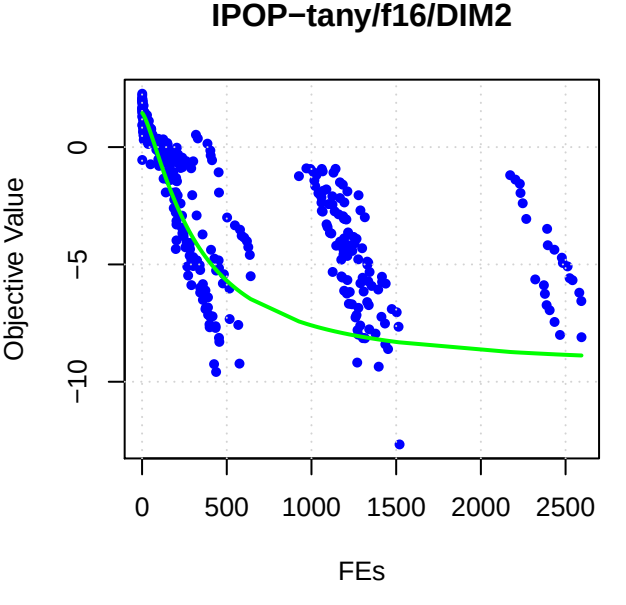
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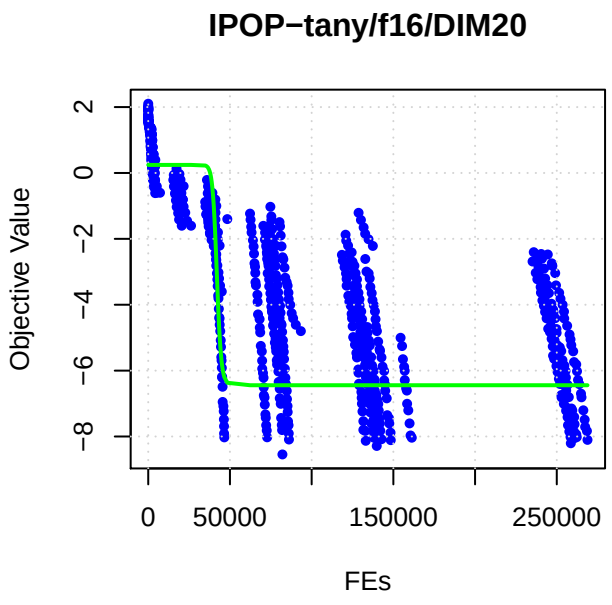
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250000
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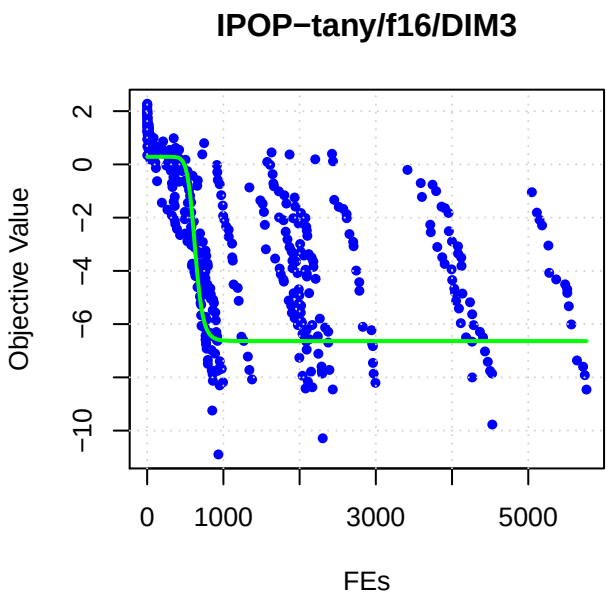
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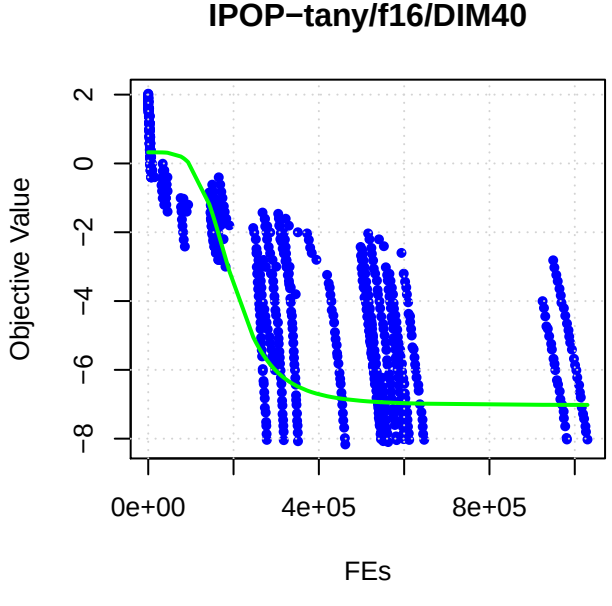
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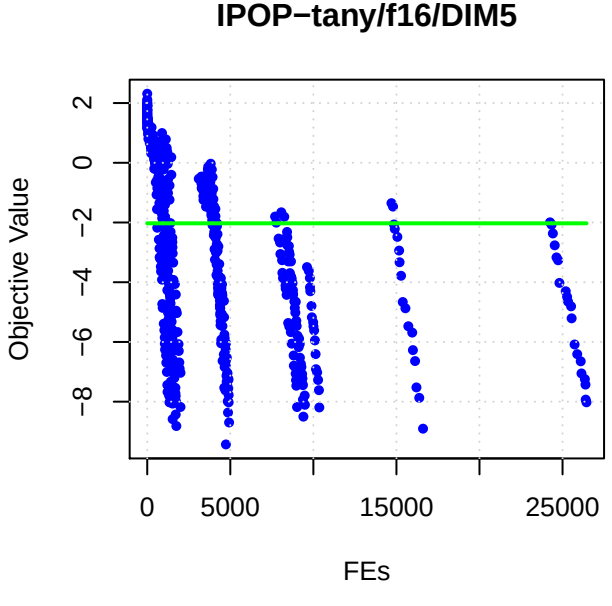
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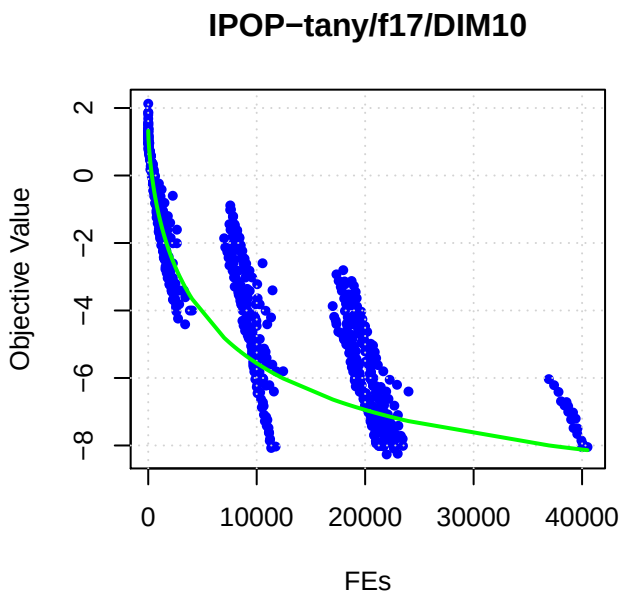
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FEs
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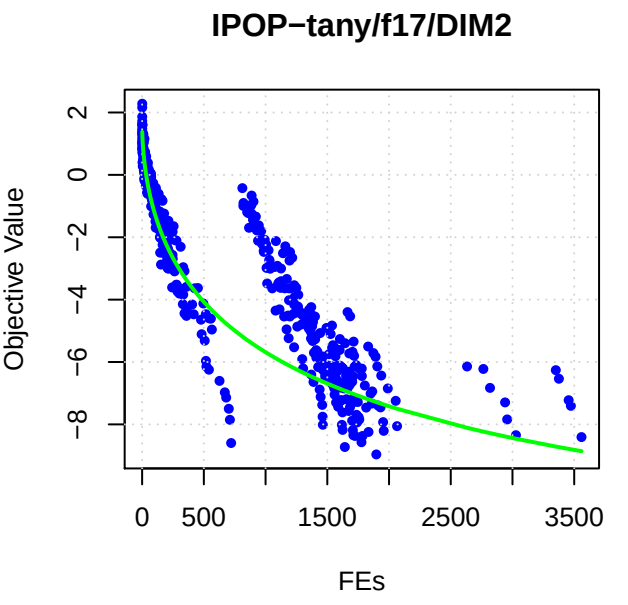
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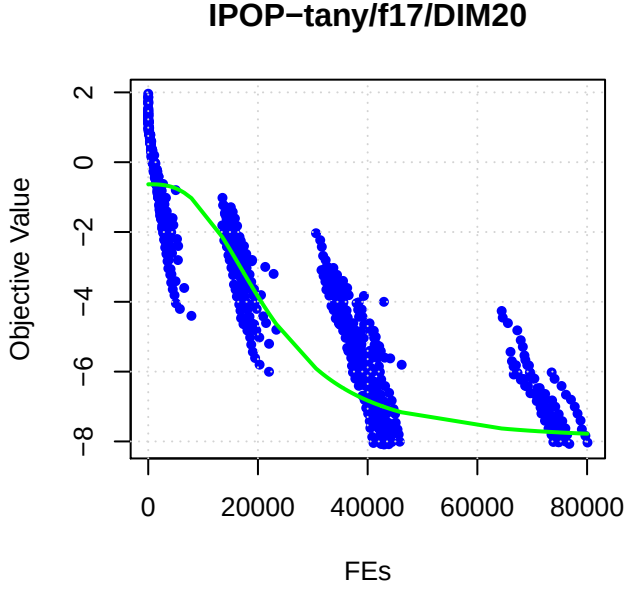
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FEs
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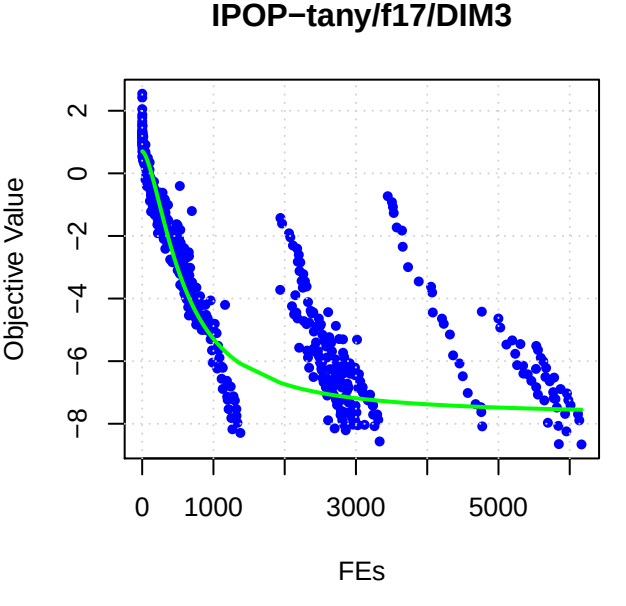
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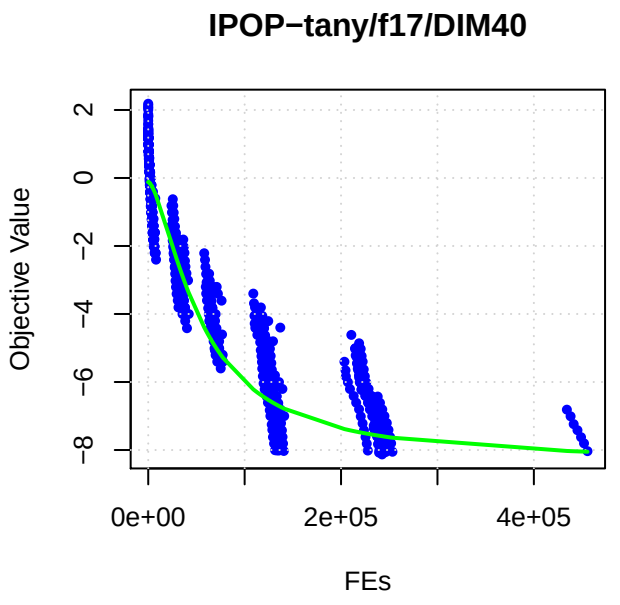
5000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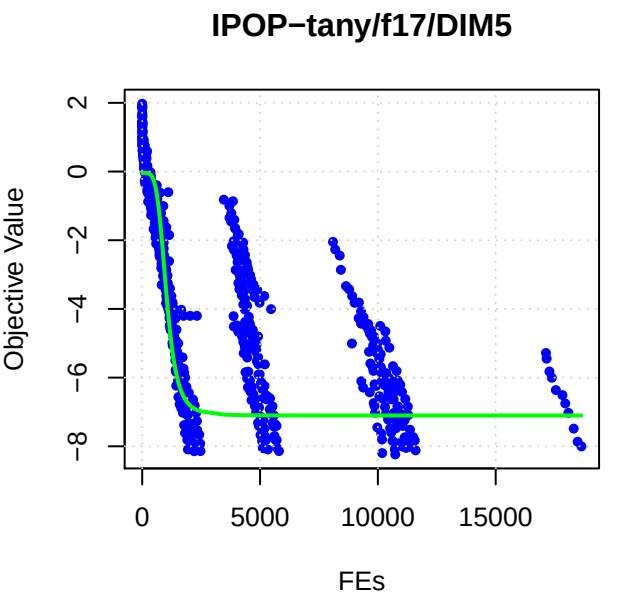
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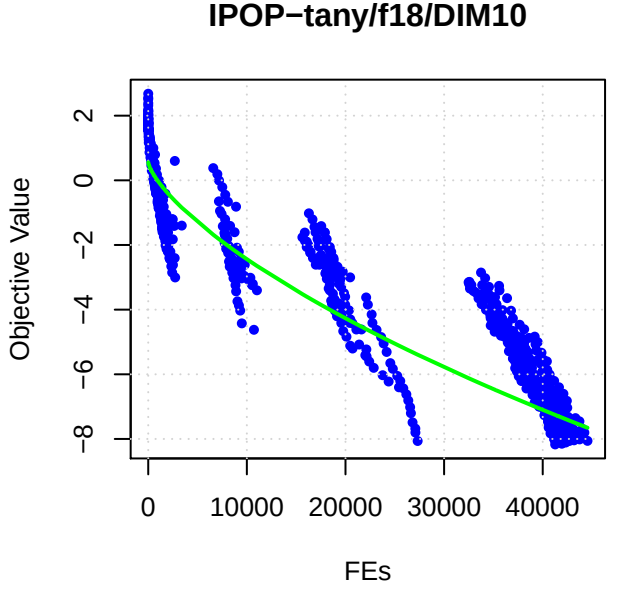
IPOP−tany/f18/DIM10
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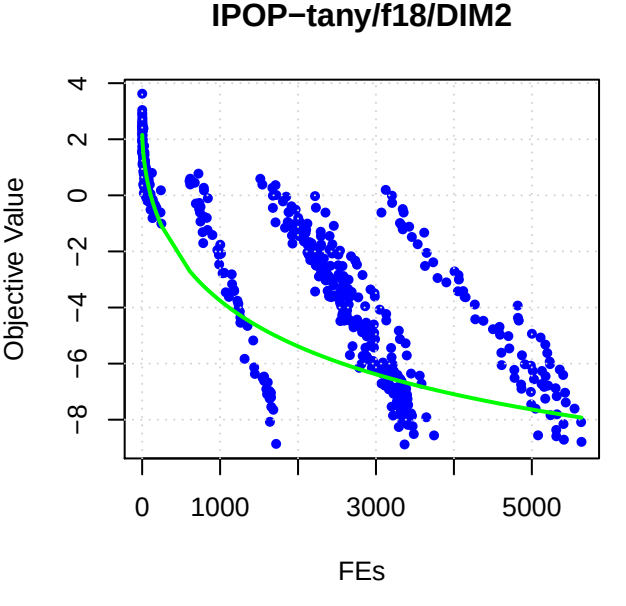
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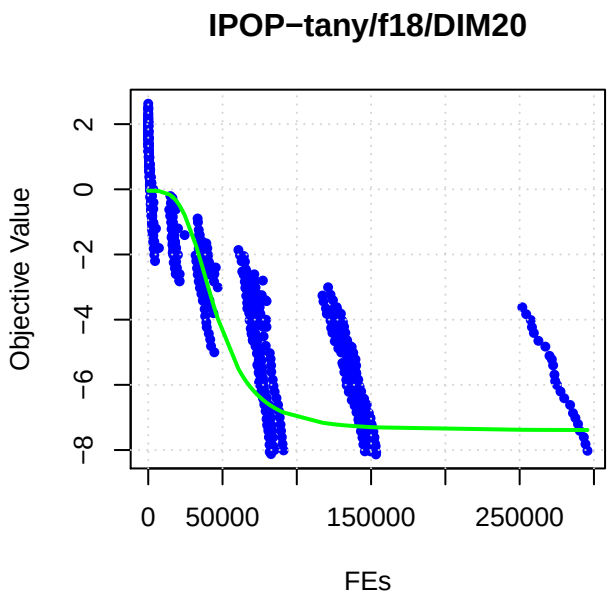
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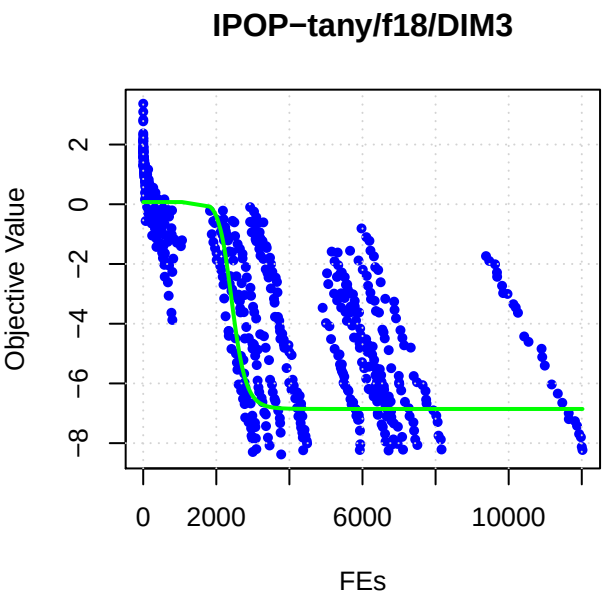
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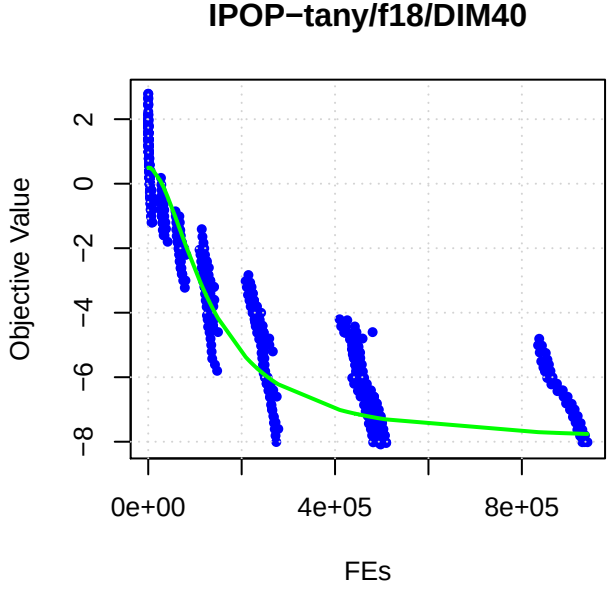
10000
FEs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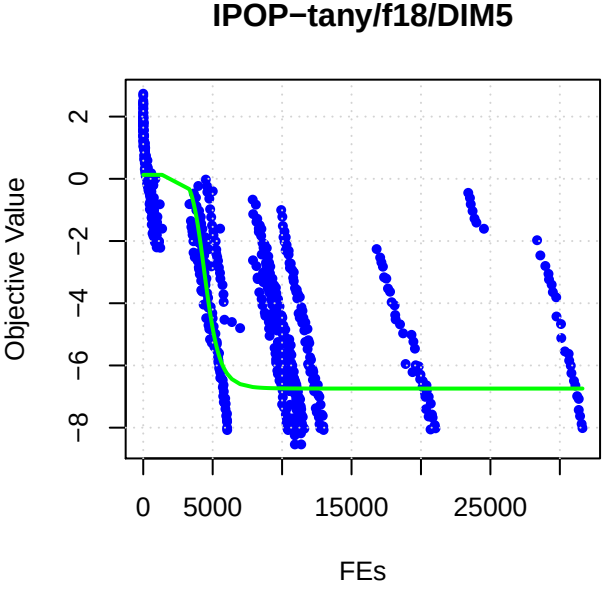
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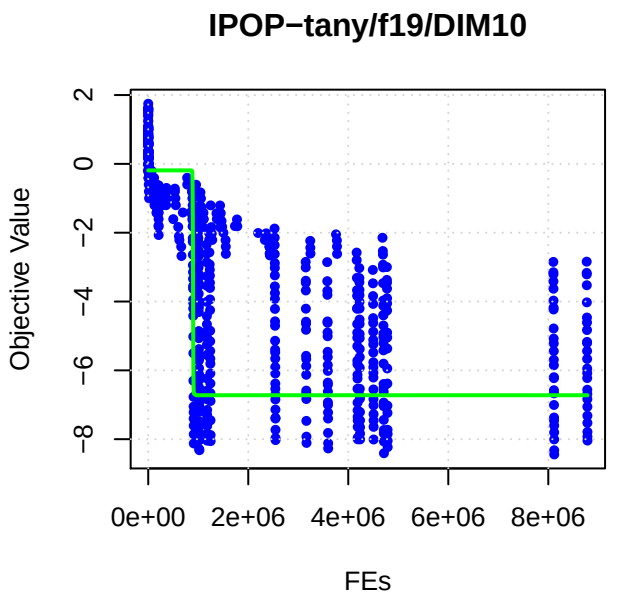
FEs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Objective Value
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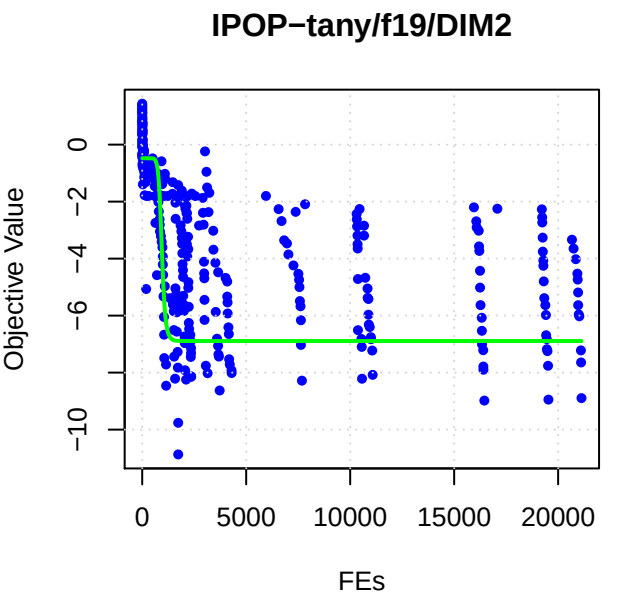
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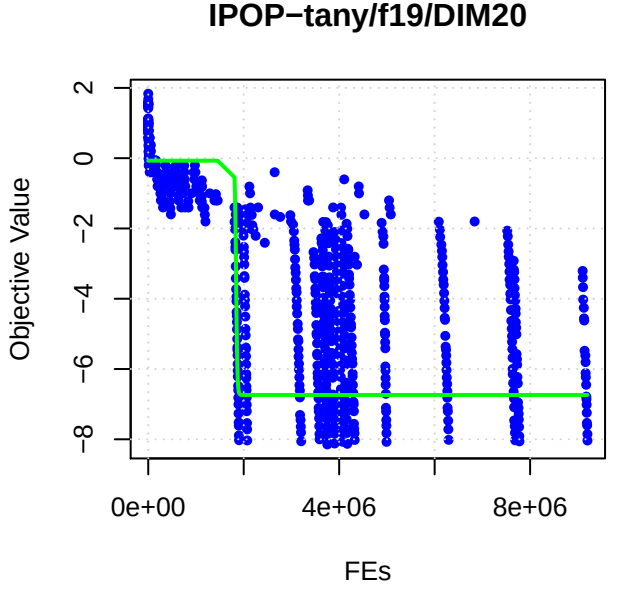
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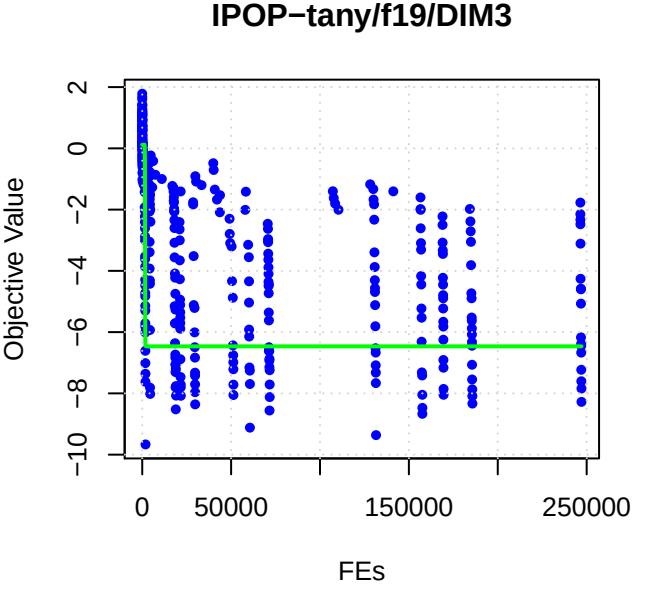
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Objective Value
FEs
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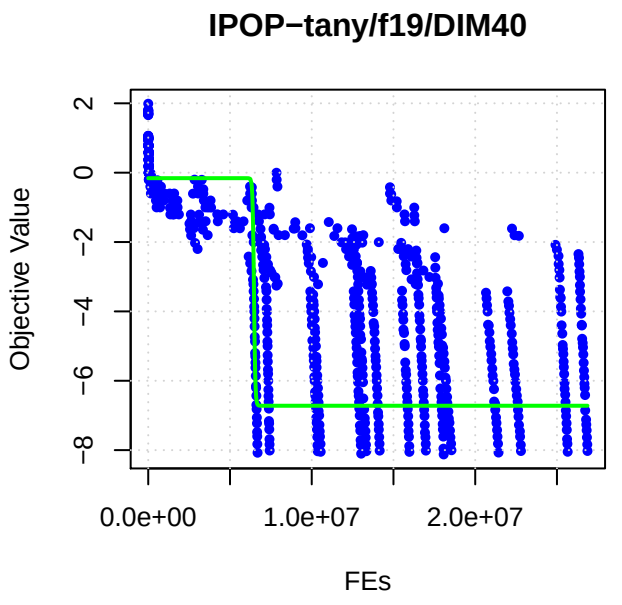
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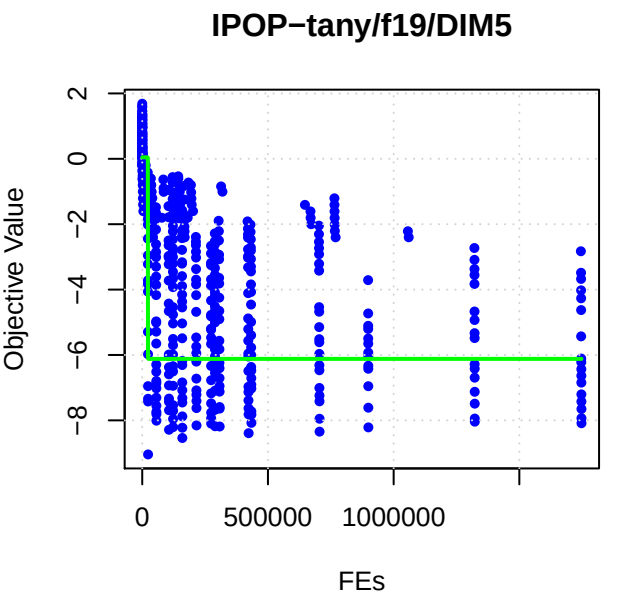
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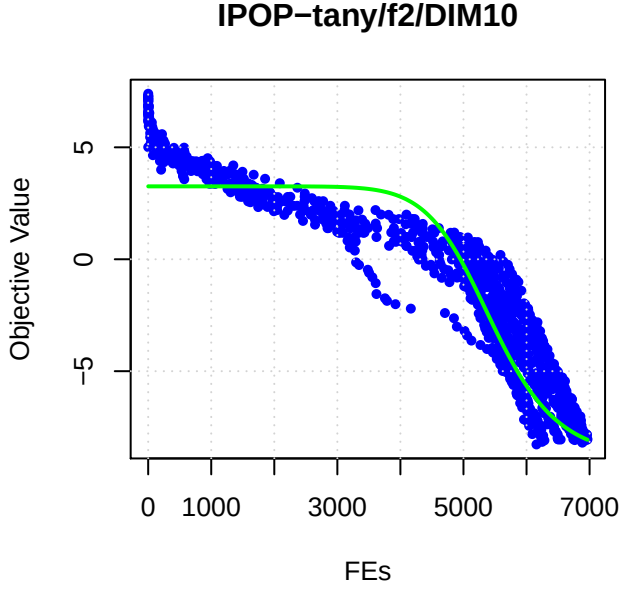
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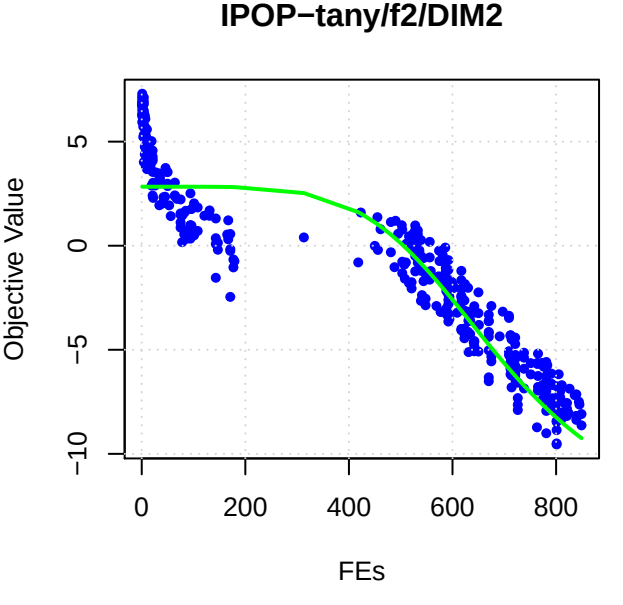
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800
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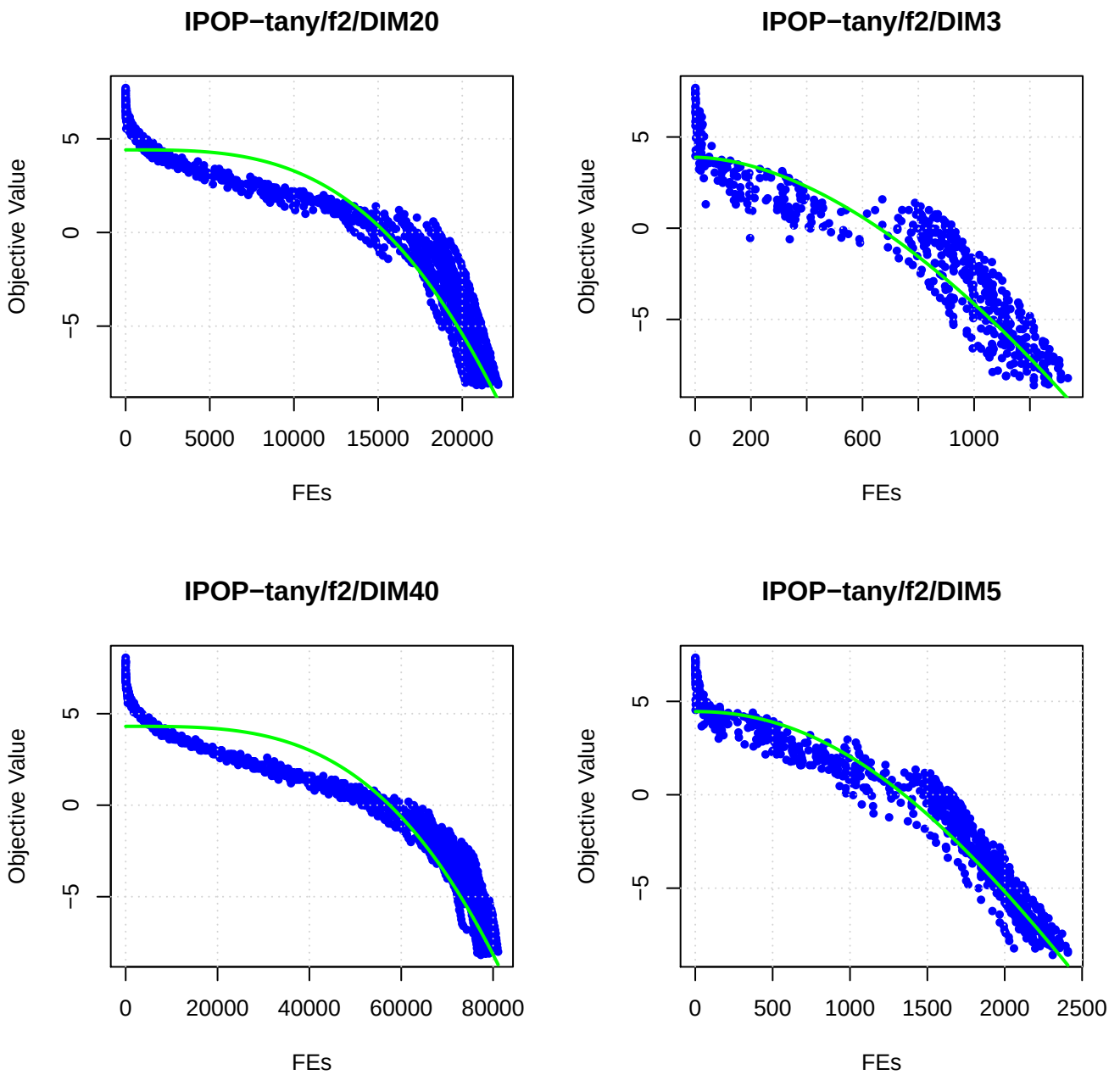
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Objective Value
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15000
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FEs
IPOP−tany/f2/DIM3
Objective Value
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−5
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200
600
1000
FEs
IPOP−tany/f2/DIM40
Objective Value
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20000
40000
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FEs
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Objective Value
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1500
2000
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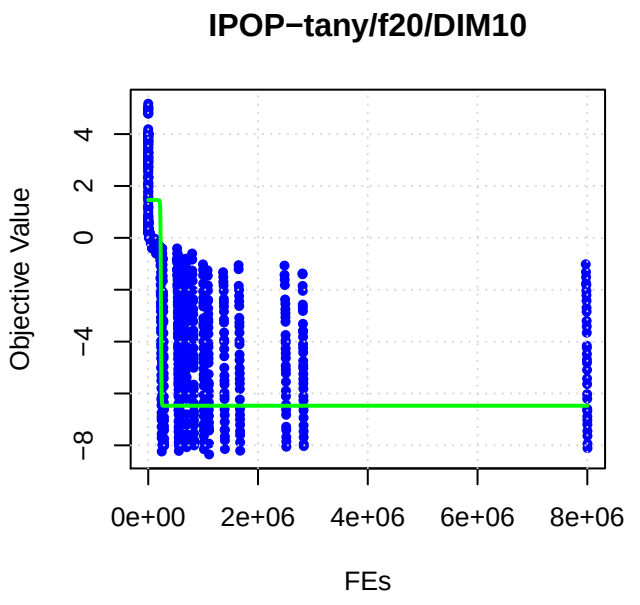
FEs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Objective Value
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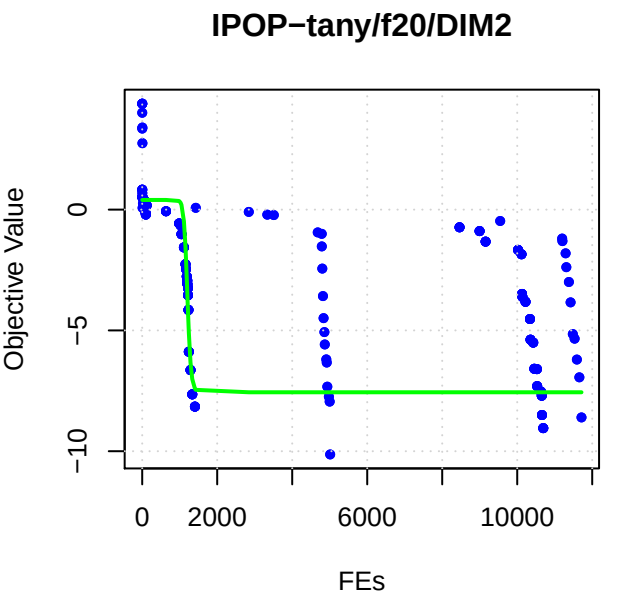
FEs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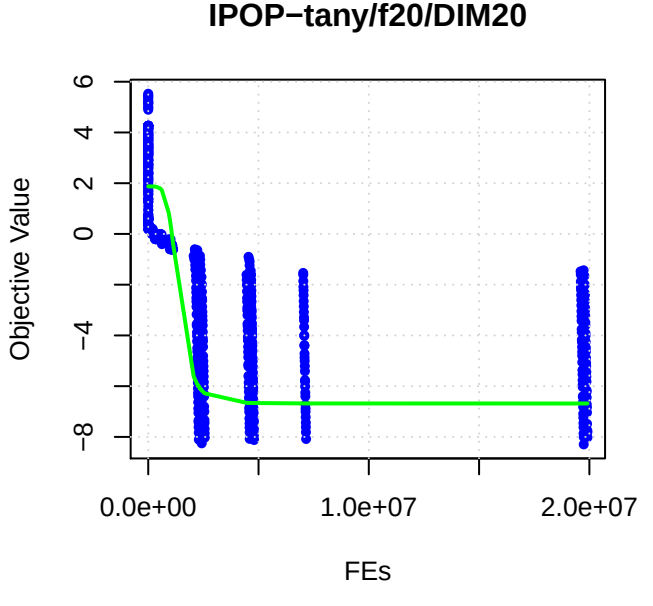
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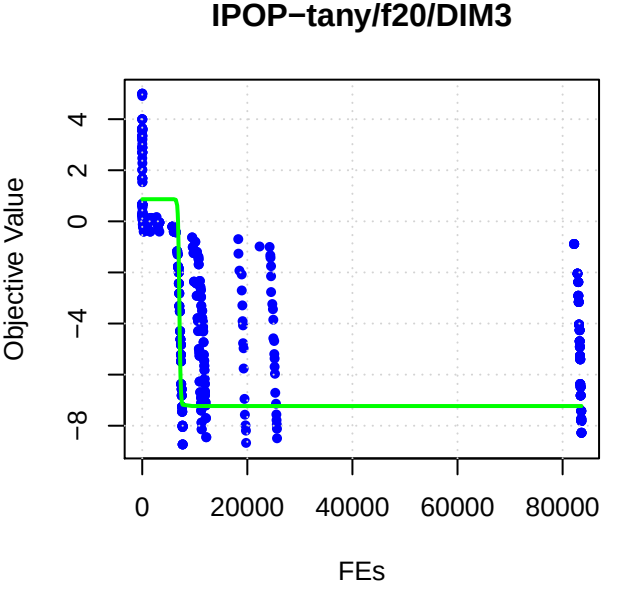
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Objective Value
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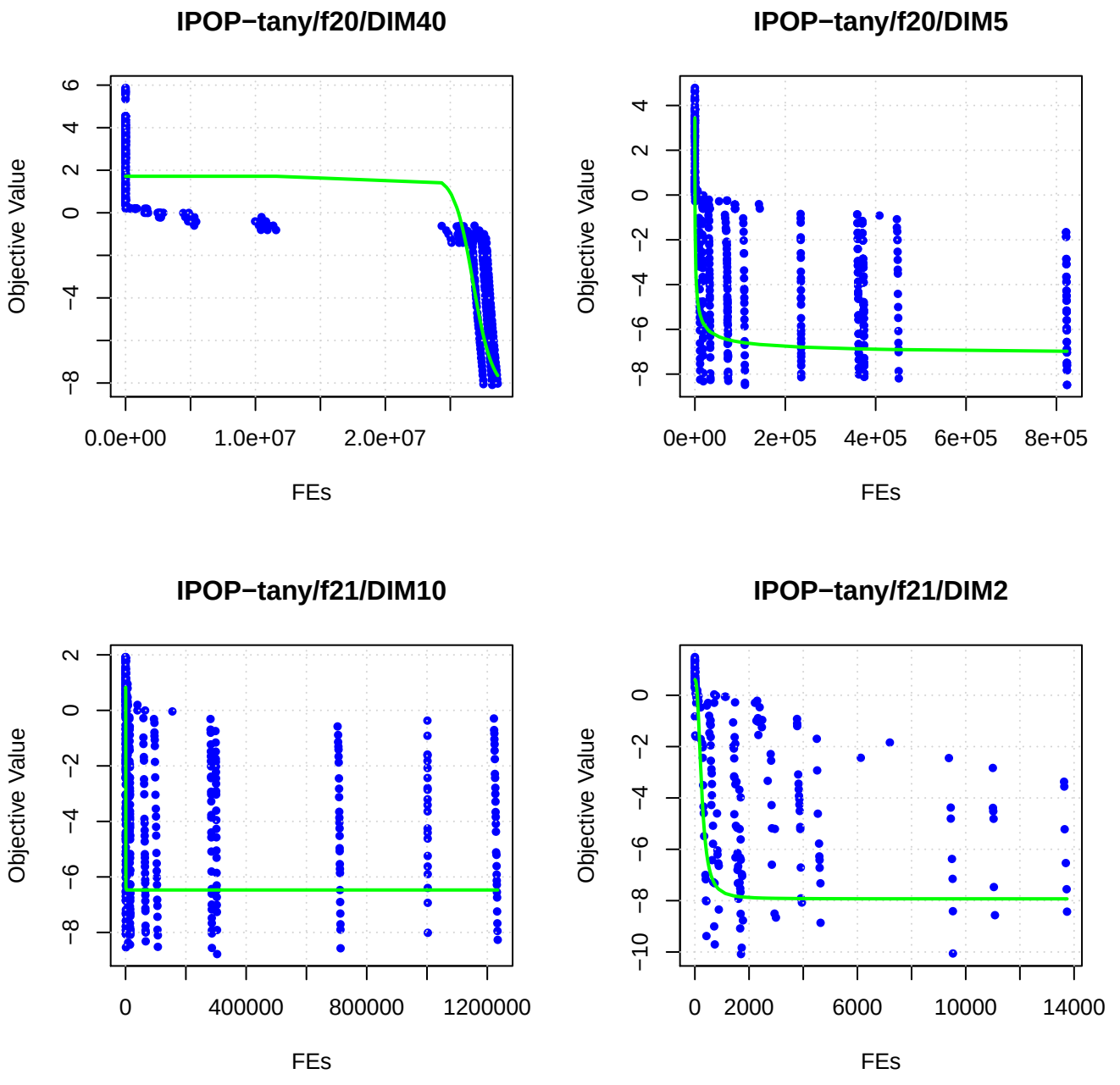
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FEs
IPOP−tany/f20/DIM5
Objective Value
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6e+05
8e+05
FEs
IPOP−tany/f21/DIM10
Objective Value
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FEs
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Objective Value
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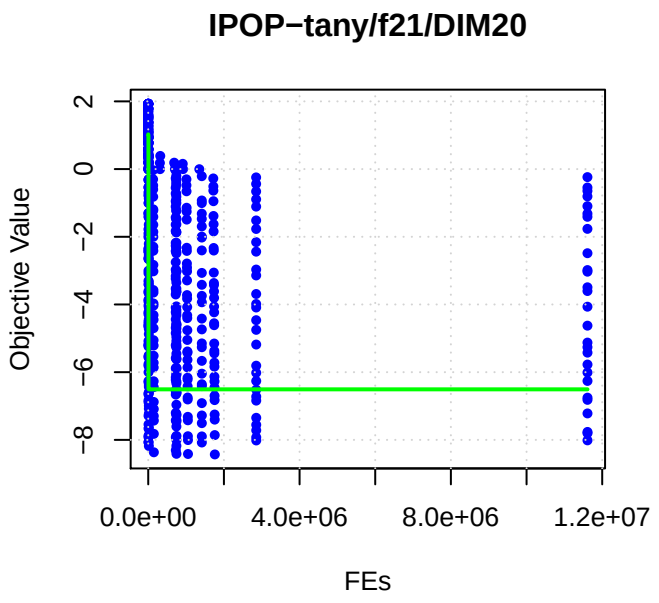
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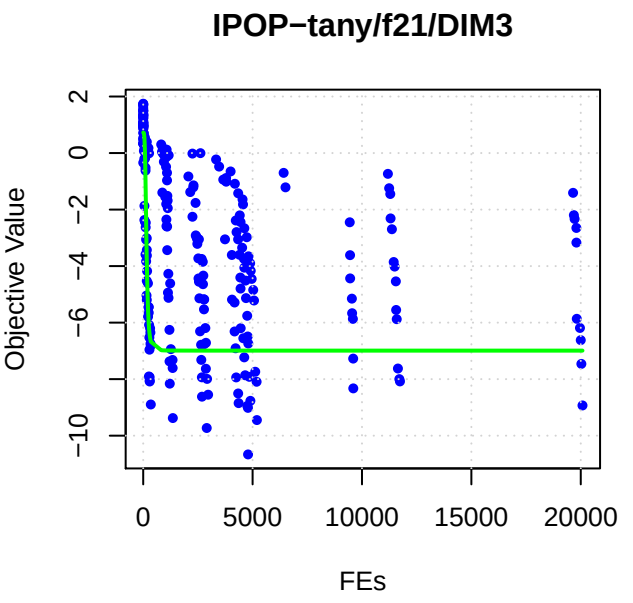
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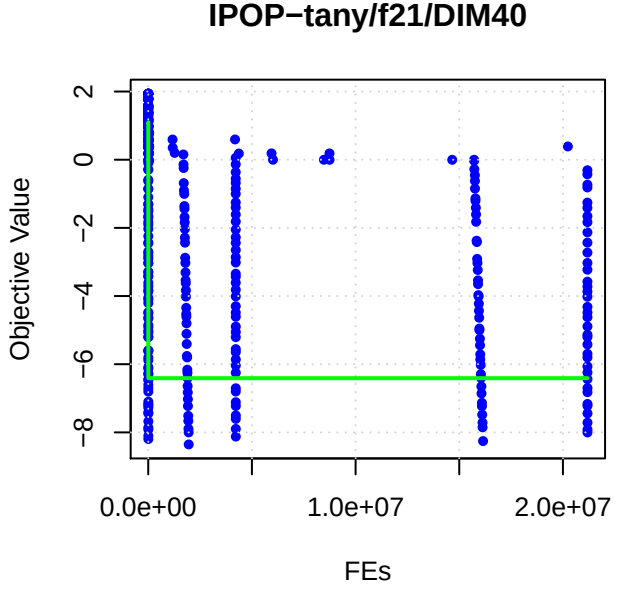
FEs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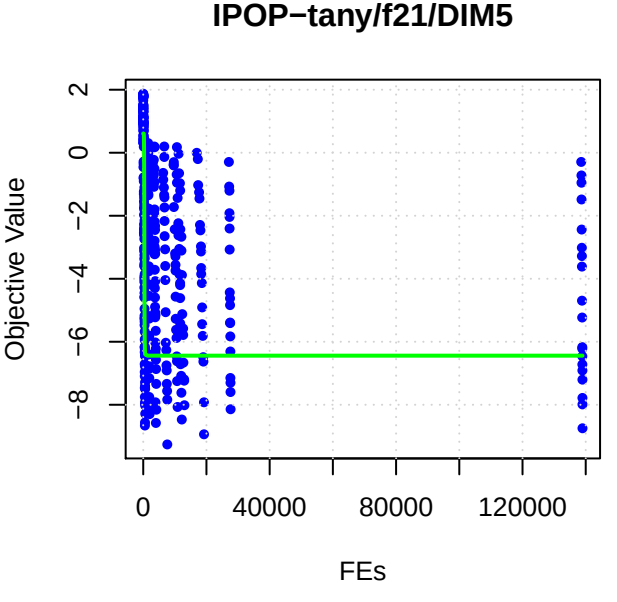
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Objective Value
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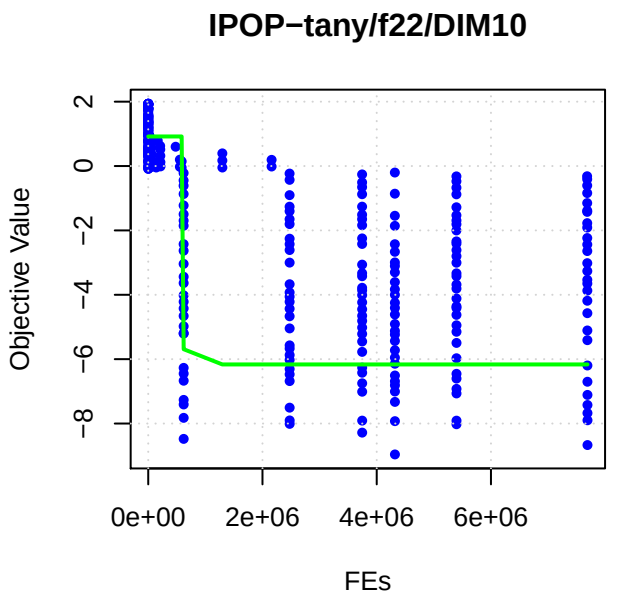
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Objective Value
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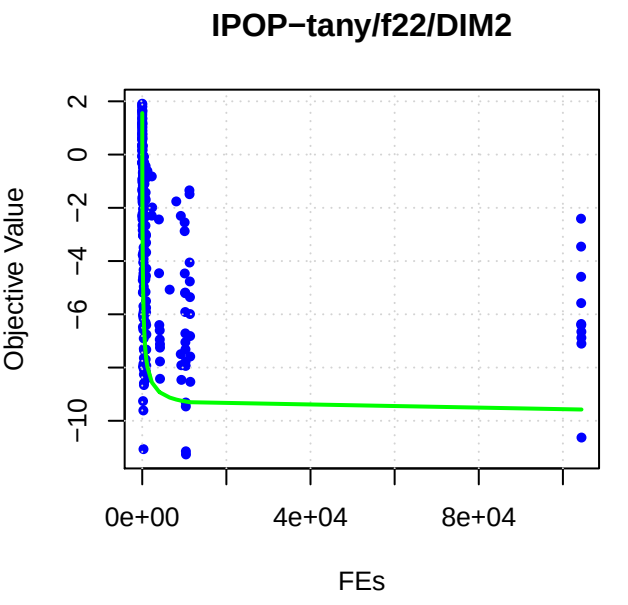
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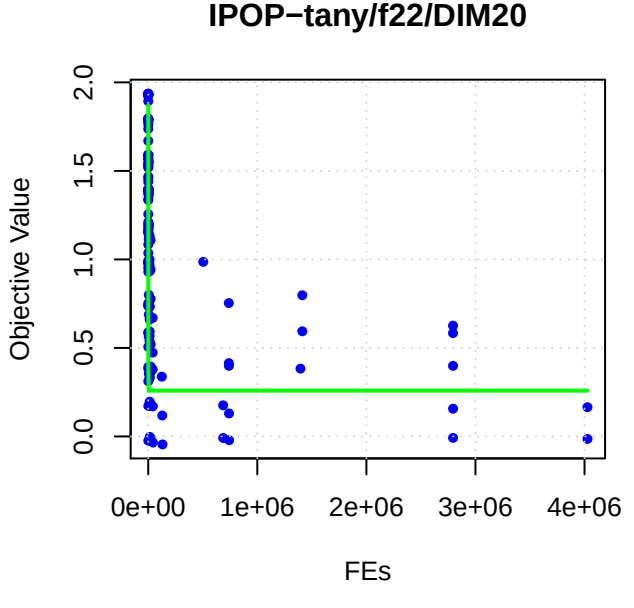
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Objective Value
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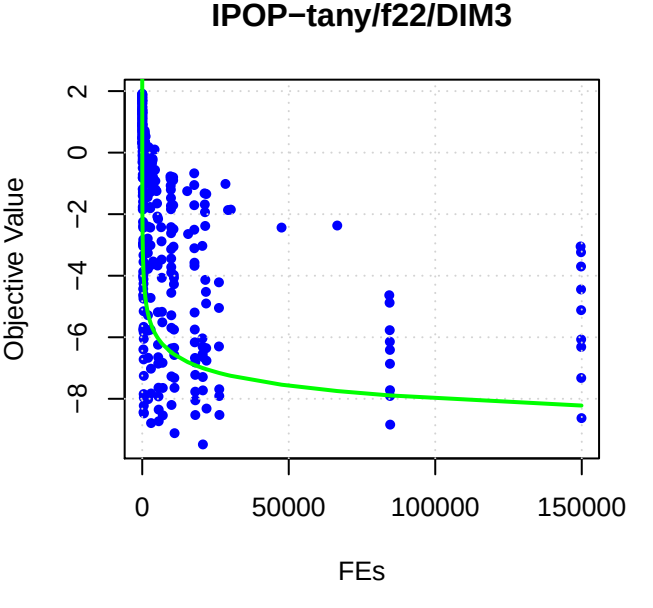
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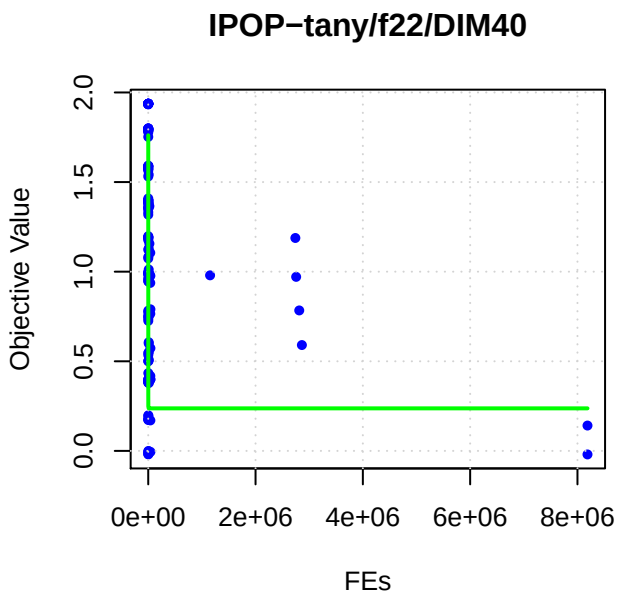
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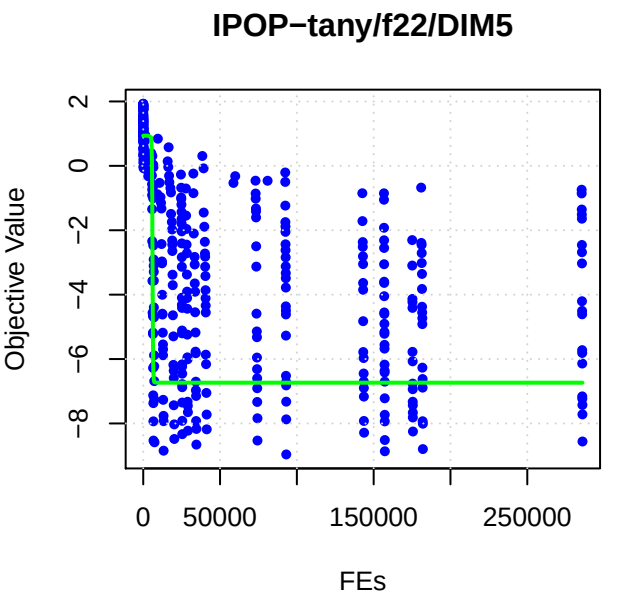
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Objective Value
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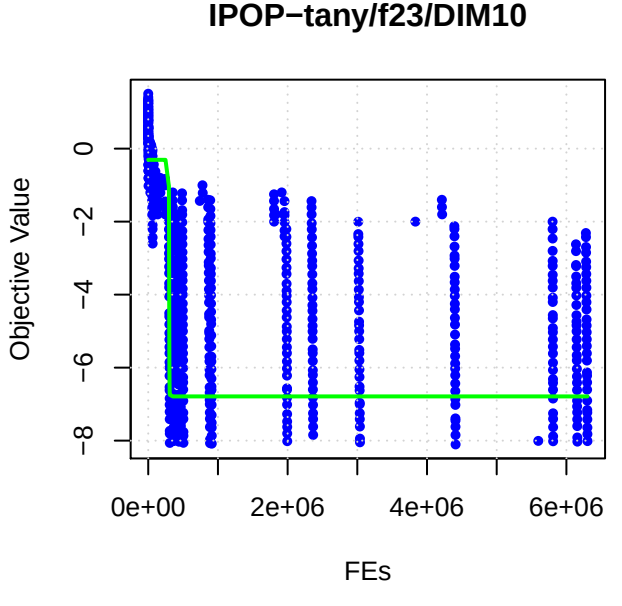
FEs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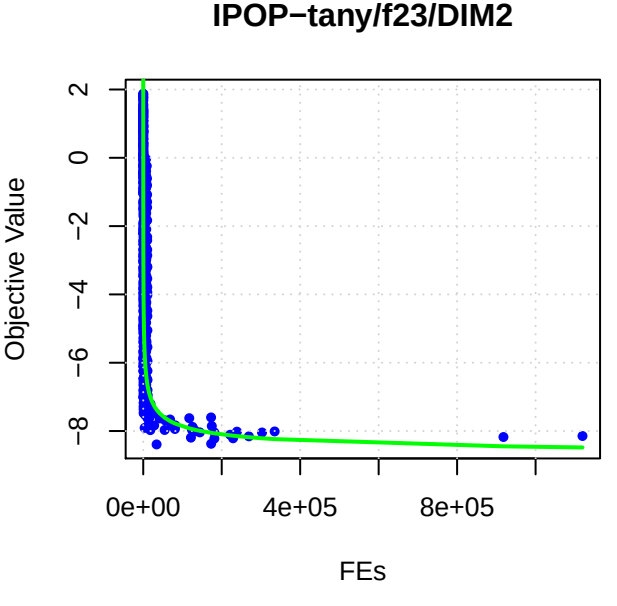
FEs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Objective Value
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−2
−4
−6
−8
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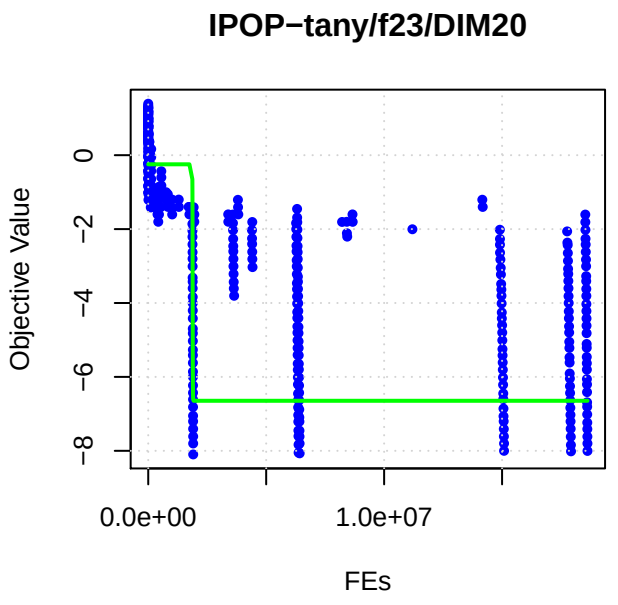
4e+05
8e+05
FEs


IPOP−tany/f23/DIM20
Objective Value
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−4
−6
−8
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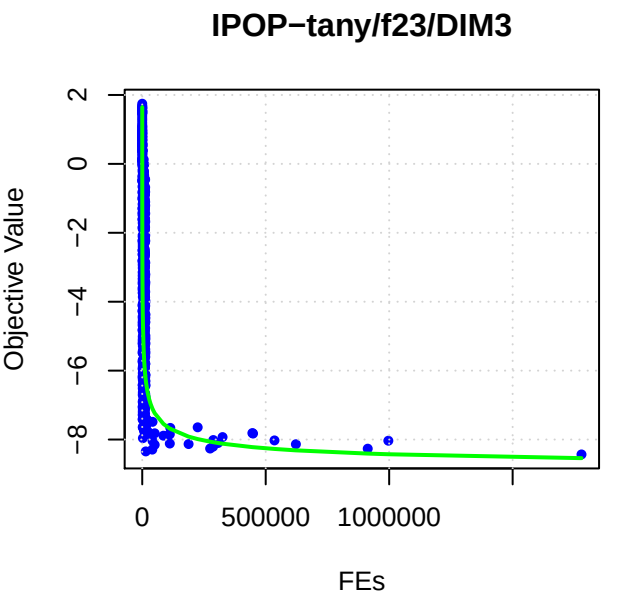
1.0e+07
FEs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Objective Value
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−2
−4
−6
−8
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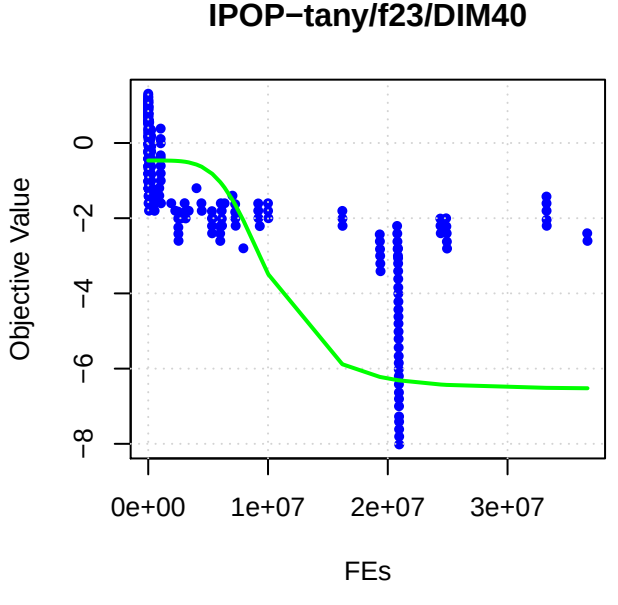
500000
1000000
FEs


IPOP−tany/f23/DIM40
Objective Value
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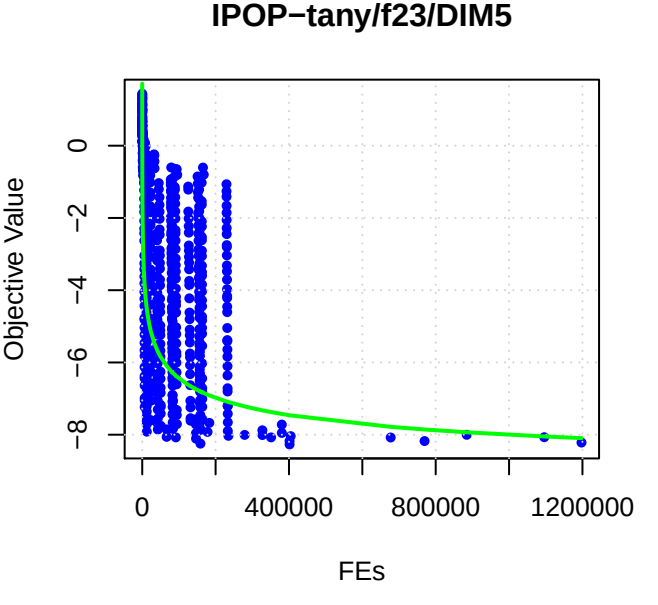
−2
−4
−6
−8
0e+00
1e+07
2e+07
3e+07
FEs


IPOP−tany/f23/DIM5
Objective Value
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−4
−6
−8
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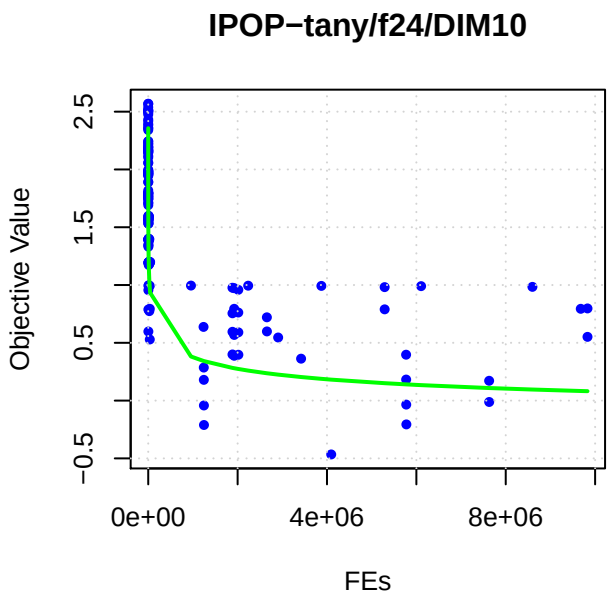
800000
1200000
FEs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Objective Value
FEs
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1.5
0.5
−0.5
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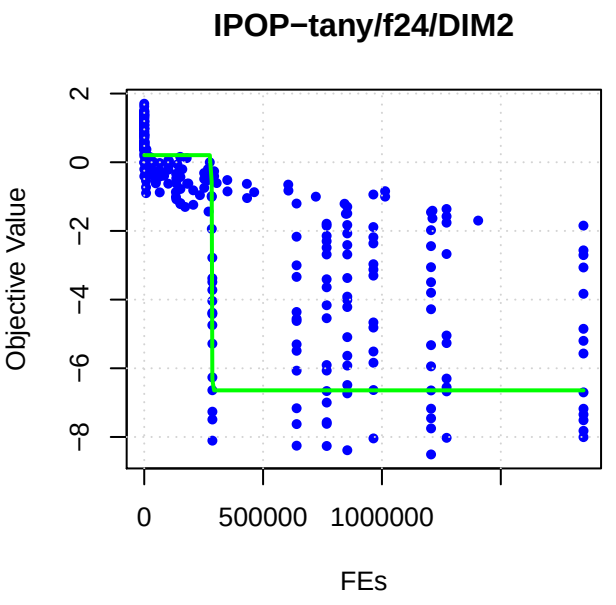
4e+06
8e+06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Objective Value
FEs
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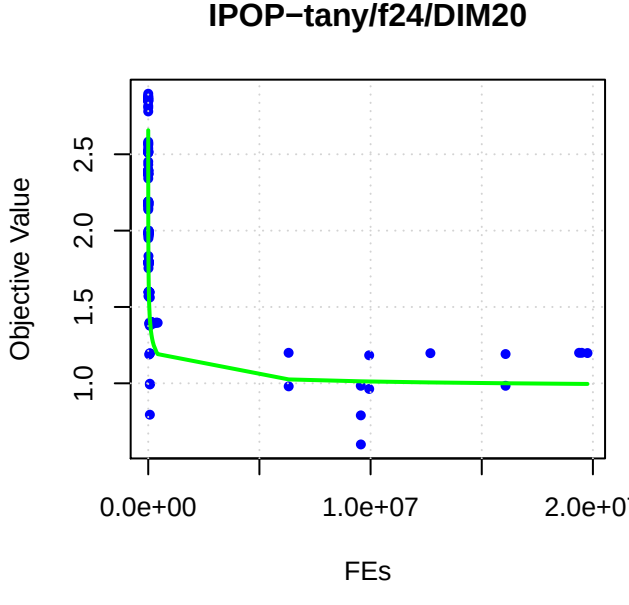
−4
−6
−8
0
500000
1000000


IPOP−tany/f24/DIM20
Objective Value
FEs
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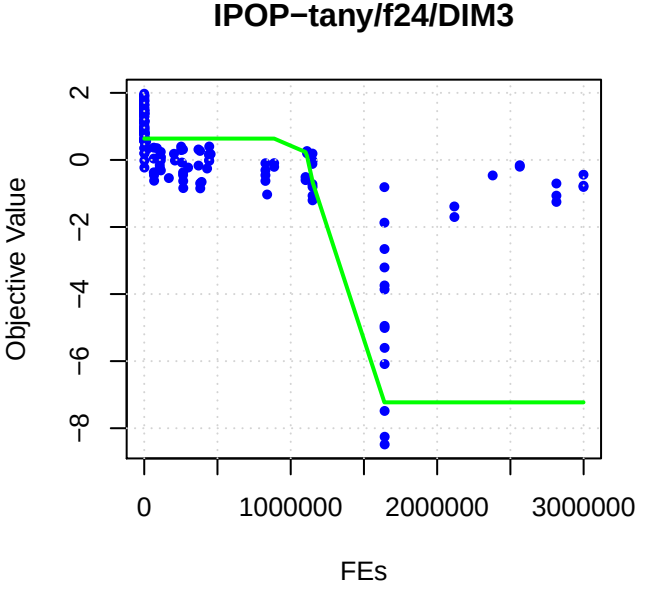
2.0
1.5
1.0
0.0e+00
1.0e+07
2.0e+07


IPOP−tany/f24/DIM3
Objective Value
FEs
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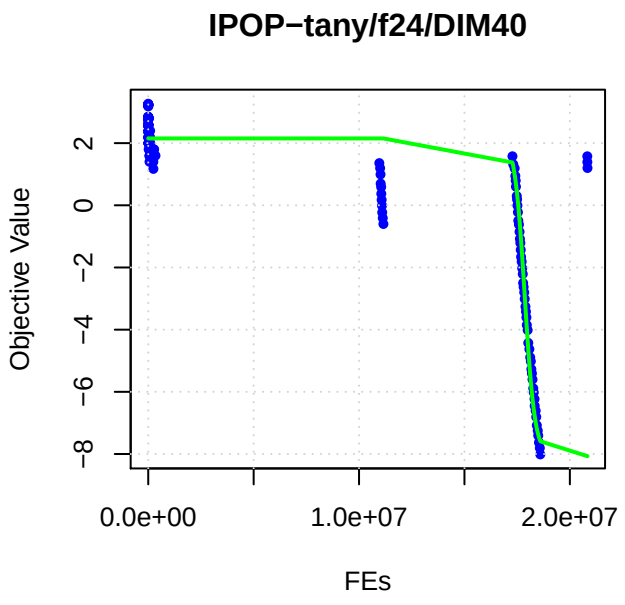
−2
−4
−6
−8
0
1000000
2000000
3000000


IPOP−tany/f24/DIM40
Objective Value
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−2
−4
−6
−8
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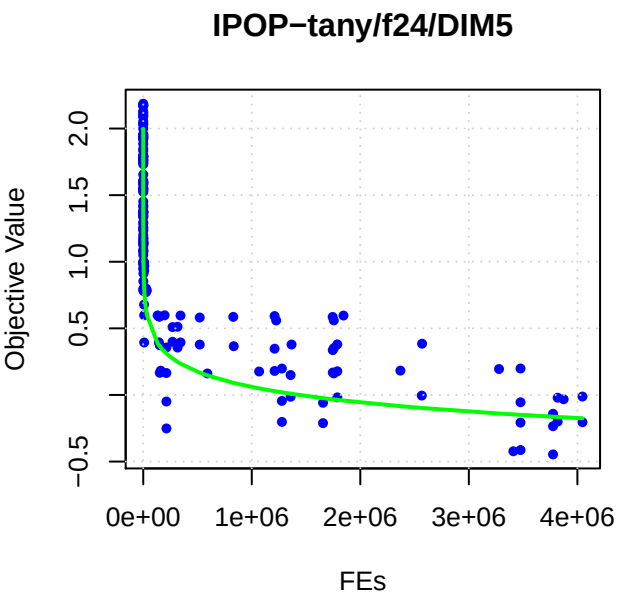
1.0e+07
2.0e+07
FEs


IPOP−tany/f24/DIM5
Objective Value
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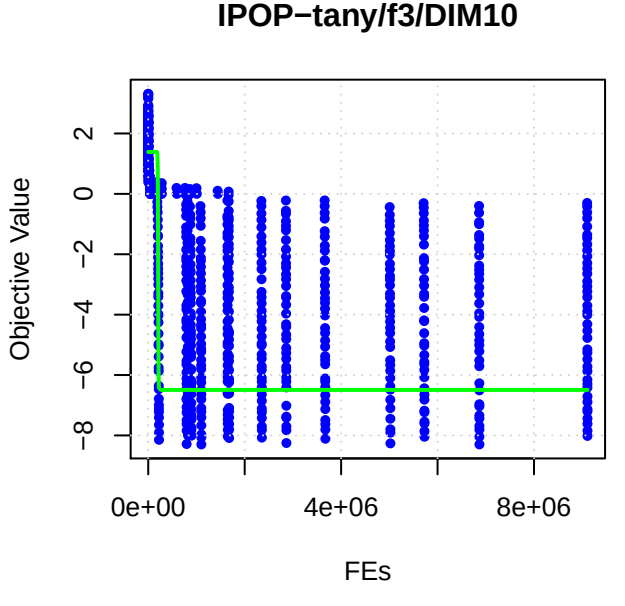
1.5
1.0
0.5
−0.5
0e+00
1e+06
2e+06
3e+06
4e+06
FEs


IPOP−tany/f3/DIM10
Objective Value
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−2
−4
−6
−8
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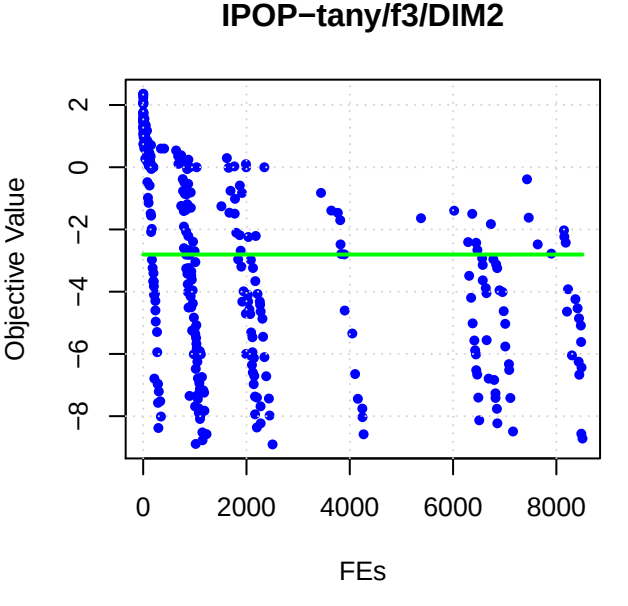
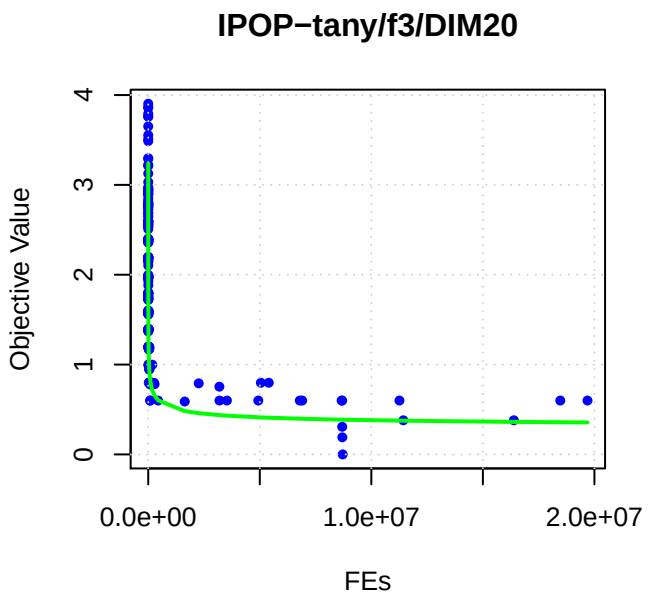
4e+06
8e+06
FEs


IPOP−tany/f3/DIM2
Objective Value
2
0
−2
−4
−6
−8
0
2000
4000
6000
8000
FEs


IPOP−tany/f3/DIM20
Objective Value
FEs
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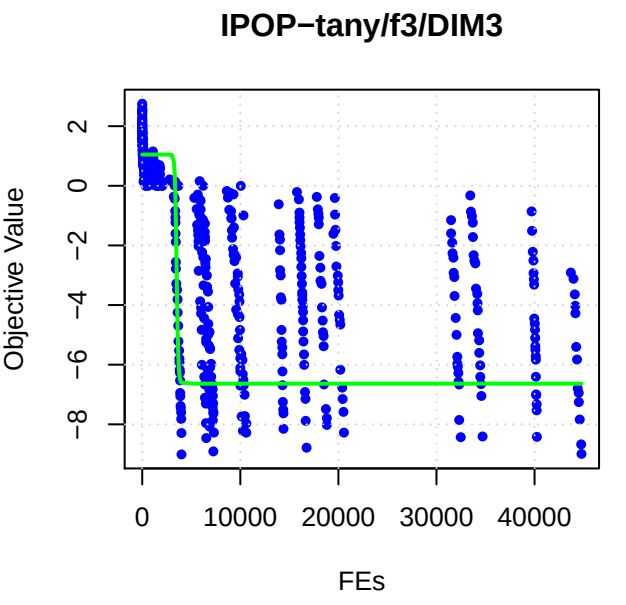
1
2
3
4
0.0e+00
1.0e+07
2.0e+07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Objective Value
FEs
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−2
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−6
−8
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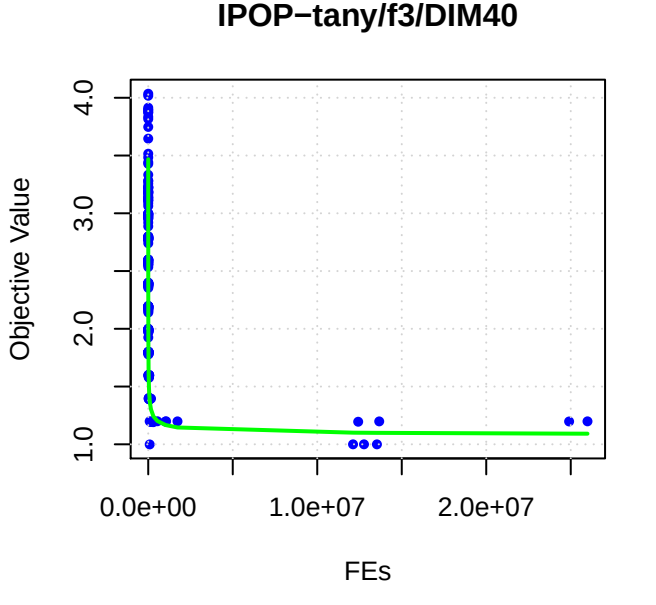
30000
40000


IPOP−tany/f3/DIM40
Objective Value
FEs
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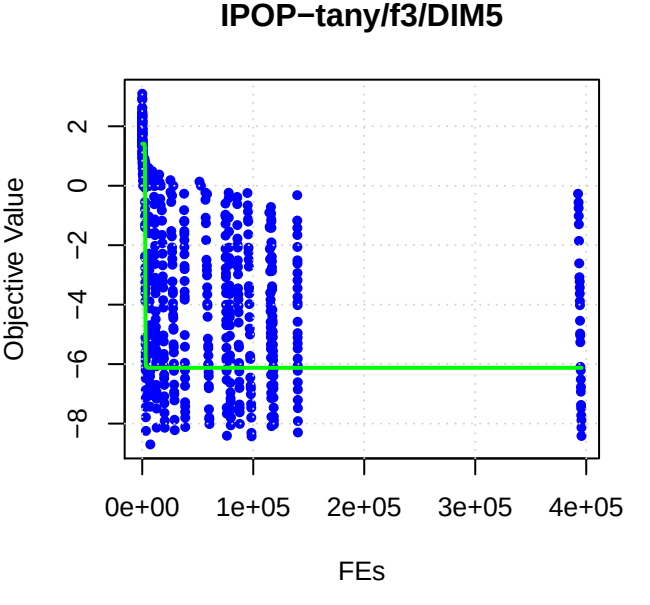
2.0
3.0
4.0
0.0e+00
1.0e+07
2.0e+07


IPOP−tany/f3/DIM5
Objective Value
FEs
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−2
−4
−6
−8
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1e+05
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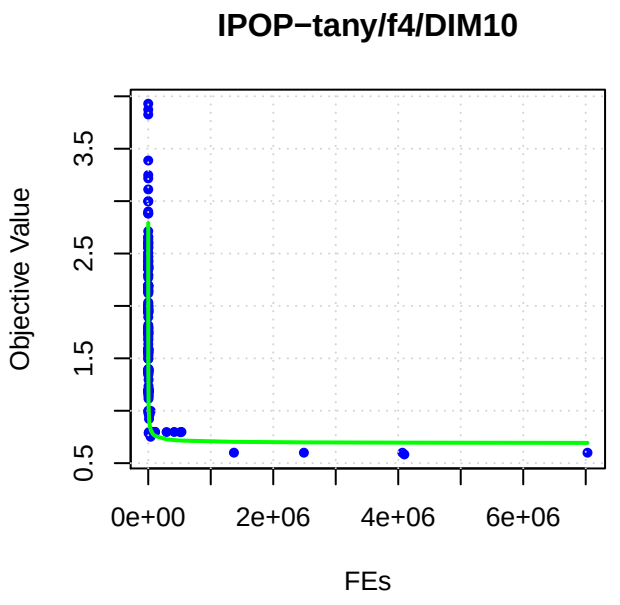
3e+05
4e+05


IPOP−tany/f4/DIM10
Objective Value
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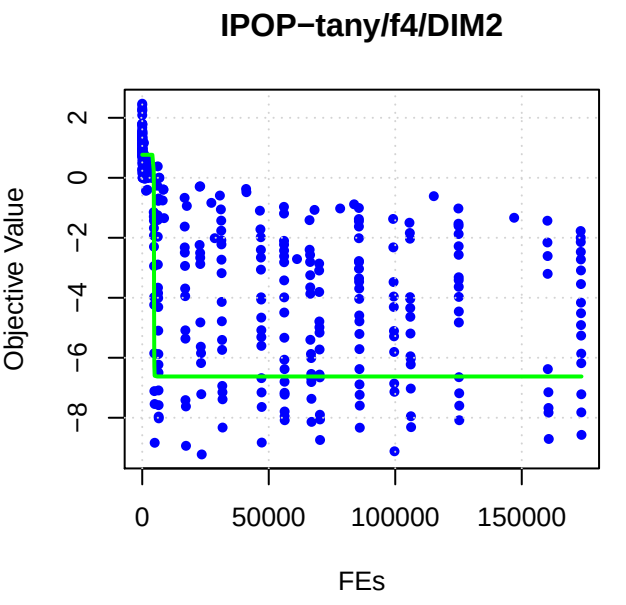
1.5
2.5
3.5
0e+00
2e+06
4e+06
6e+06
FEs


IPOP−tany/f4/DIM2
Objective Value
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−2
−4
−6
−8
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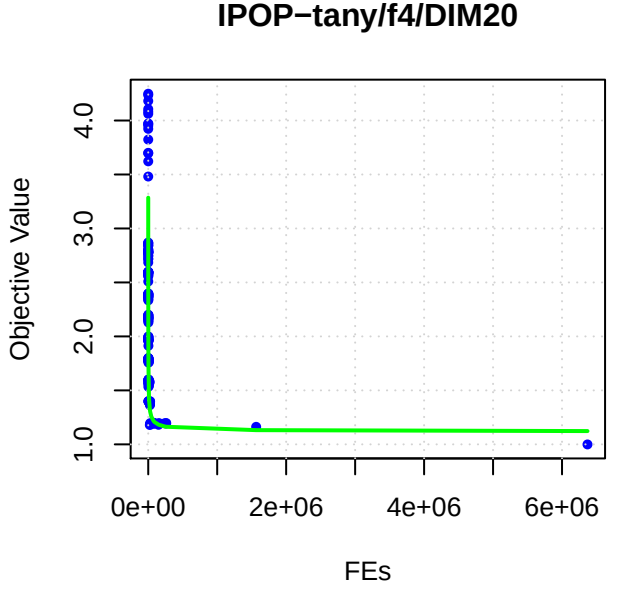
50000
100000
150000
FEs


IPOP−tany/f4/DIM20
Objective Value
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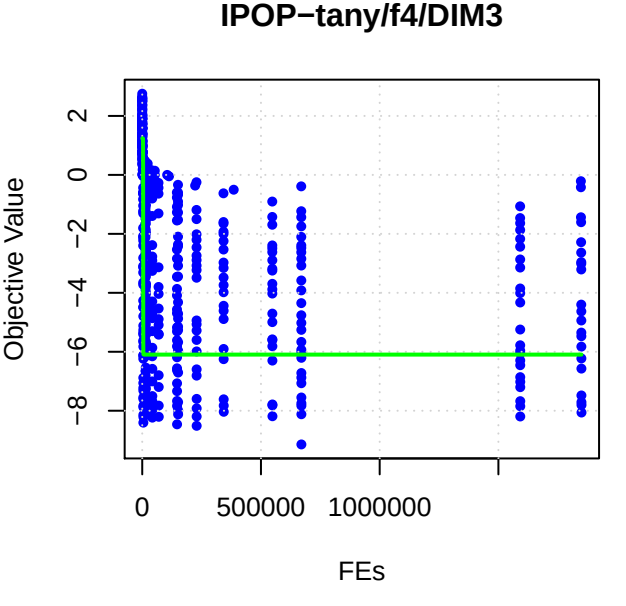
2.0
3.0
4.0
0e+00
2e+06
4e+06
6e+06
FEs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Objective Value
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−2
−4
−6
−8
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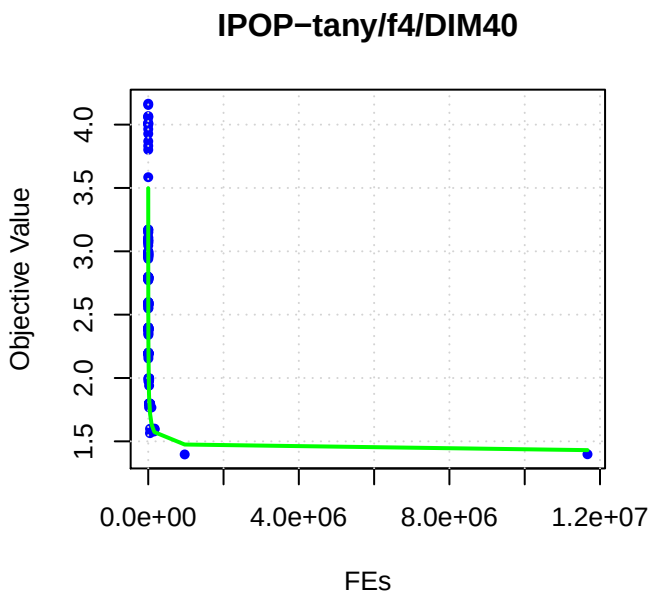
500000
1000000
FEs


IPOP−tany/f4/DIM40
Objective Value
1.5
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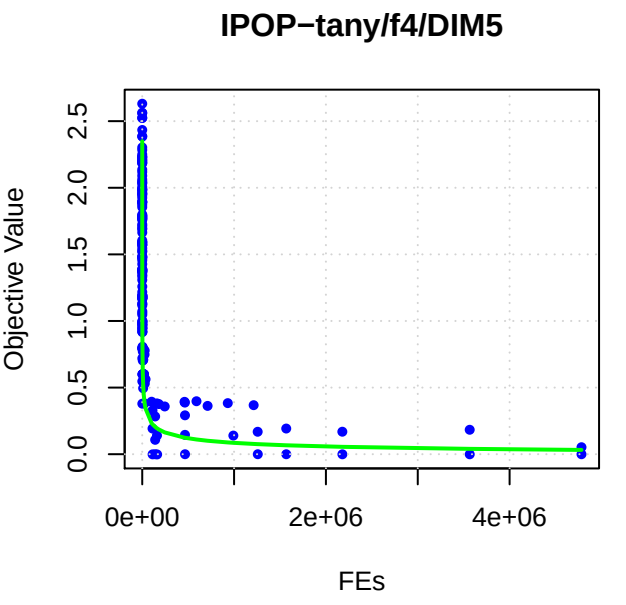
2.5
3.0
3.5
4.0
0.0e+00
4.0e+06
8.0e+06
1.2e+07
FEs


IPOP−tany/f4/DIM5
Objective Value
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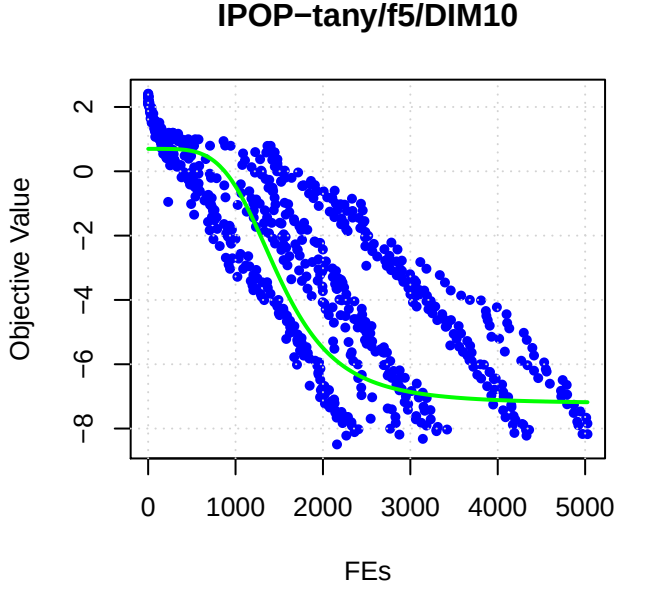
1.5
2.0
2.5
0e+00
2e+06
4e+06
FEs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Objective Value
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−6
−4
−2
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2
0
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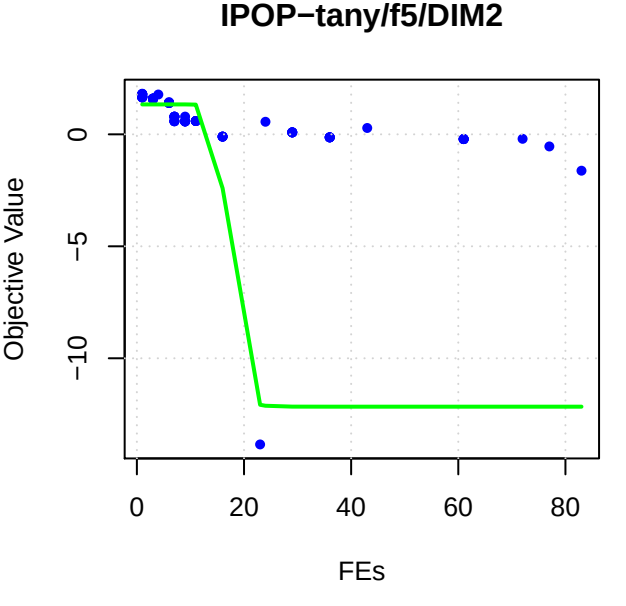
2000
3000
4000
5000
FEs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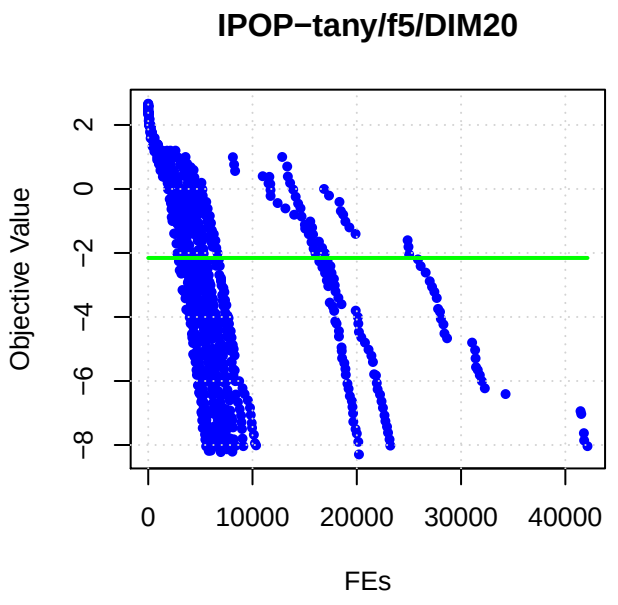
FEs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−8
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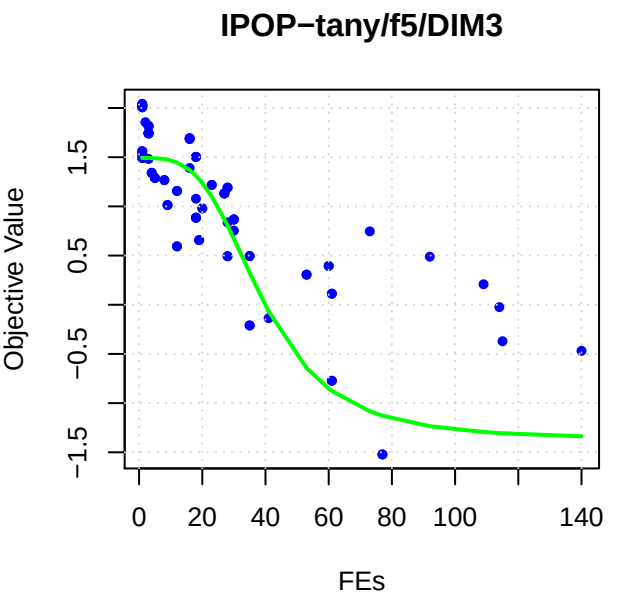
10000
20000
30000
40000
FEs


IPOP−tany/f5/DIM3
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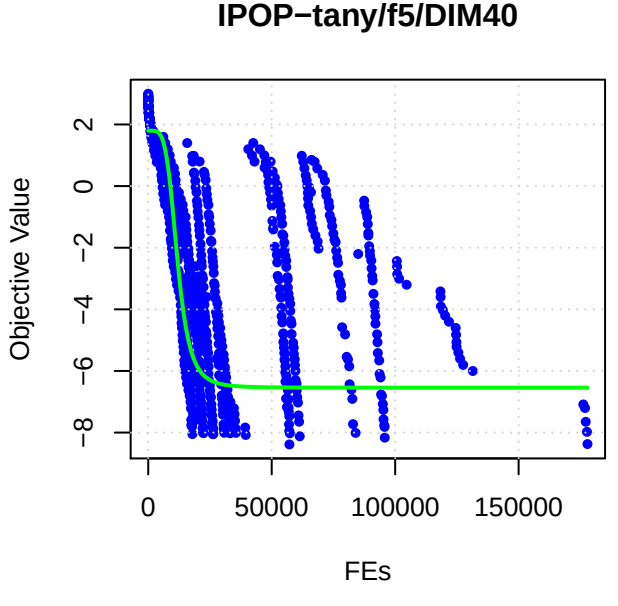
−0.5
−1.5
0
20
40
60
80
100
140
FEs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Objective Value
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−2
−4
−6
−8
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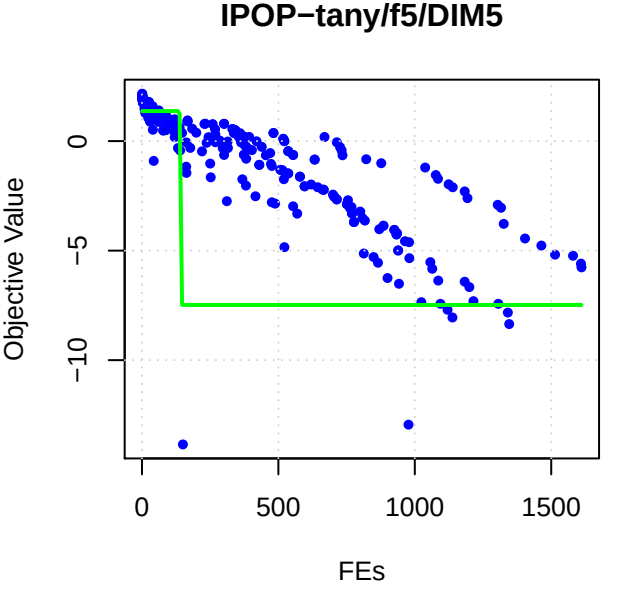
100000
150000
FEs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−10
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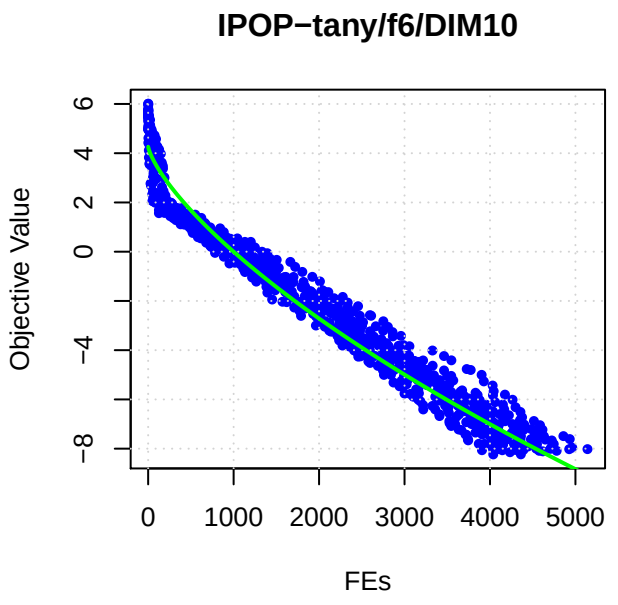
1000
1500
FEs


IPOP−tany/f6/DIM10
Objective Value
FEs
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2
0
−4
−8
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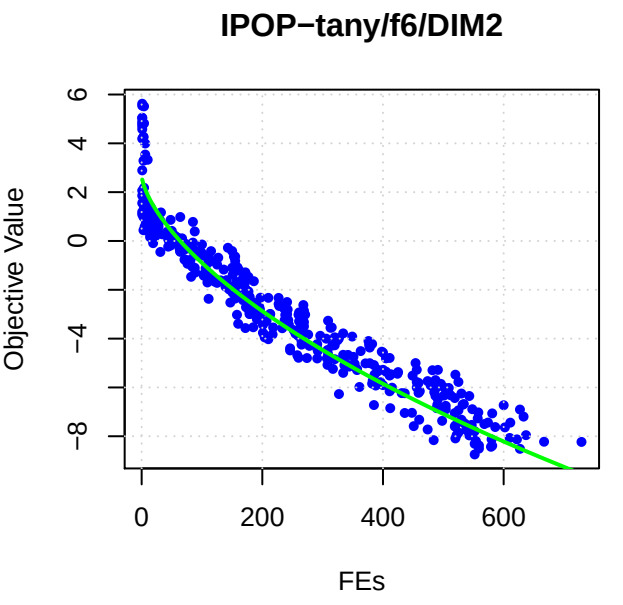
1000
2000
3000
4000
5000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Objective Value
FEs
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2
0
−4
−8
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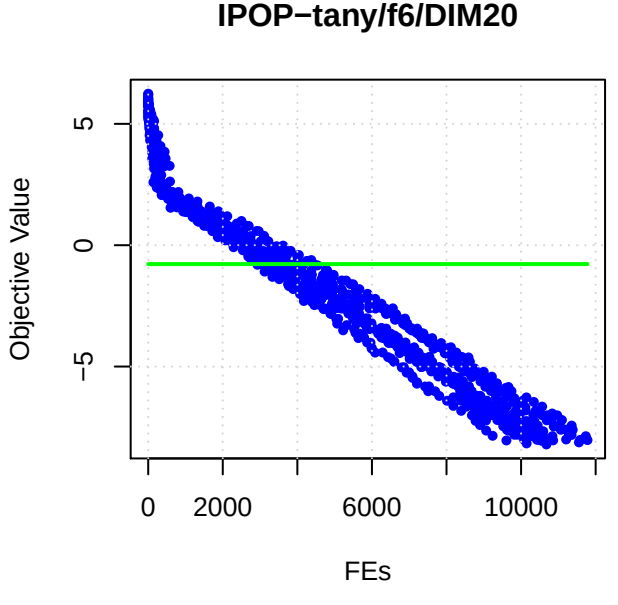
200
400
600


IPOP−tany/f6/DIM20
Objective Value
FEs
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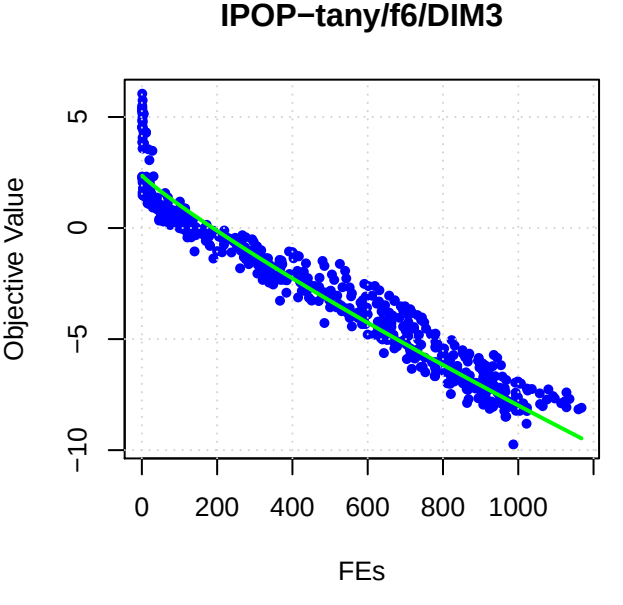
6000
10000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Objective Value
FEs
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600
800
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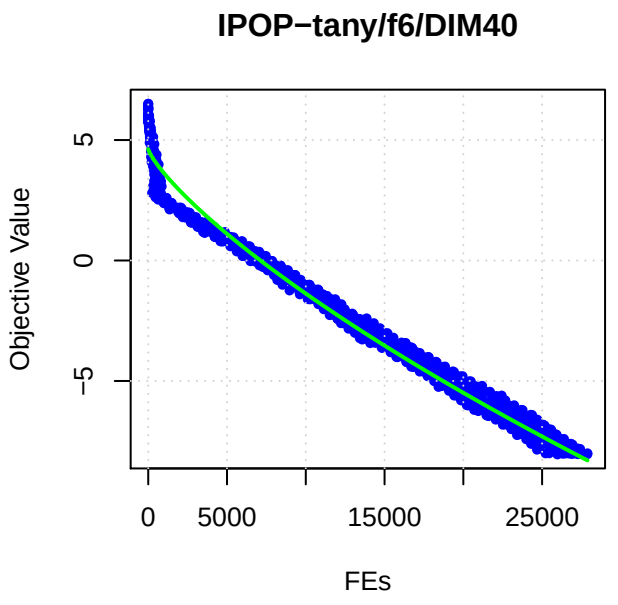
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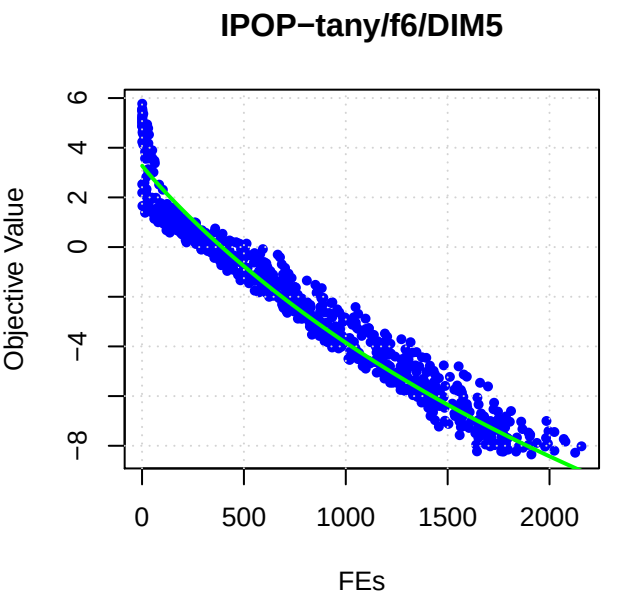
0
5000
15000
25000
FEs


IPOP−tany/f6/DIM5
Objective Value
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4
2
0
−4
−8
0
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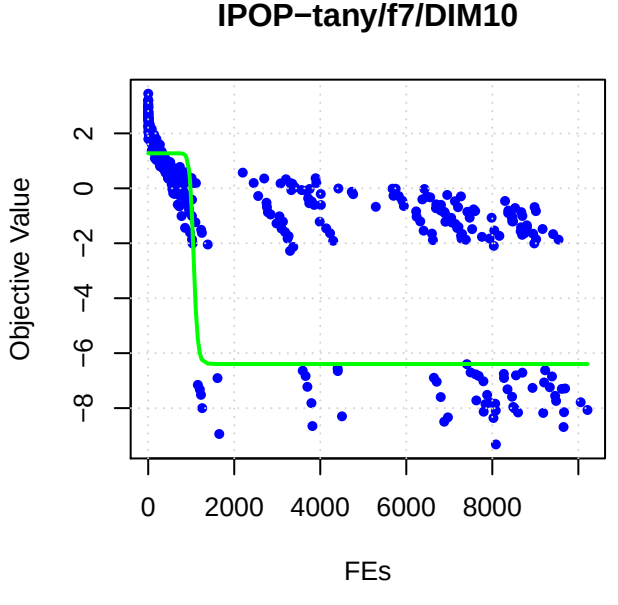
1000
1500
2000
FEs


IPOP−tany/f7/DIM10
Objective Value
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−4
−6
−8
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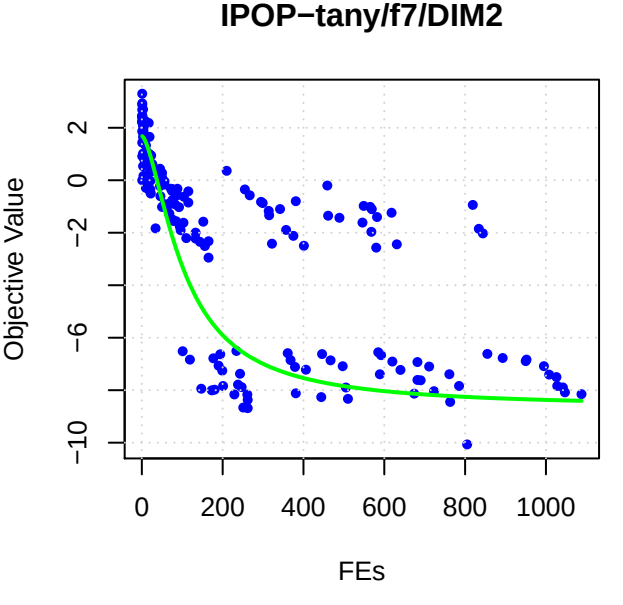
4000
6000
8000
FEs


IPOP−tany/f7/DIM2
Objective Value
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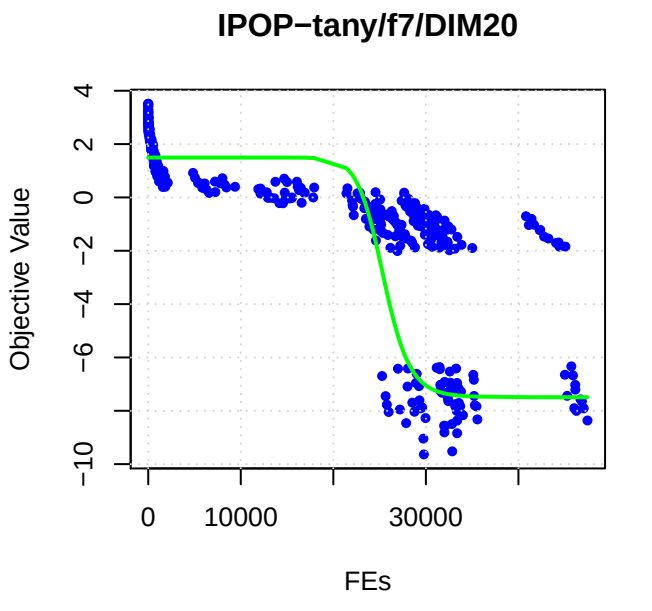
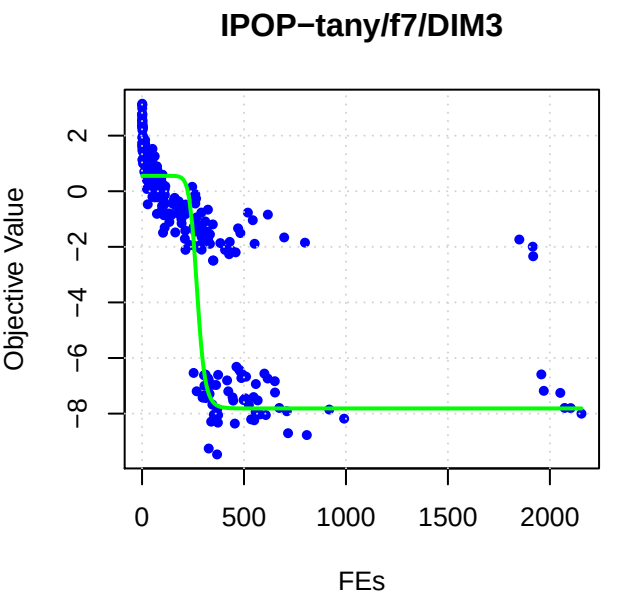
−2
−6
−10
0
200
400
600
800
1000
FEs


IPOP−tany/f7/DIM20
Objective Value
FEs
4
2
0
−2
−4
−6
−10
0
10000
30000


IPOP−tany/f7/DIM3
Objective Value
FEs
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−2
−4
−6
−8
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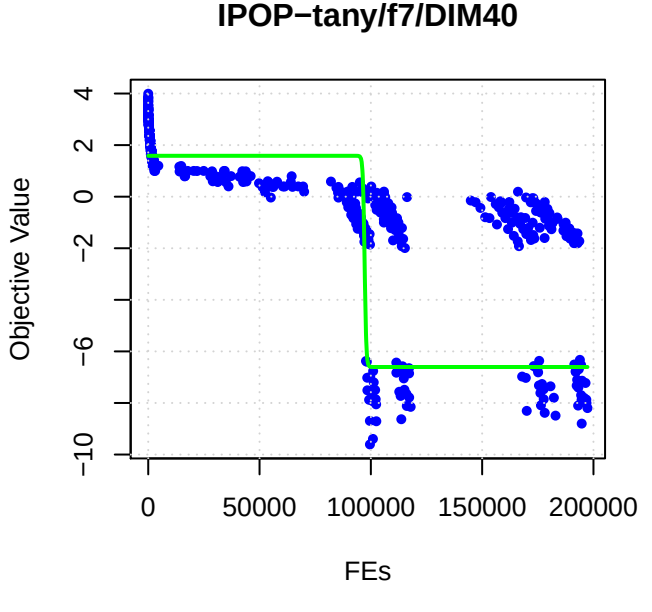
1000
1500
2000


IPOP−tany/f7/DIM40
Objective Value
FEs
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2
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−2
−6
−10
0
50000
100000
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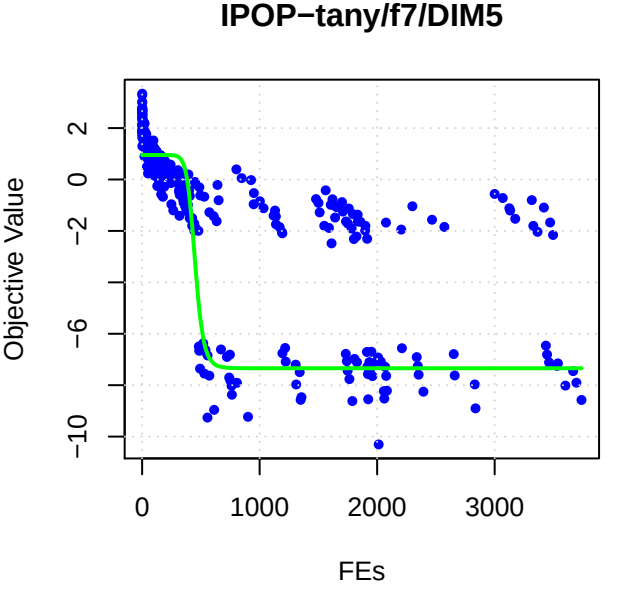
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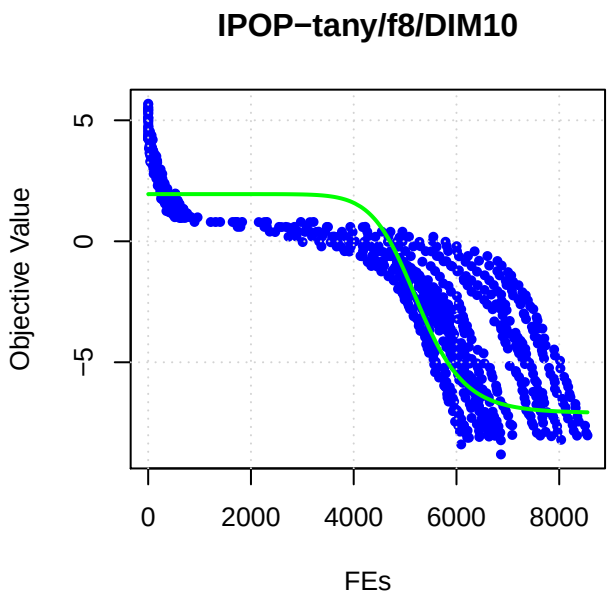
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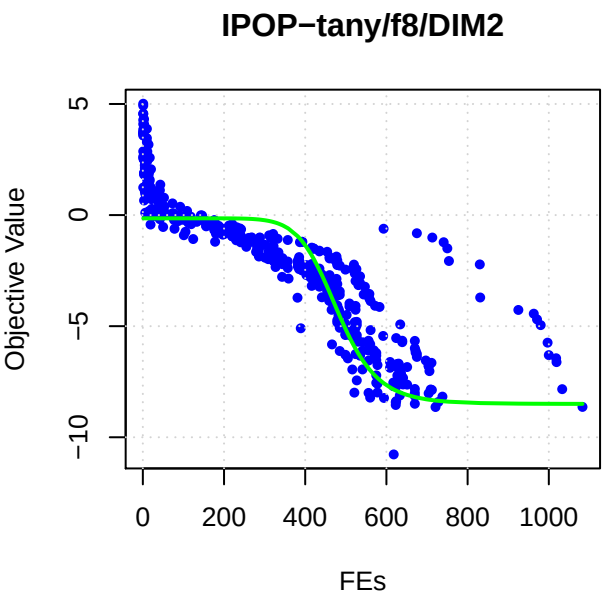
FEs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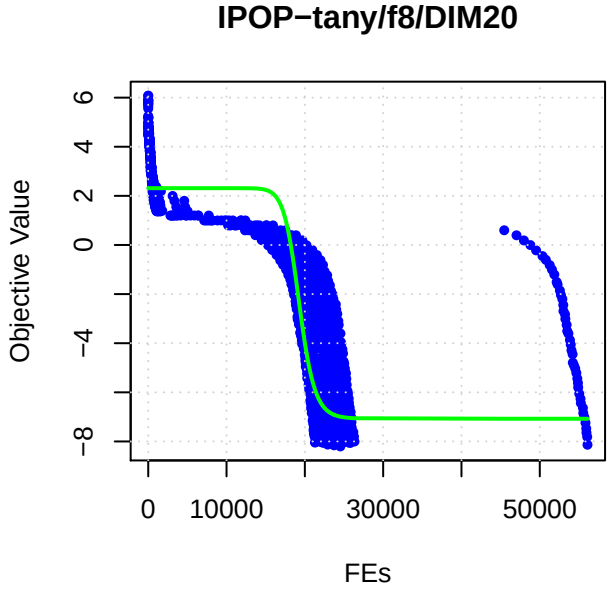
800
1000
FEs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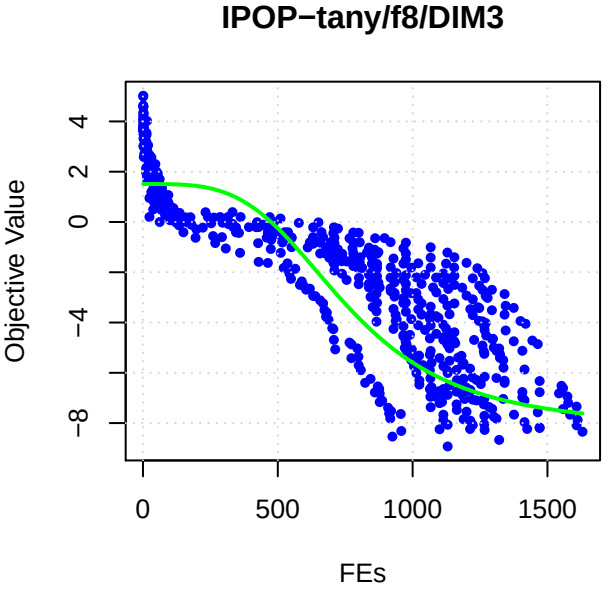
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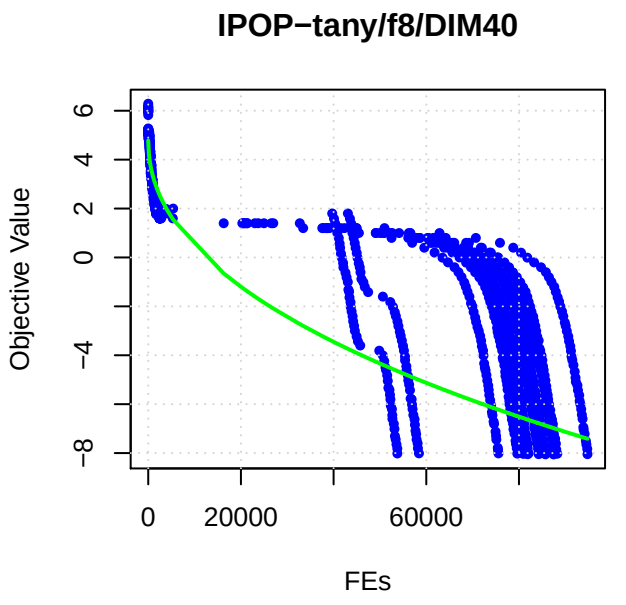
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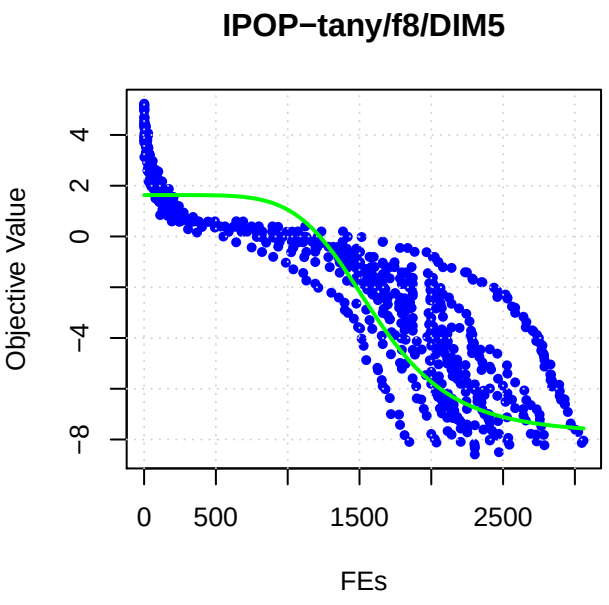
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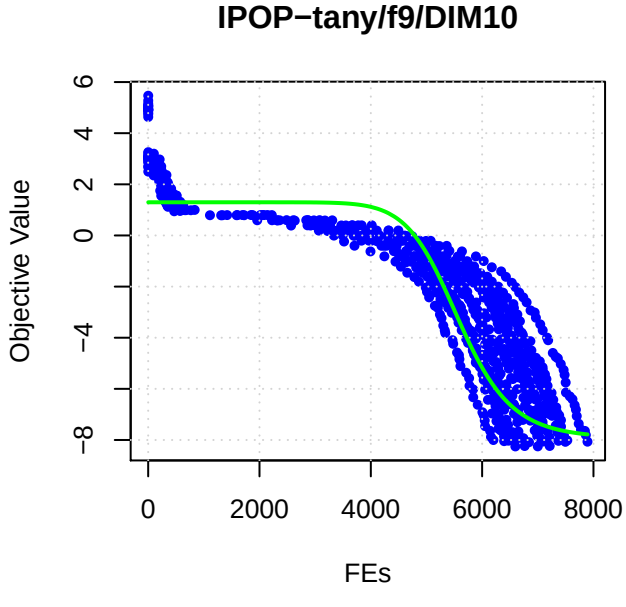
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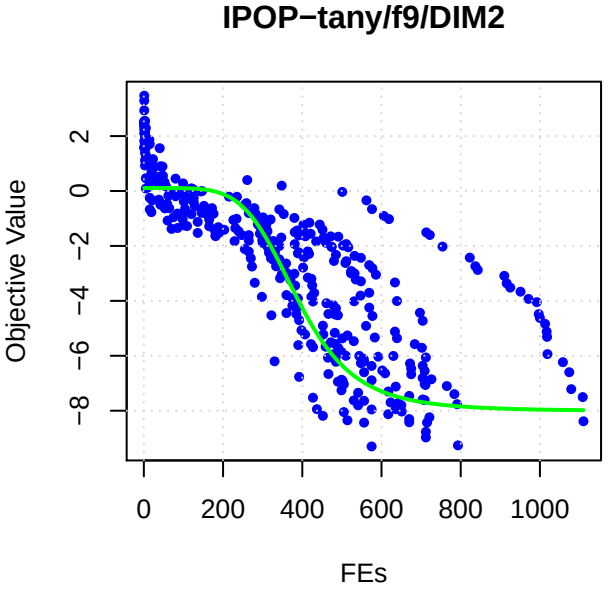
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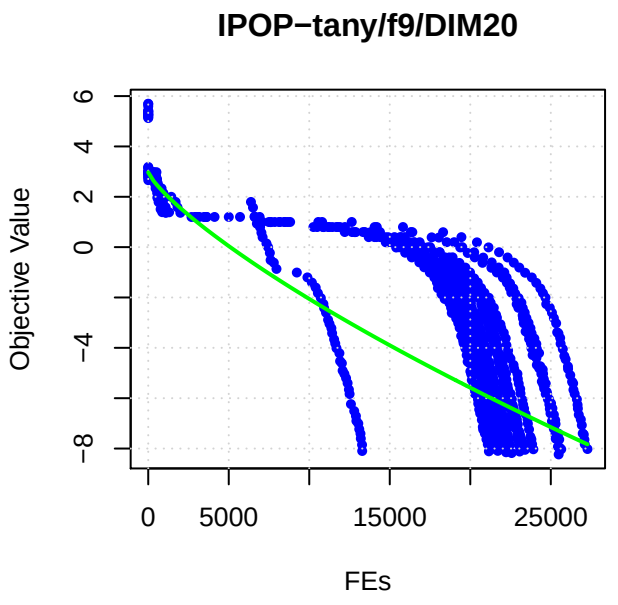
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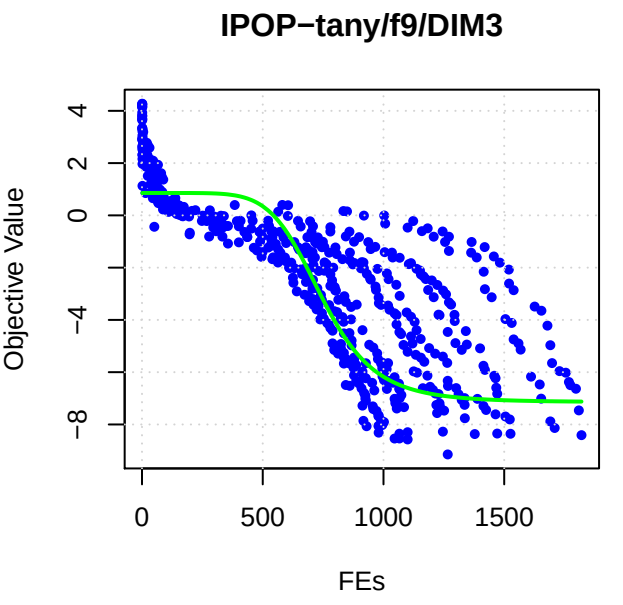
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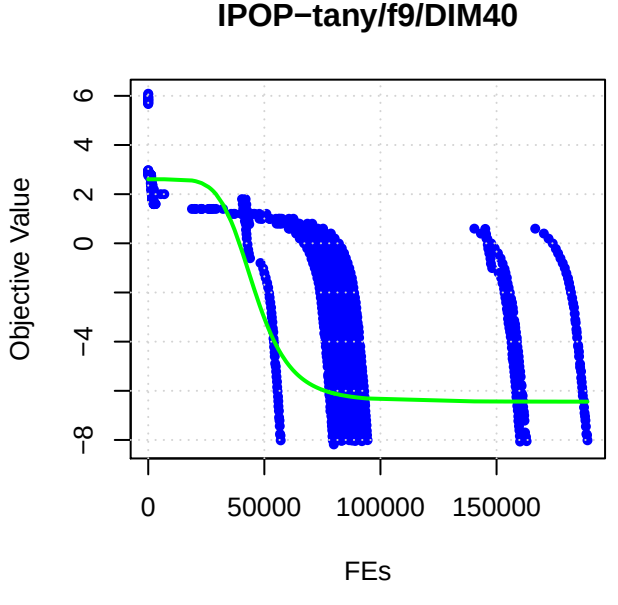
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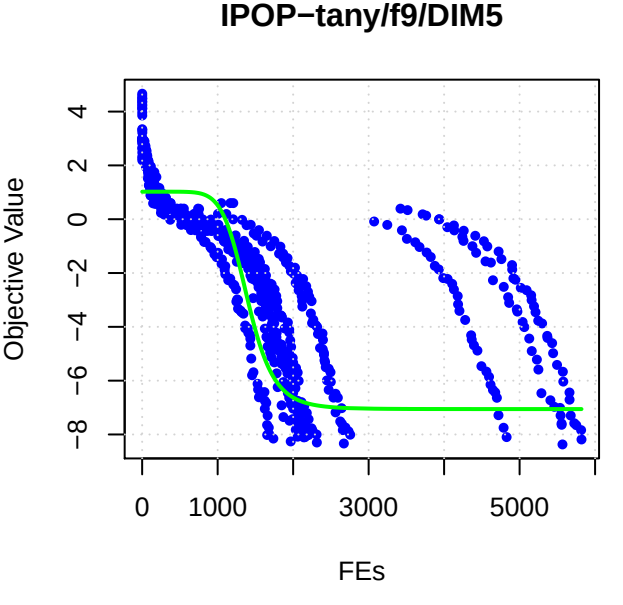
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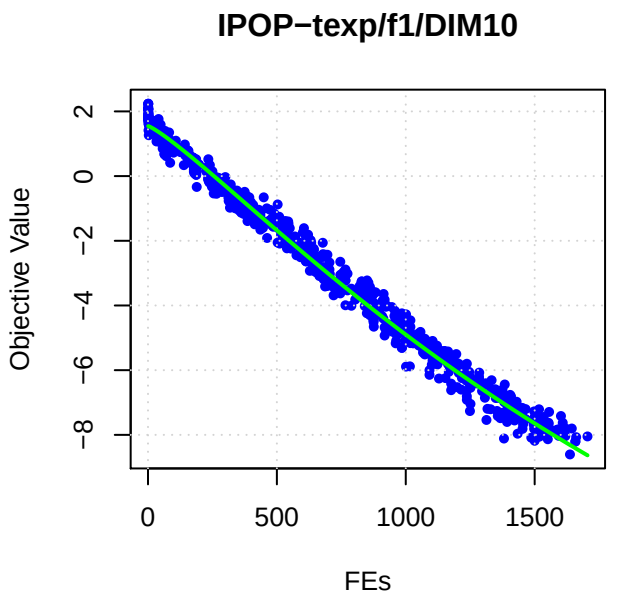
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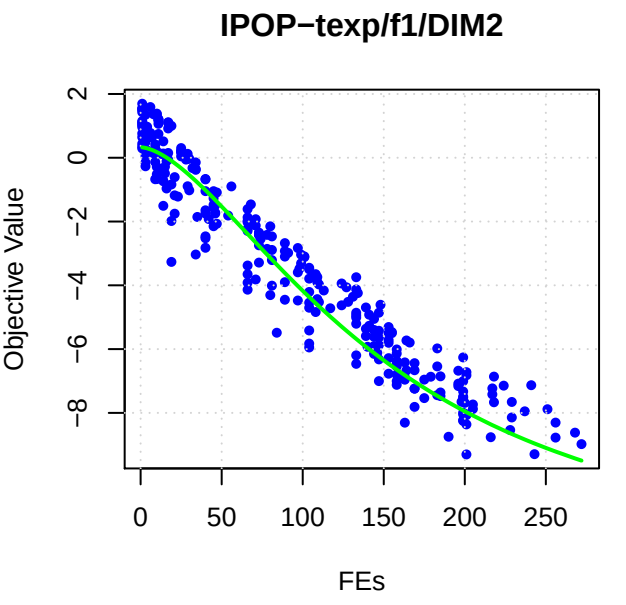
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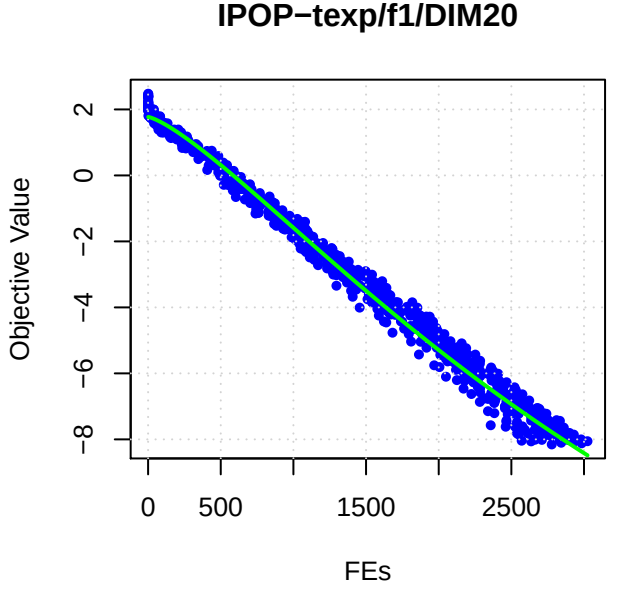
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Objective Value
FEs
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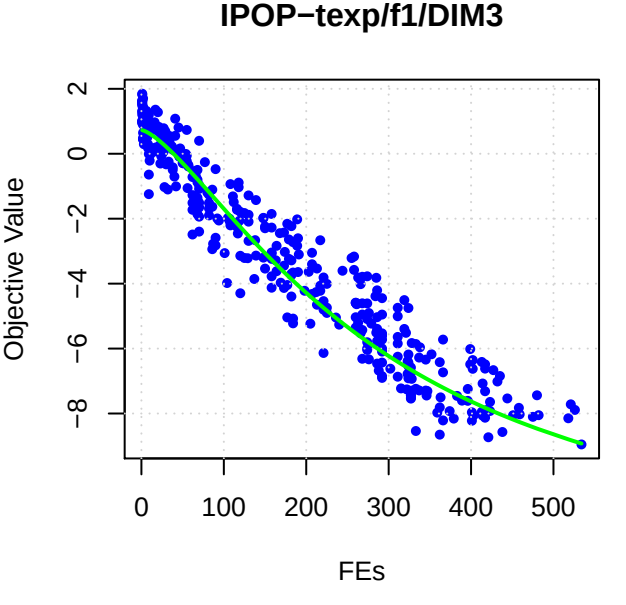
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FEs
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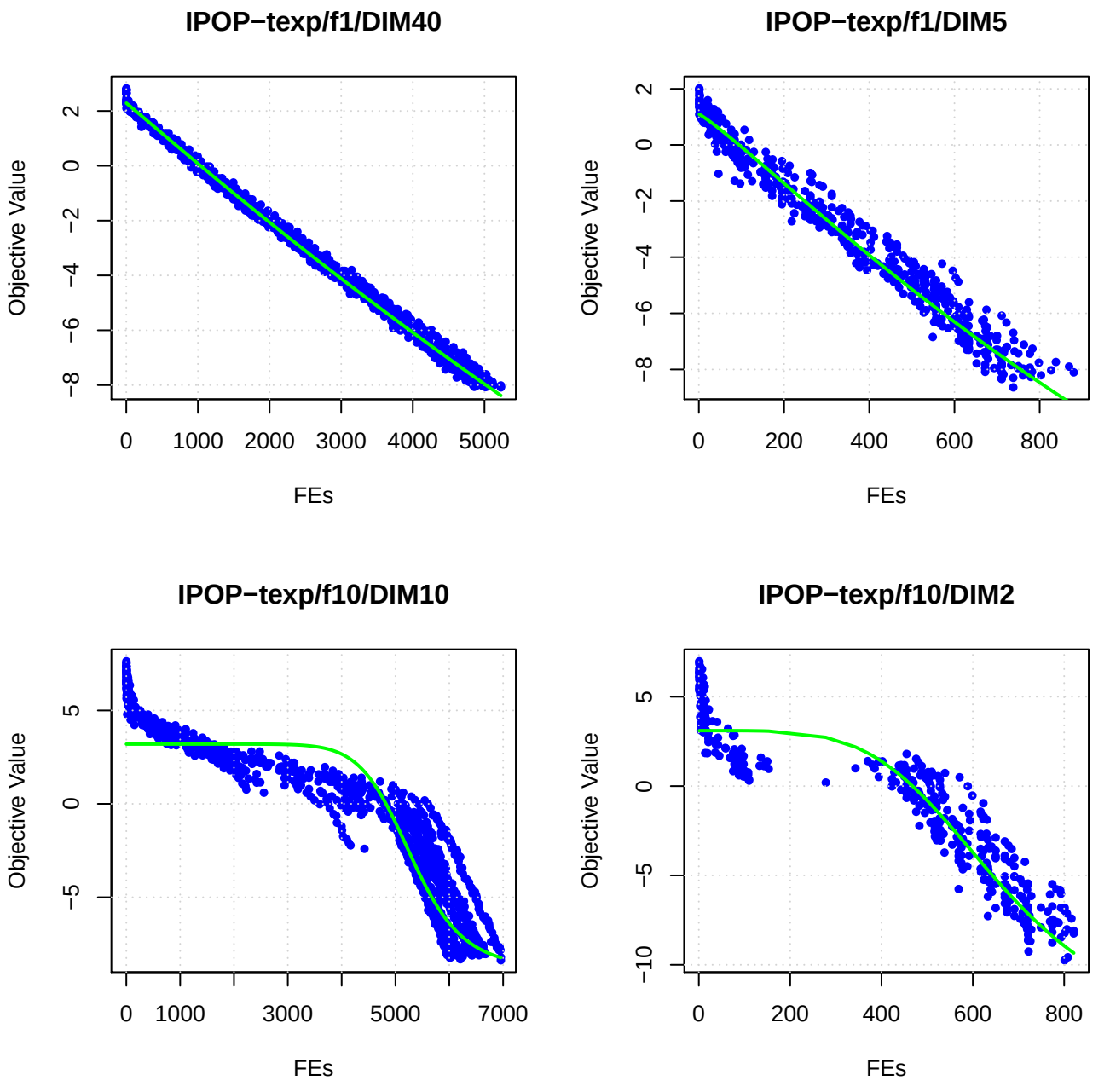
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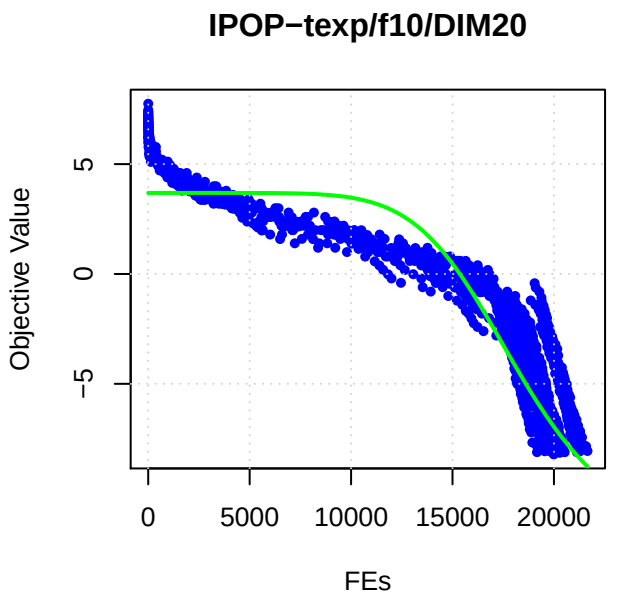
IPOP−texp/f1/DIM5
Objective Value
FEs
IPOP−texp/f10/DIM10
Objective Value
FEs
IPOP−texp/f10/DIM2
Objective Value
FEs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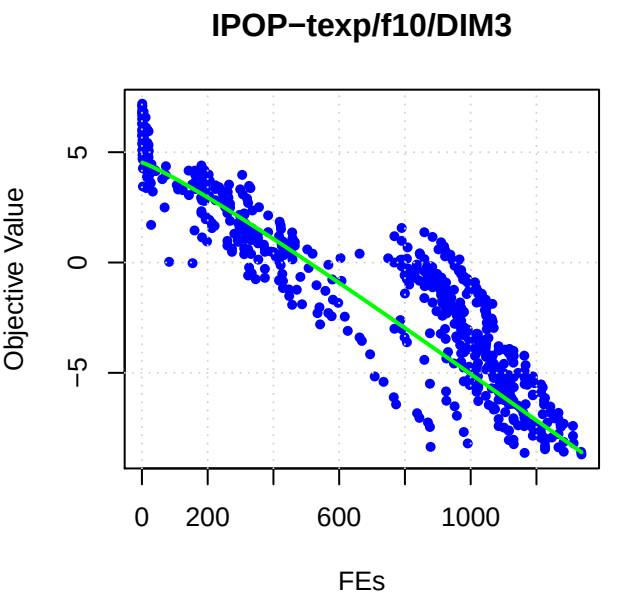
FEs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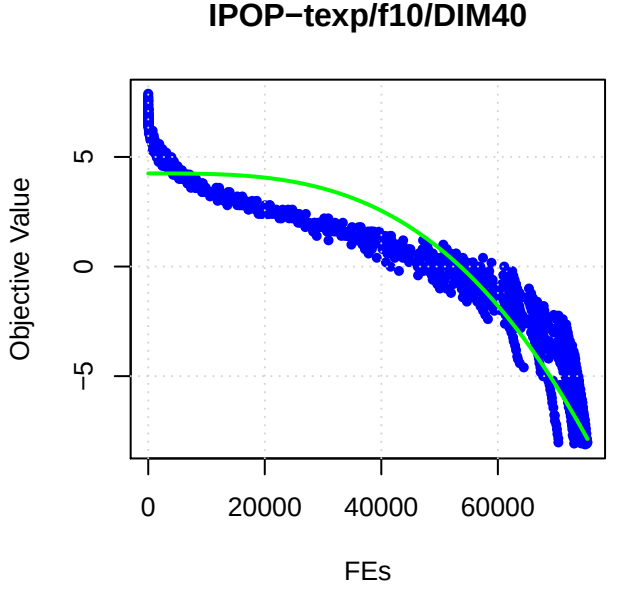
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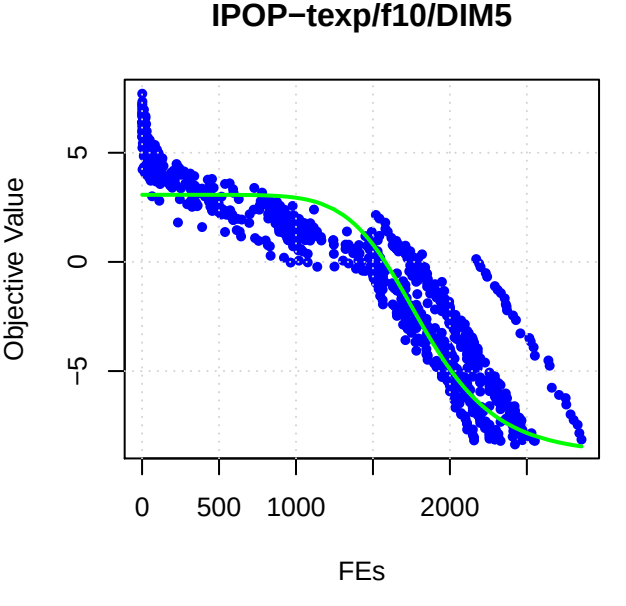
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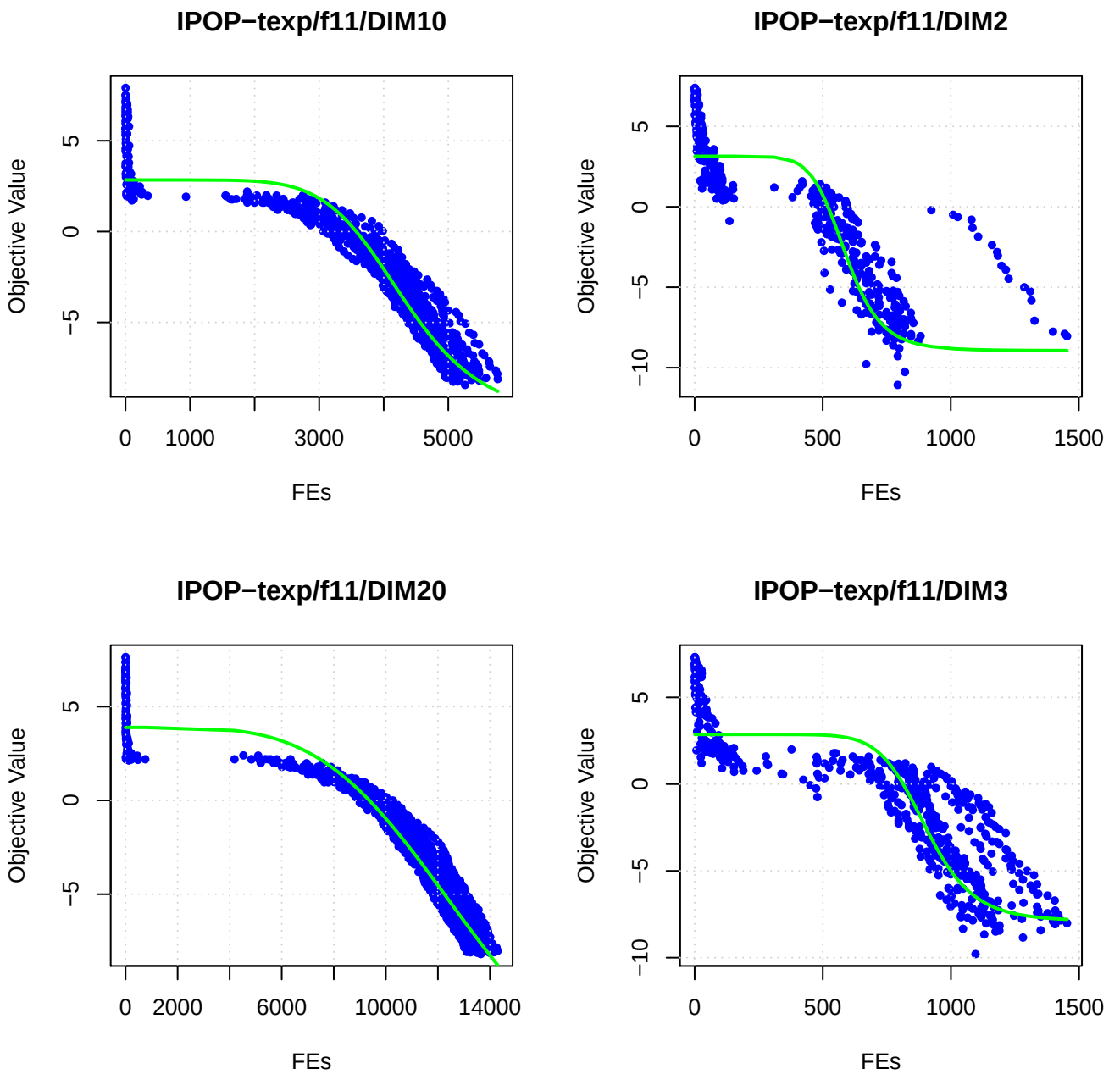
FEs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FEs
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1000
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Objective Value
FEs
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Objective Value
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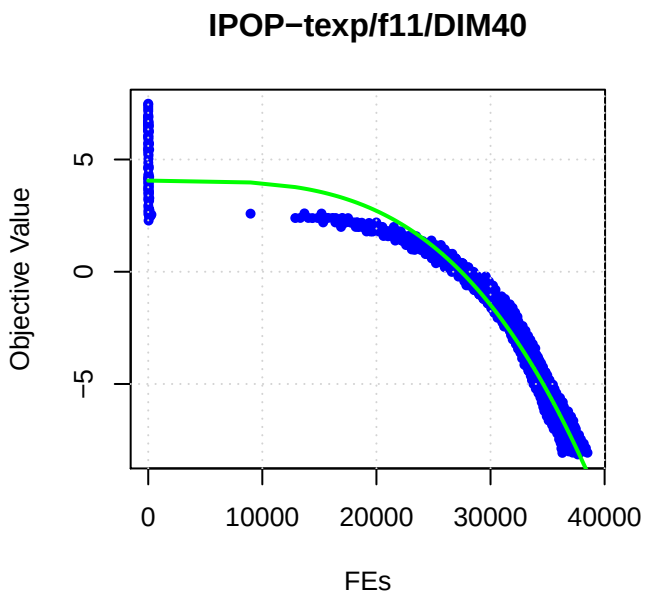
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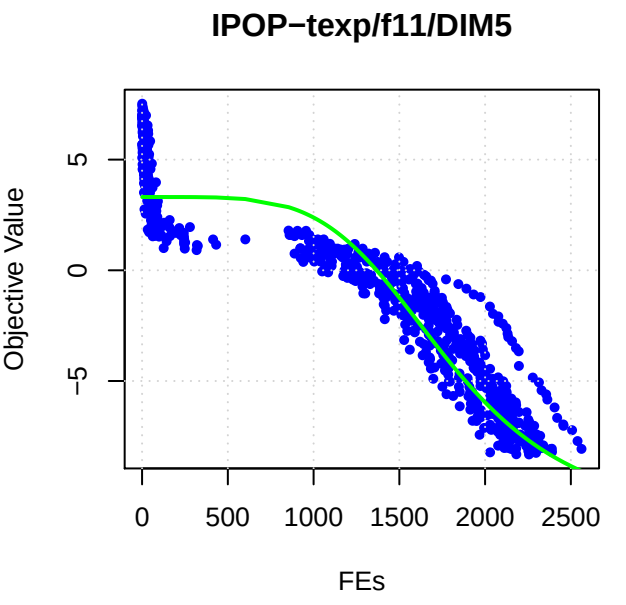
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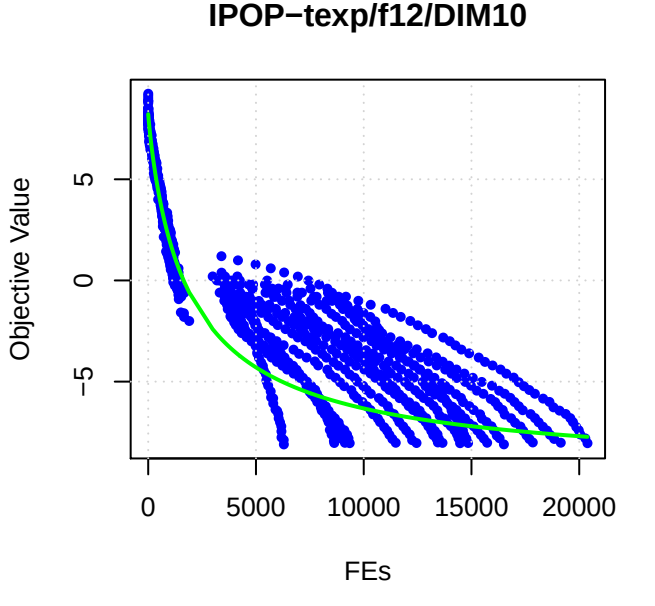
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15000
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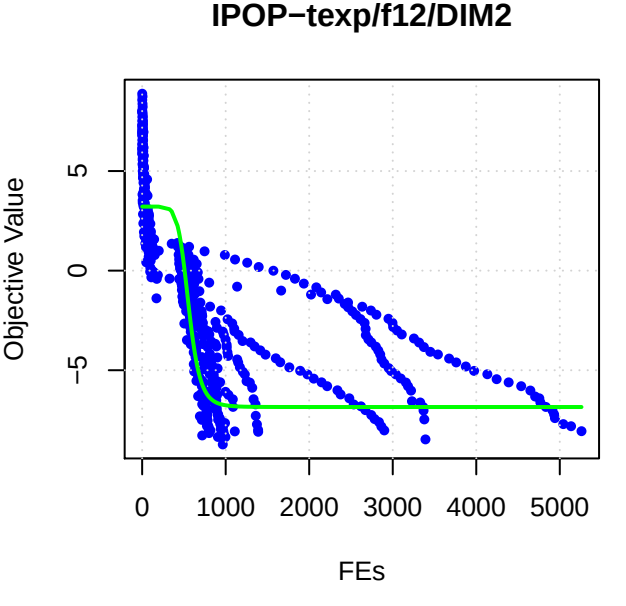
FEs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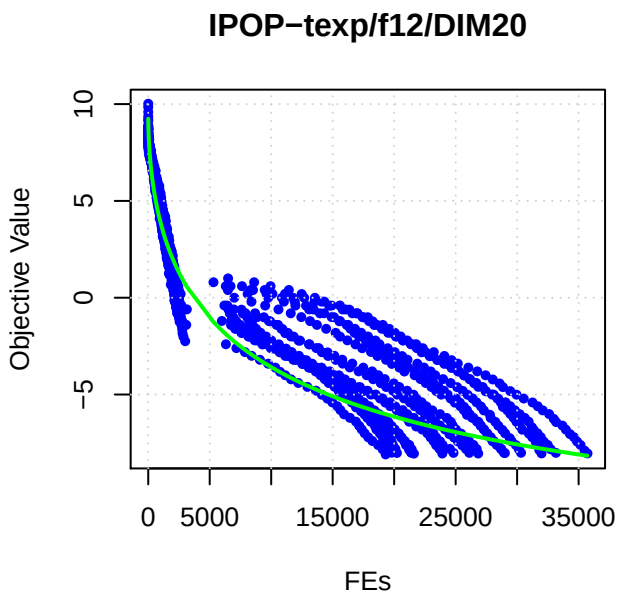
FEs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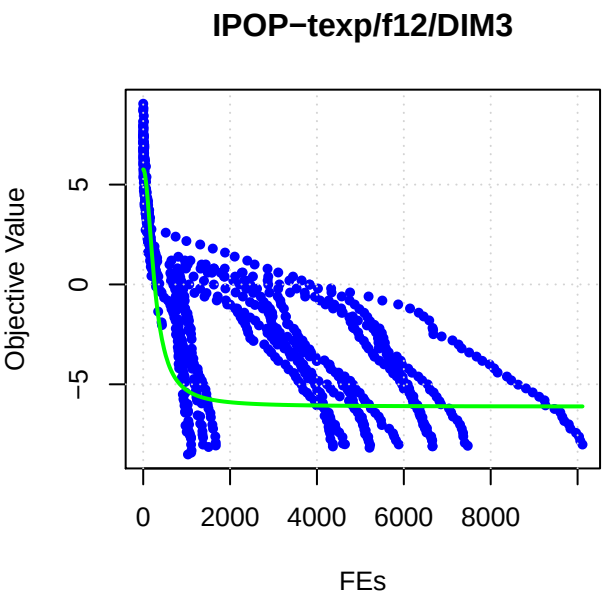
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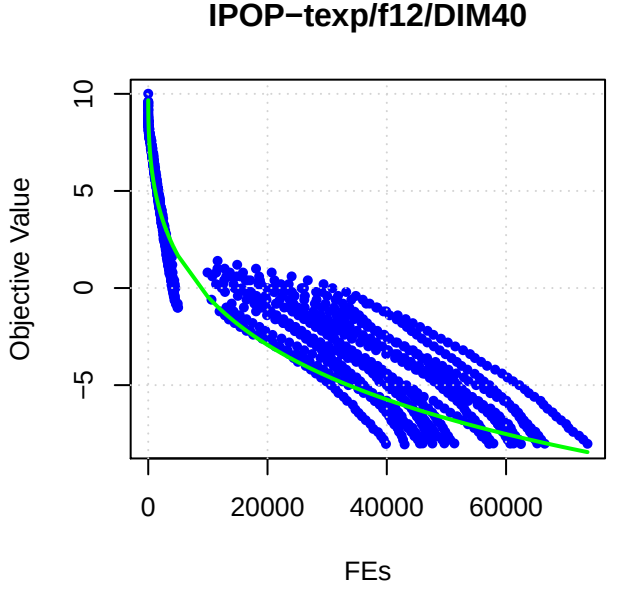
FEs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40000
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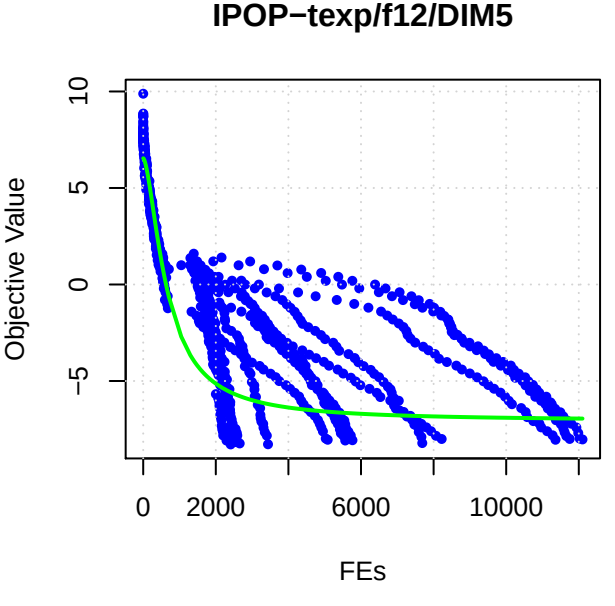
FEs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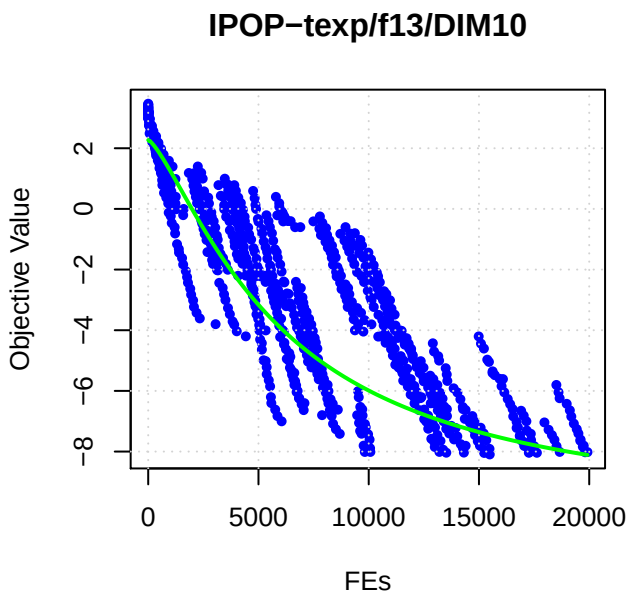
FEs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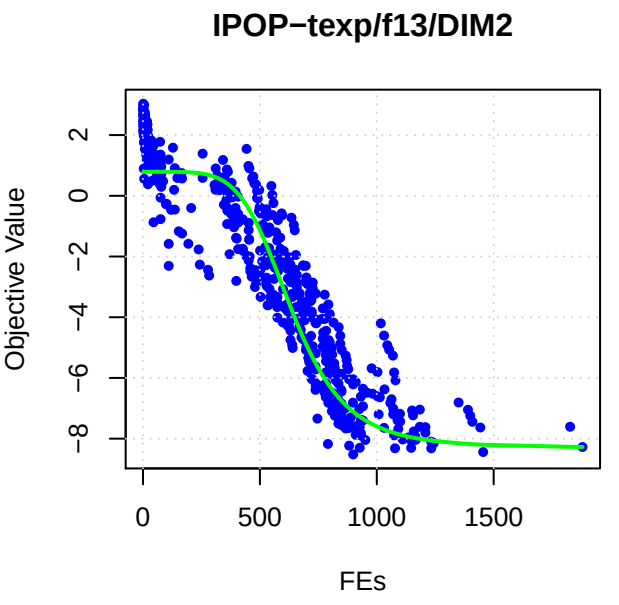
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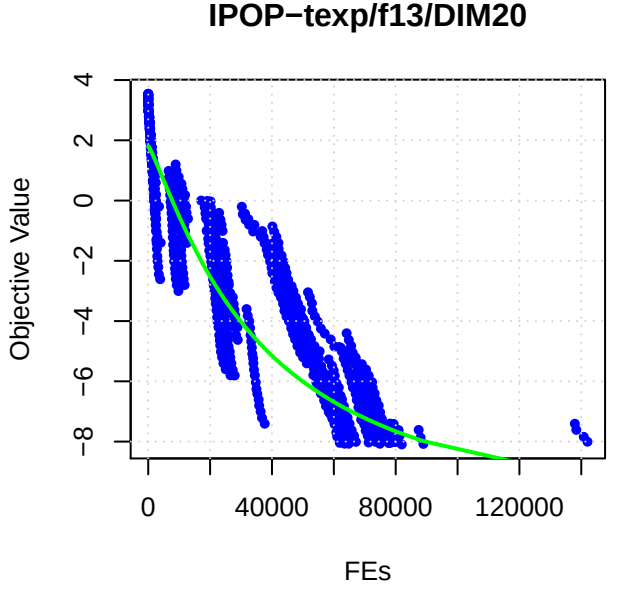
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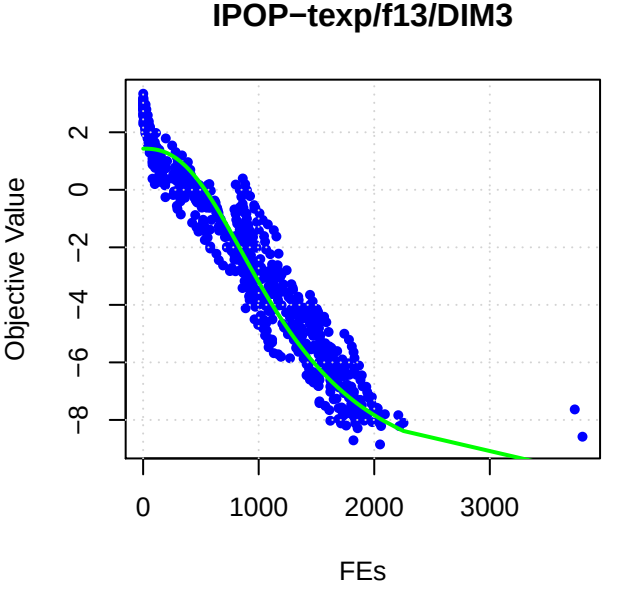
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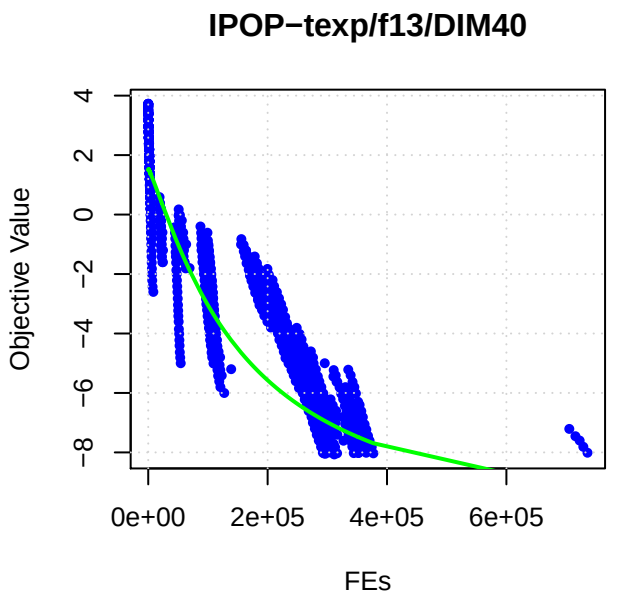
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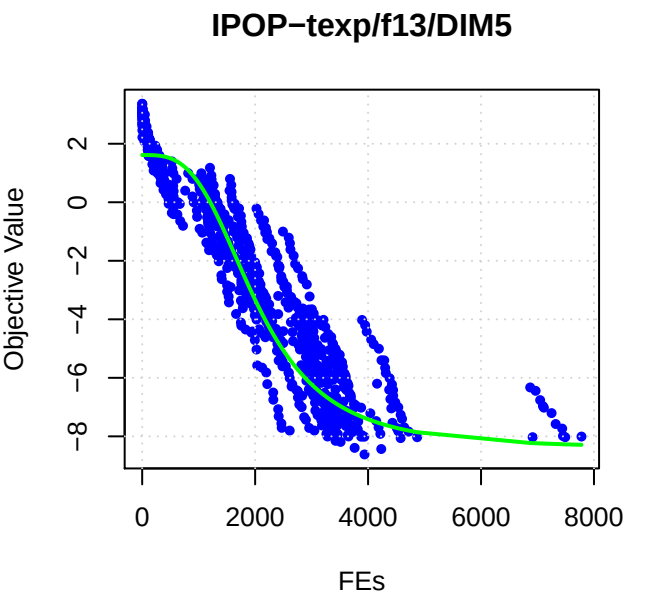
IPOP−texp/f13/DIM5
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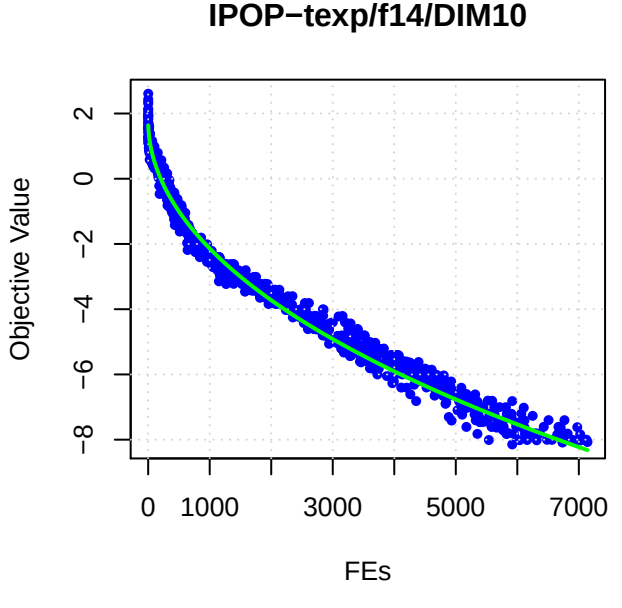
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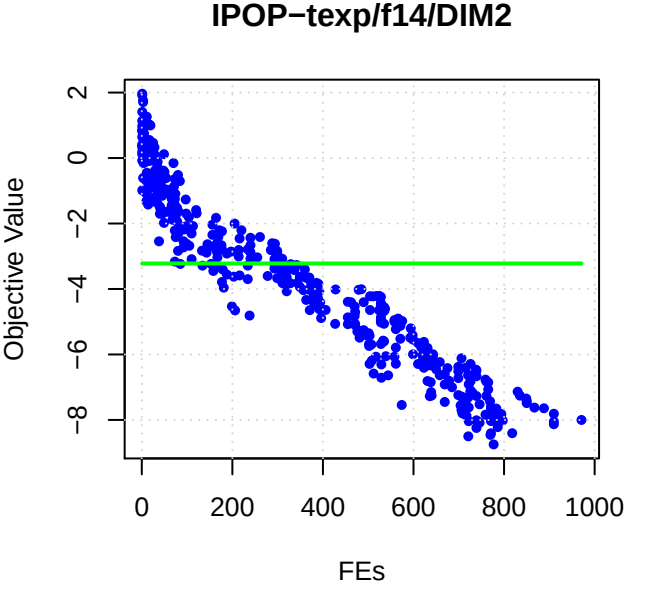
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800
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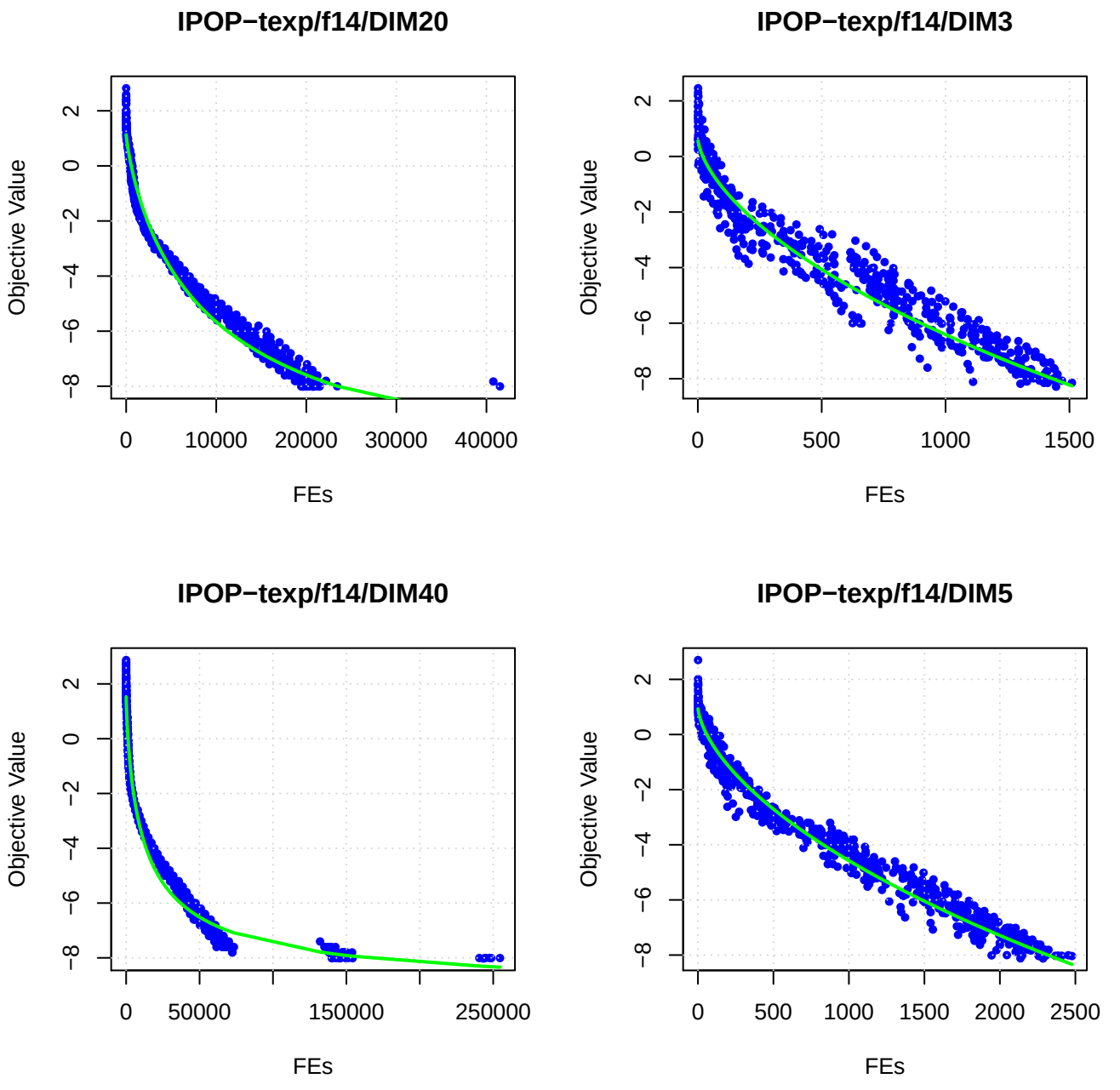
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Objective Value
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Objective Value
FEs
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IPOP−texp/f14/DIM5
Objective Value
FEs
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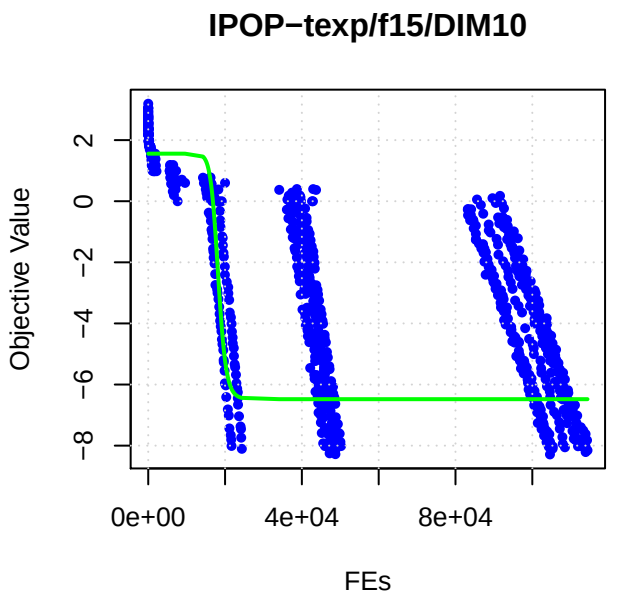
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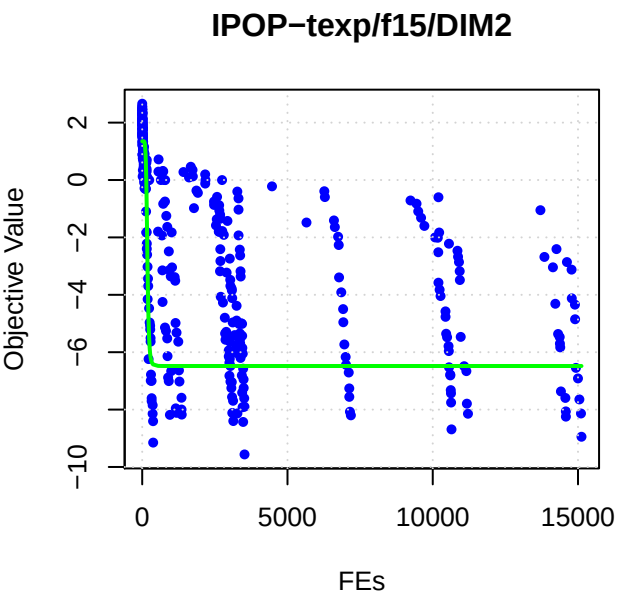
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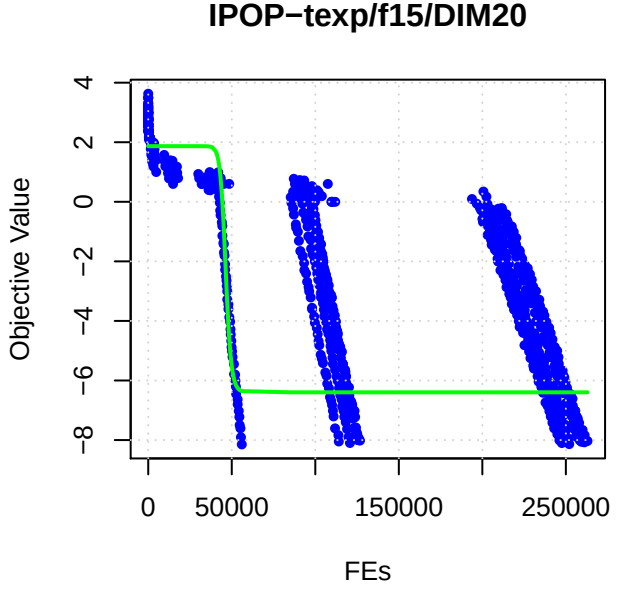
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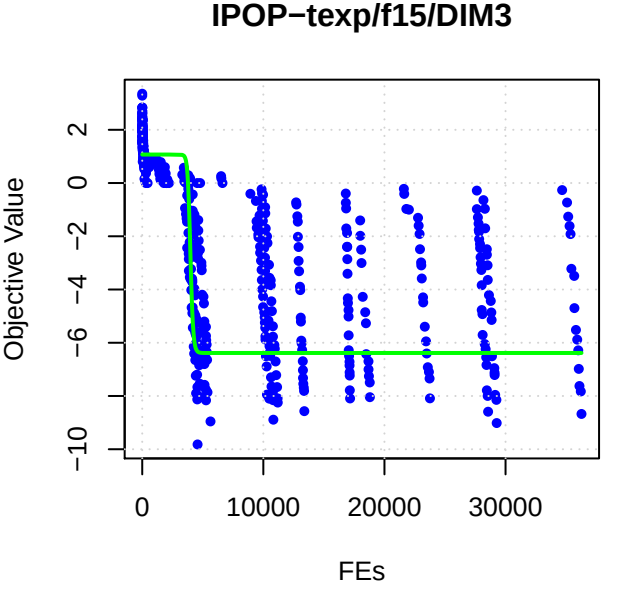
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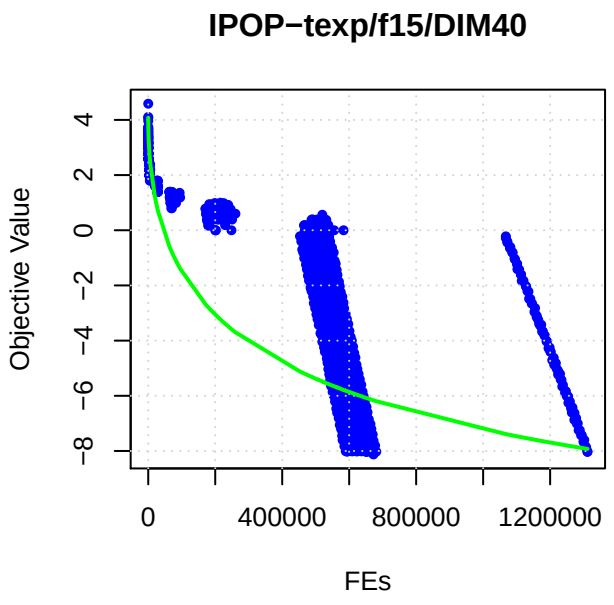
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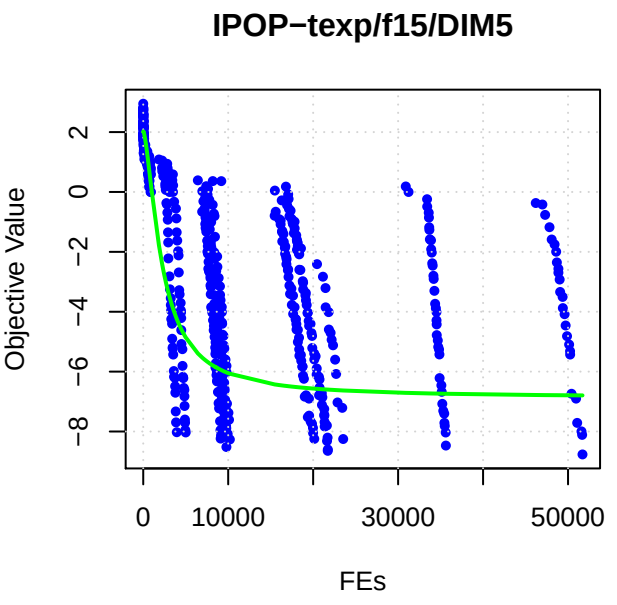
1200000
FEs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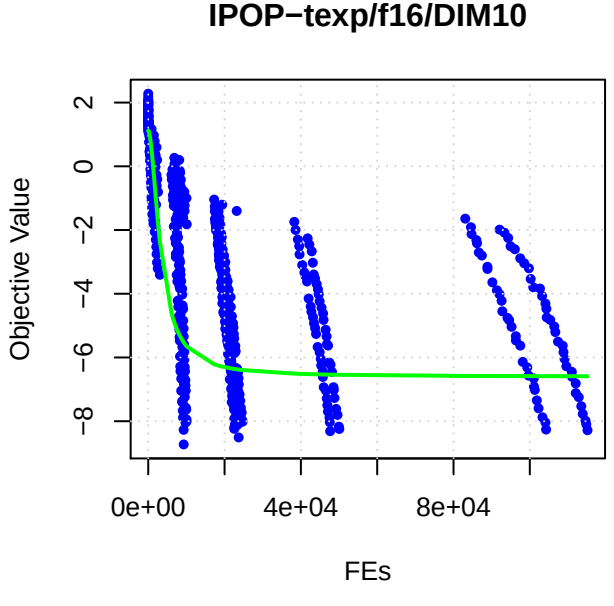
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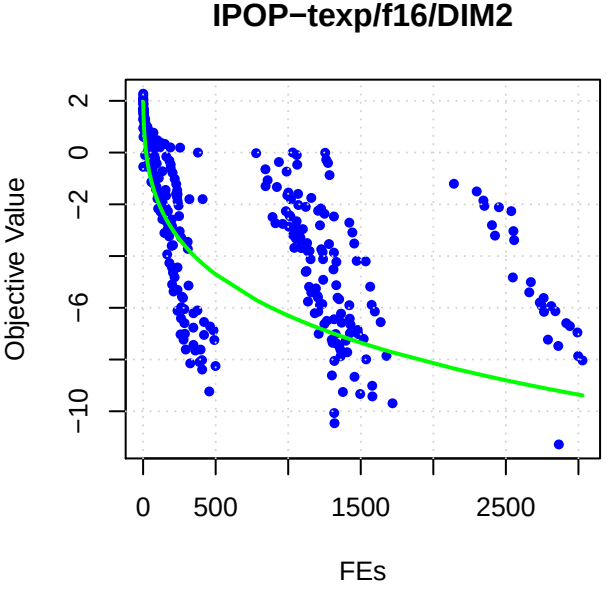
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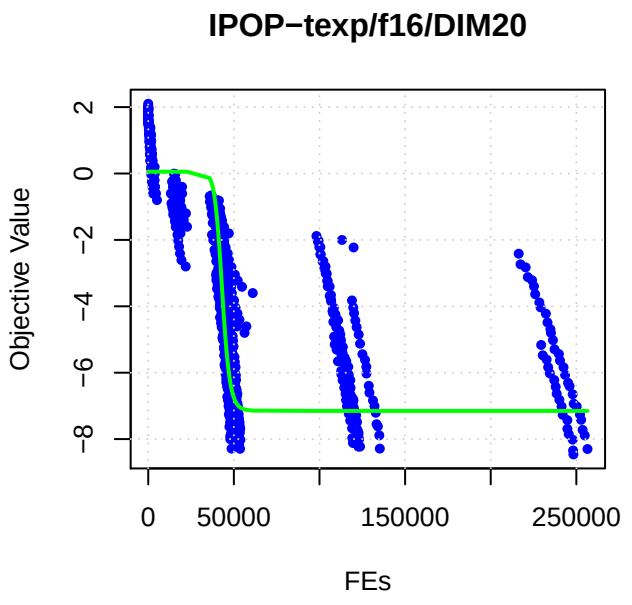
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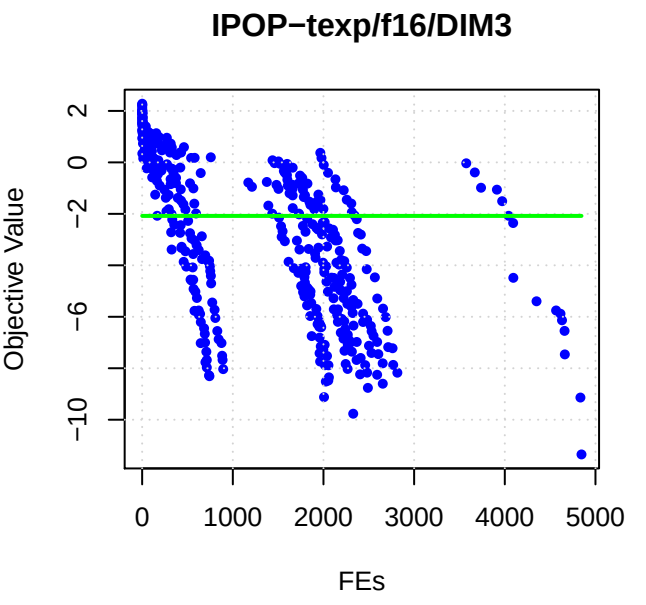
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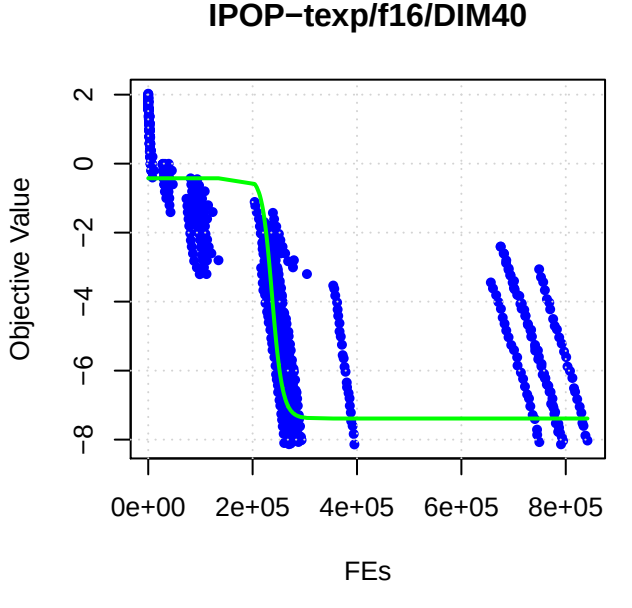
FEs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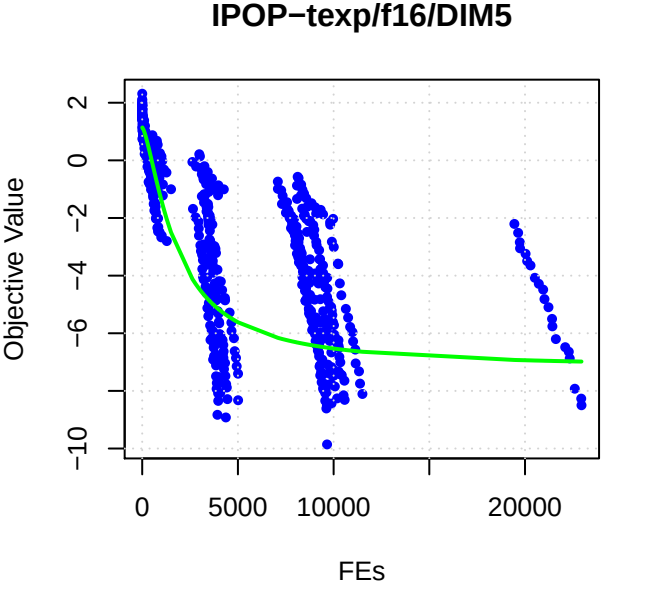
FEs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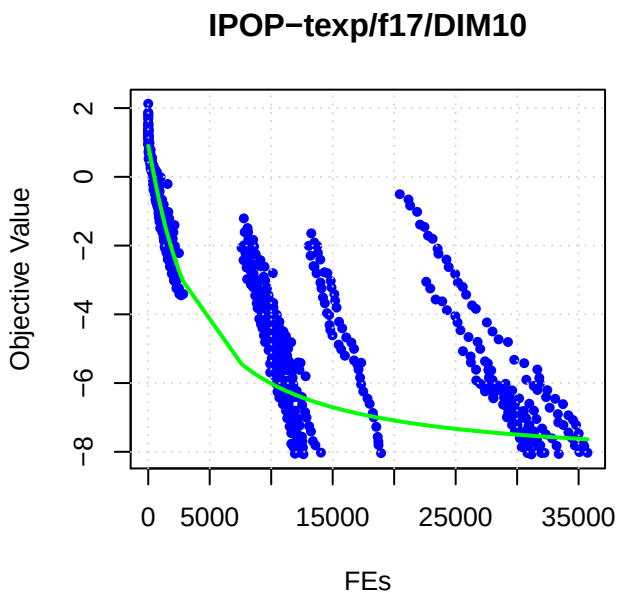
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Objective Value
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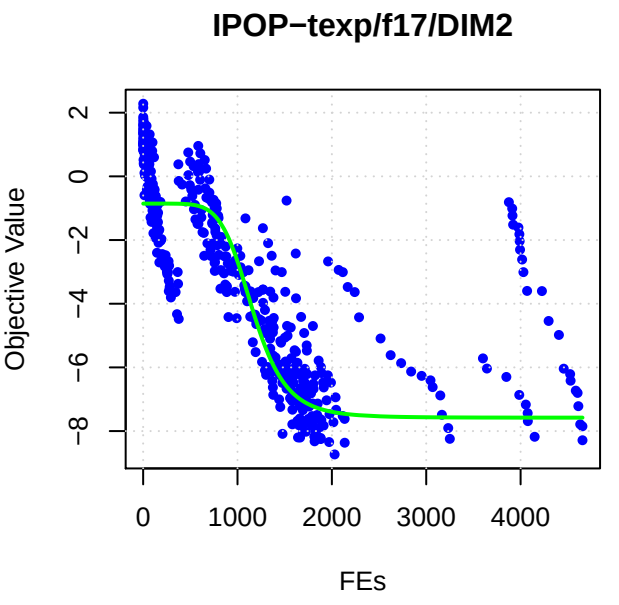
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Objective Value
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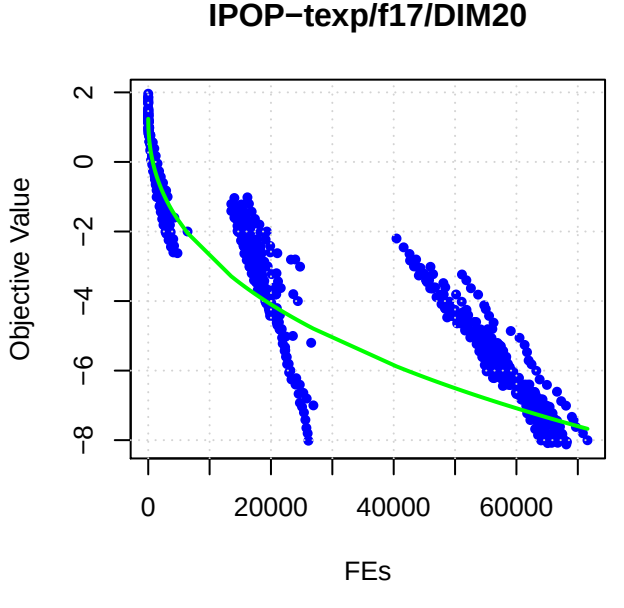
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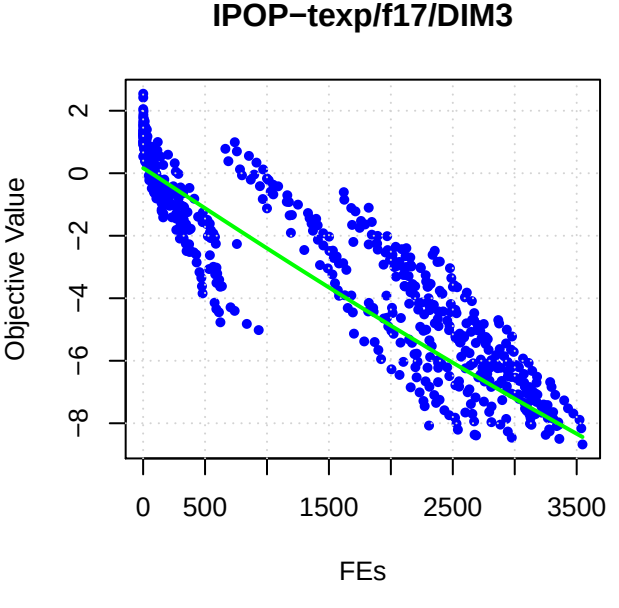
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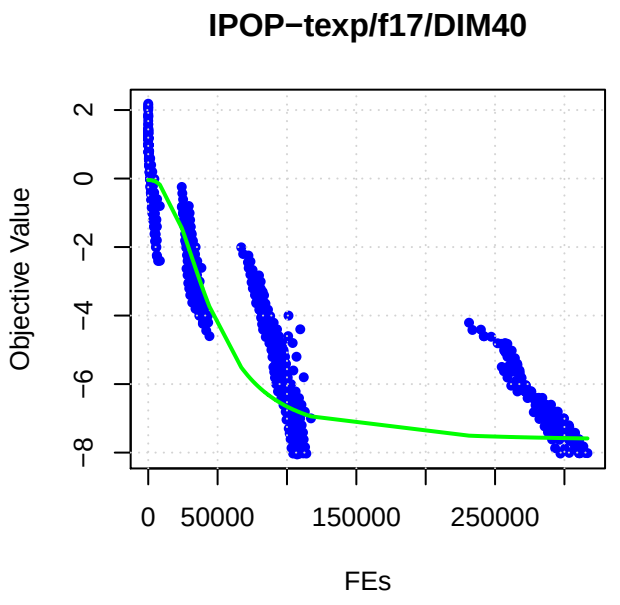
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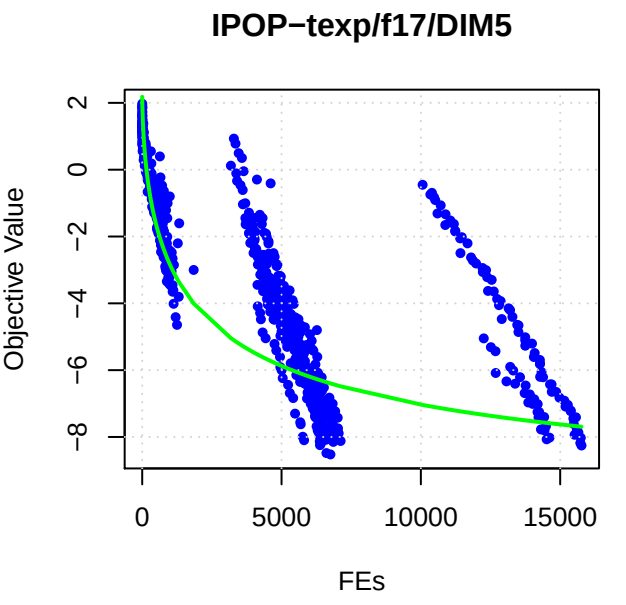
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Objective Value
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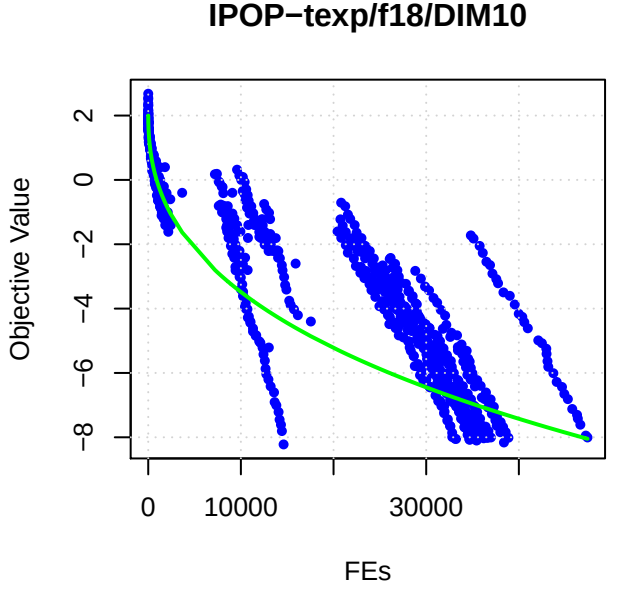
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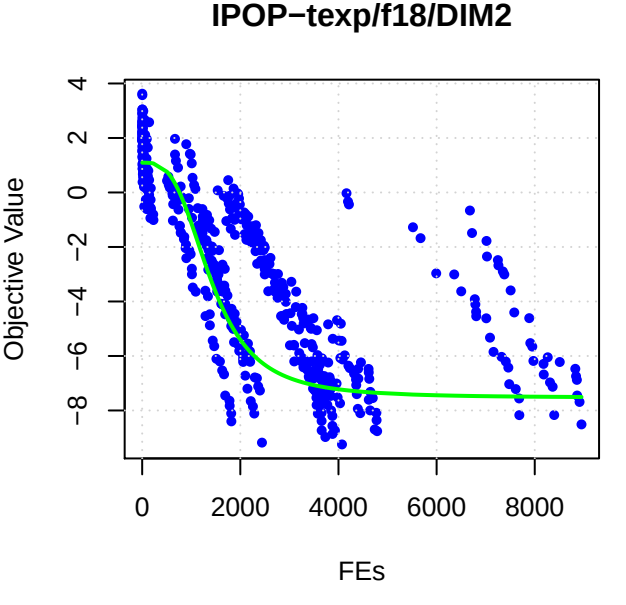
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Objective Value
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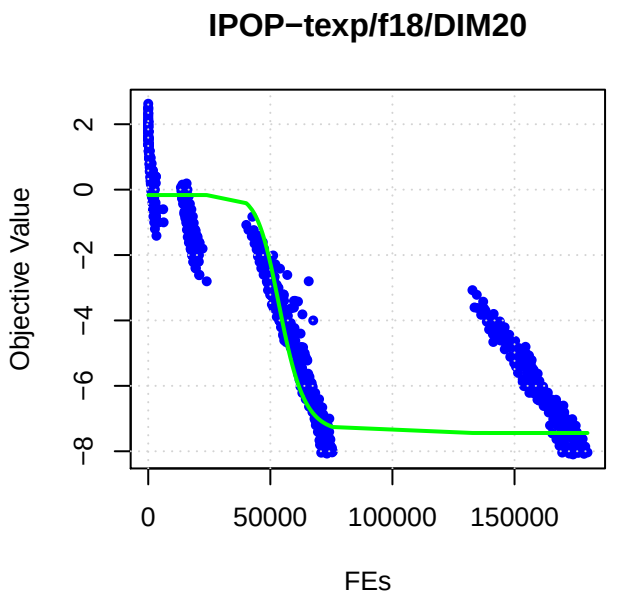
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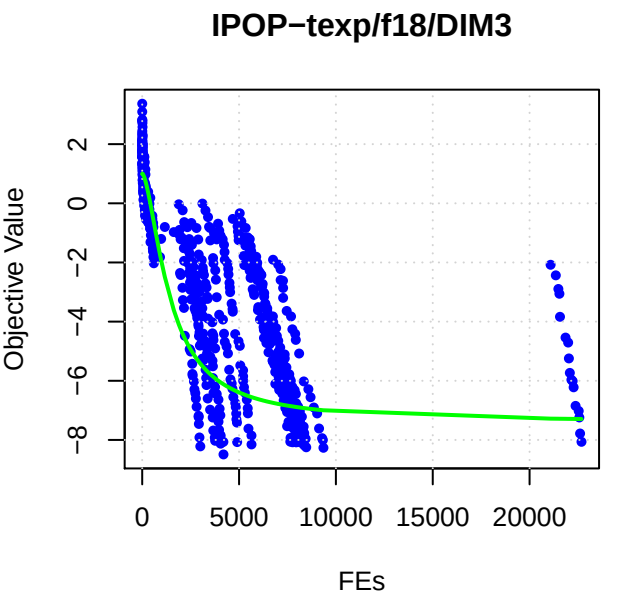
FEs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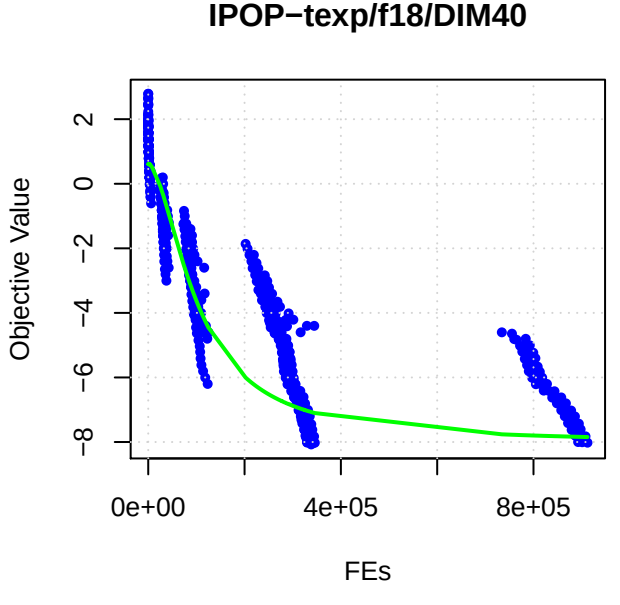
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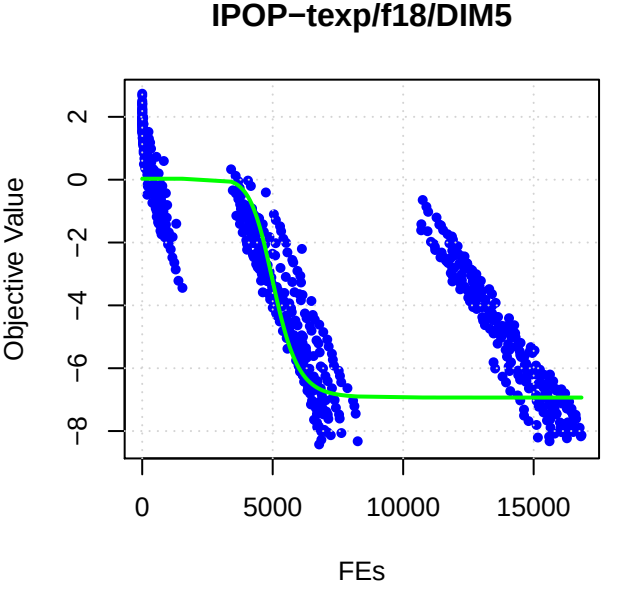
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10000
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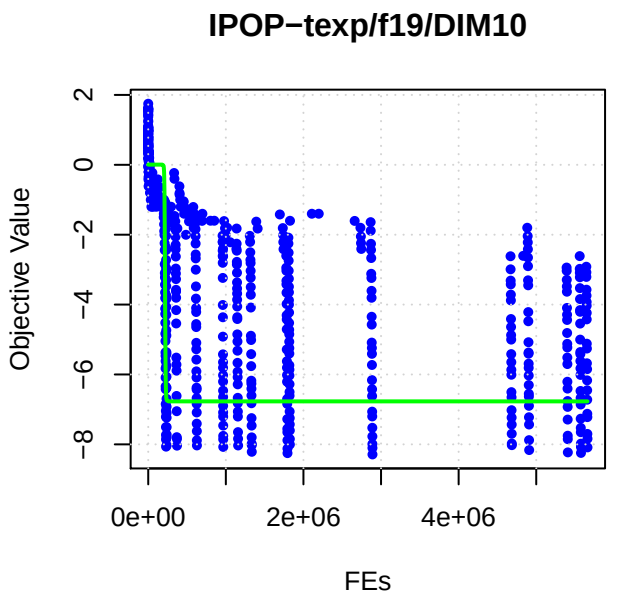
FEs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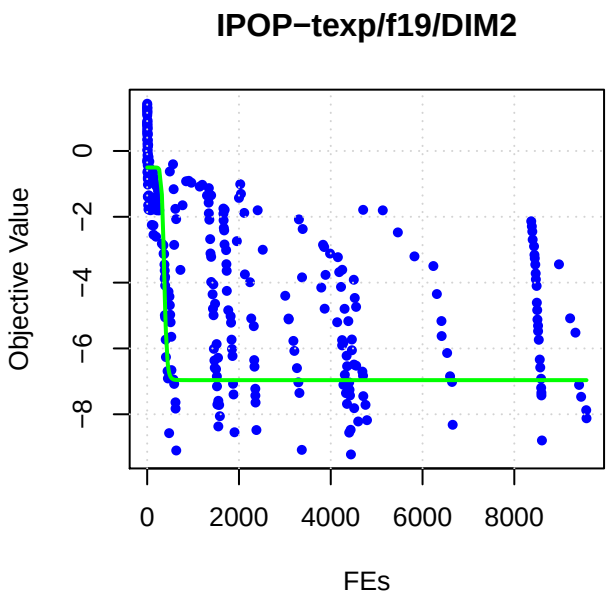
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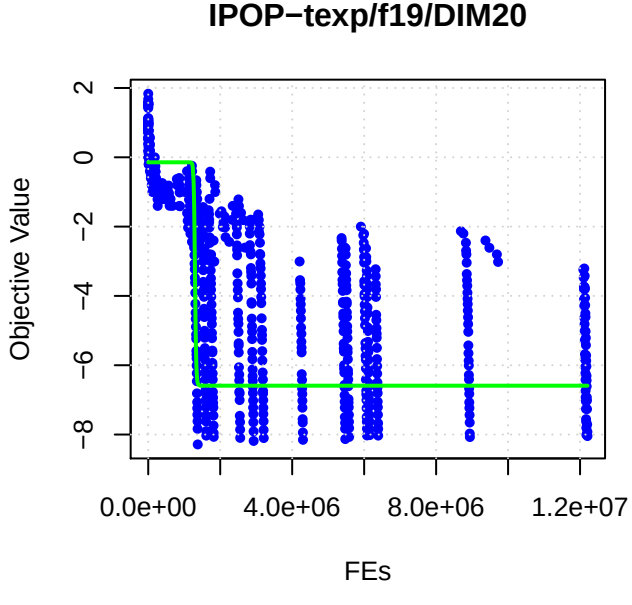
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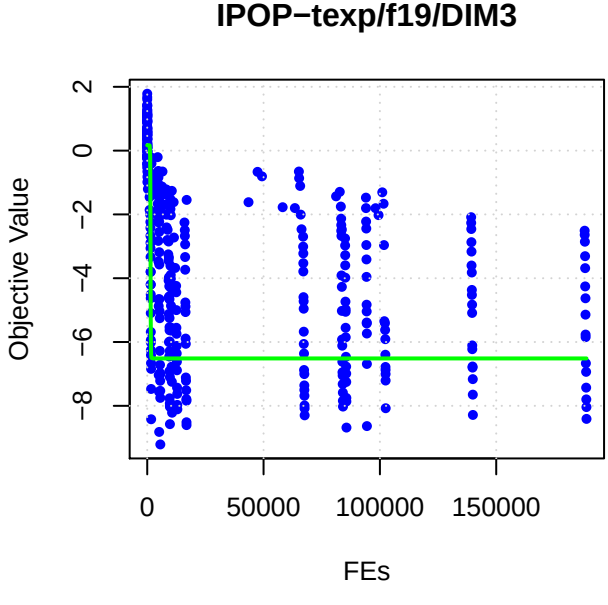
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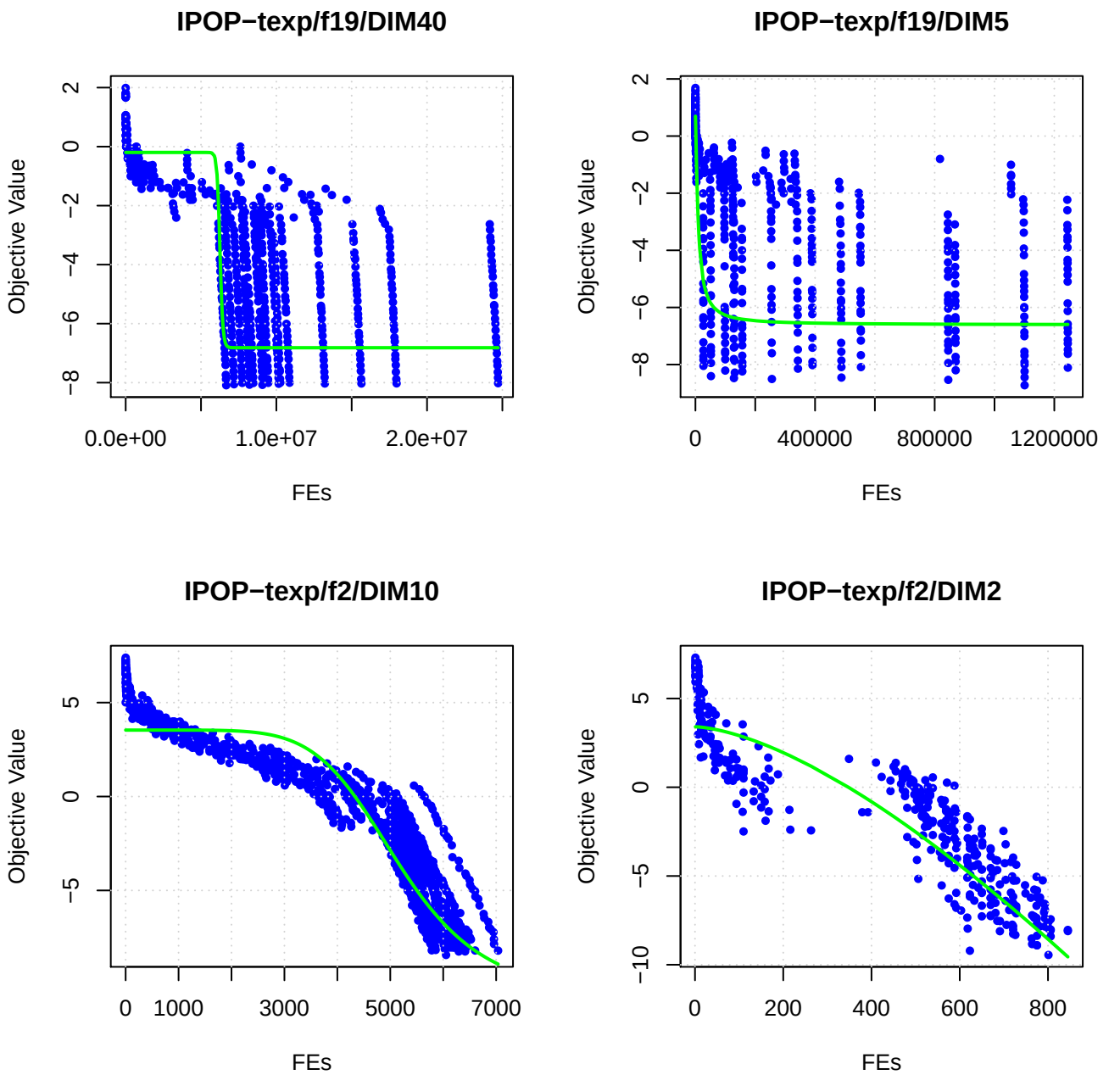
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Objective Value
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1200000
IPOP−texp/f2/DIM10
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3000
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7000
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Objective Value
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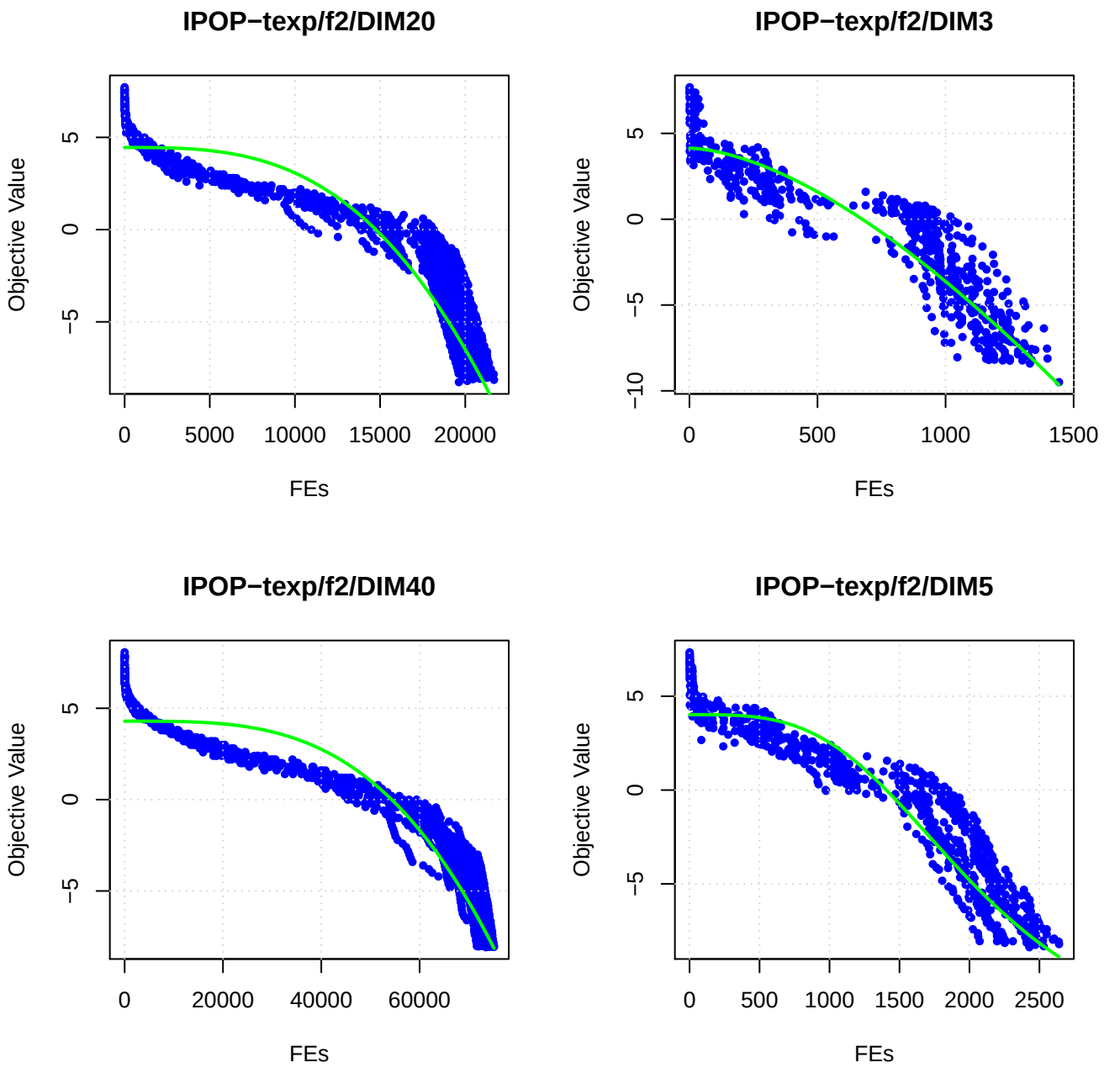
400
600
800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Objective Value
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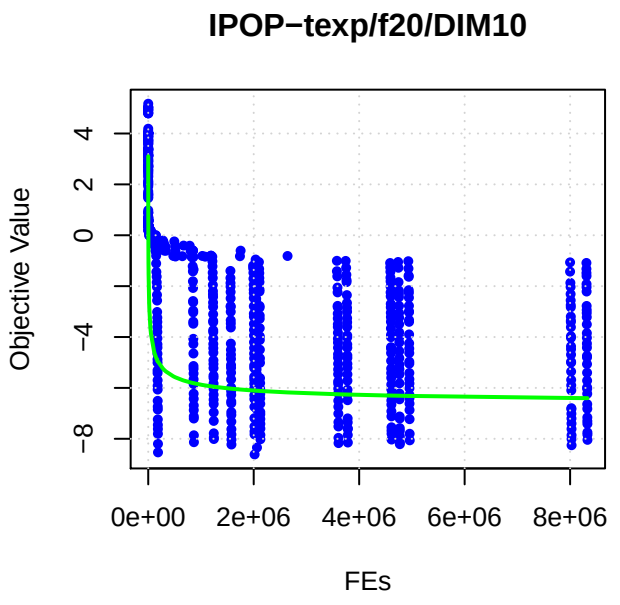
Objective Value
FEs
IPOP−texp/f2/DIM5
Objective Value
FEs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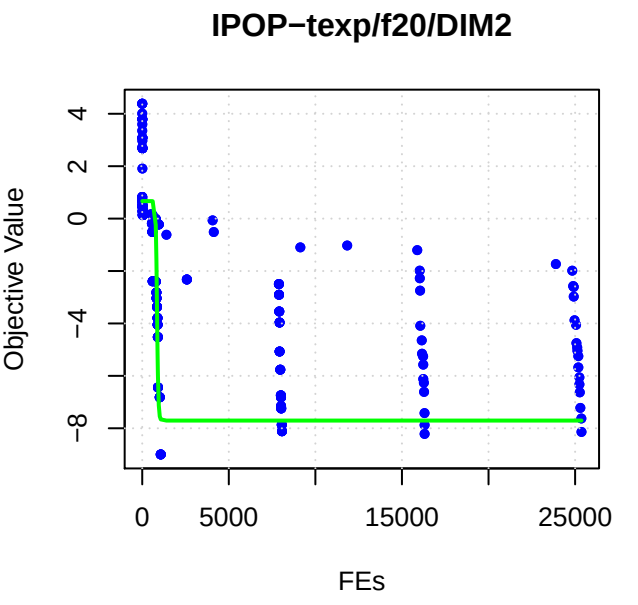
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−8
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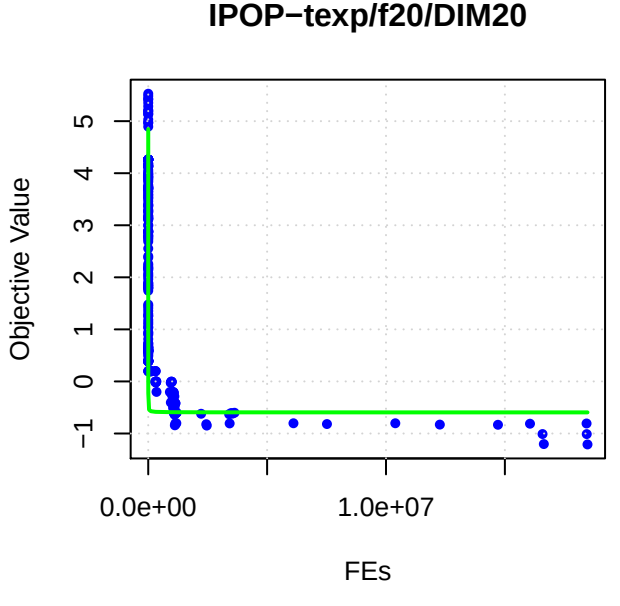
15000
25000
FEs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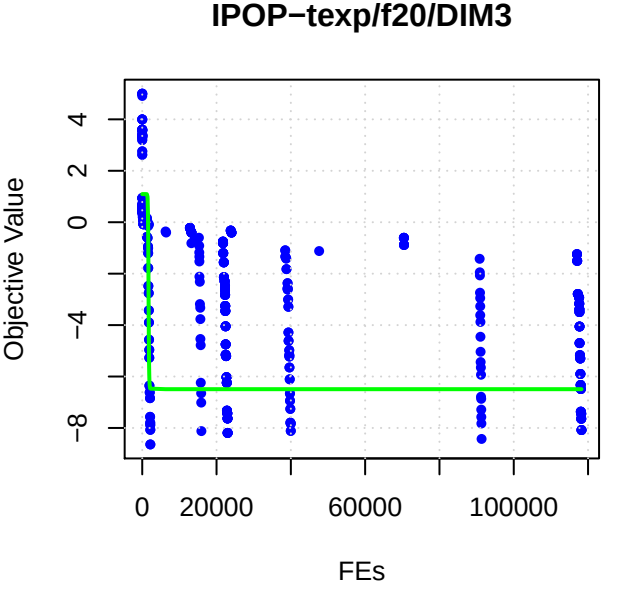
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60000
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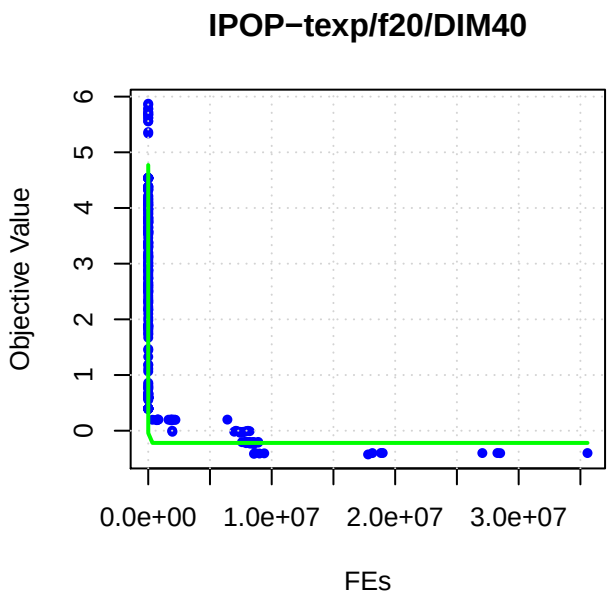
FEs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Objective Value
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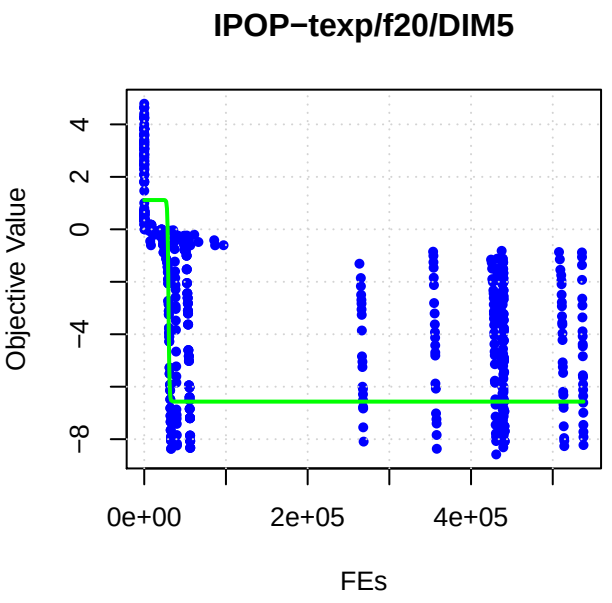
3
4
5
6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Objective Value
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−4
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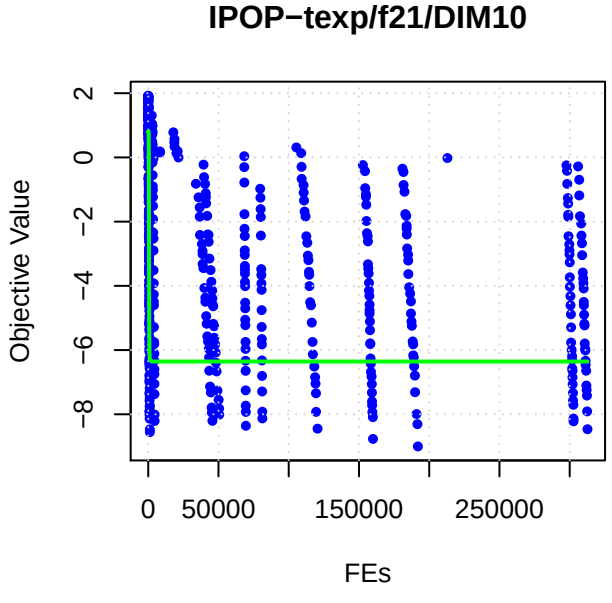
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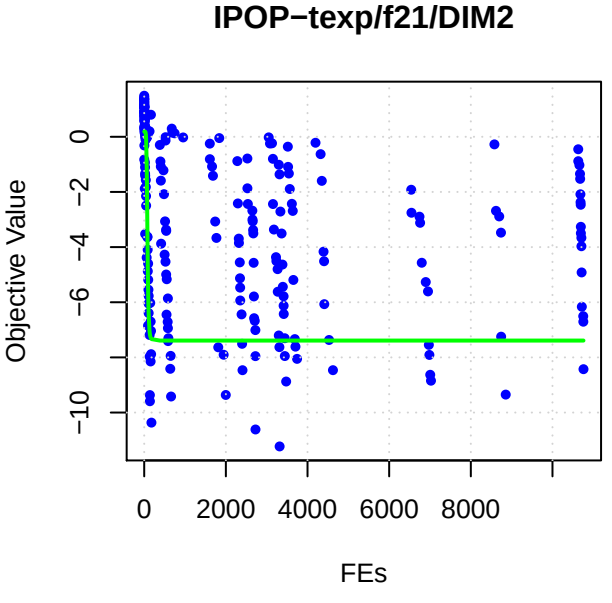
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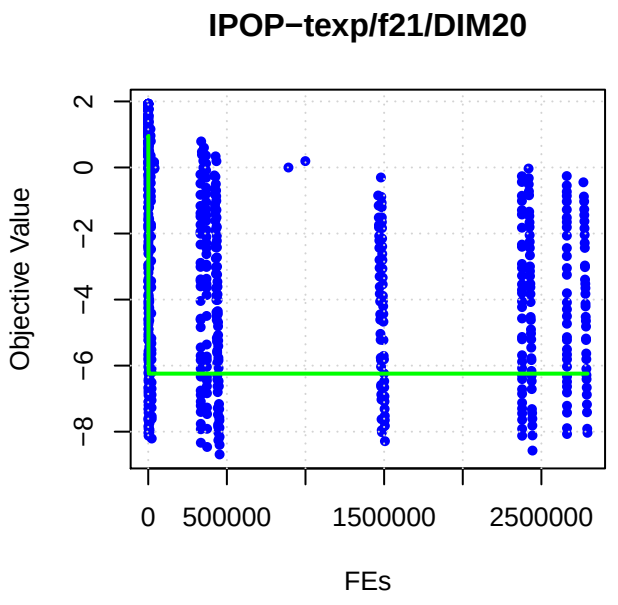
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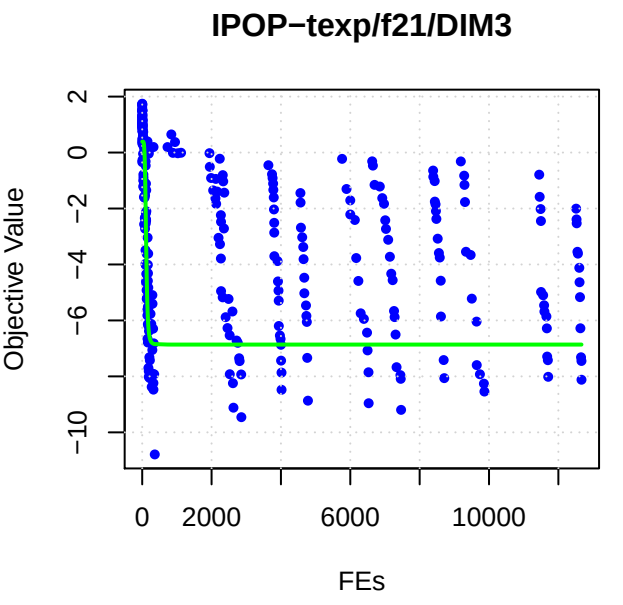
FEs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−10
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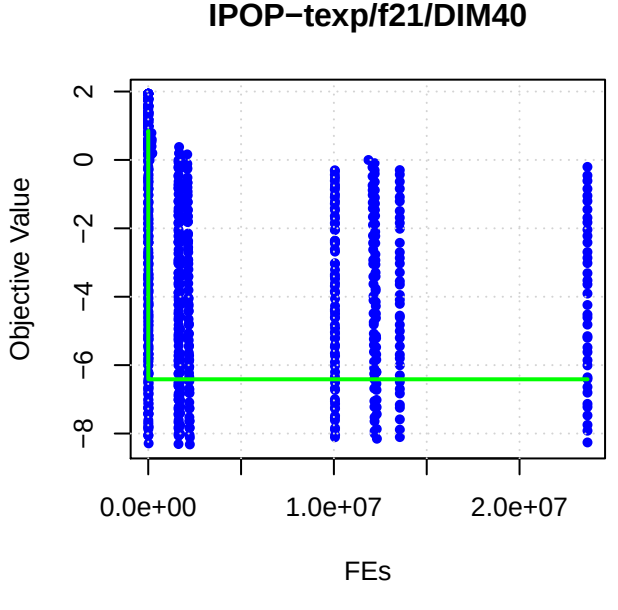
2000
6000
10000
FEs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Objective Value
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−2
−4
−6
−8
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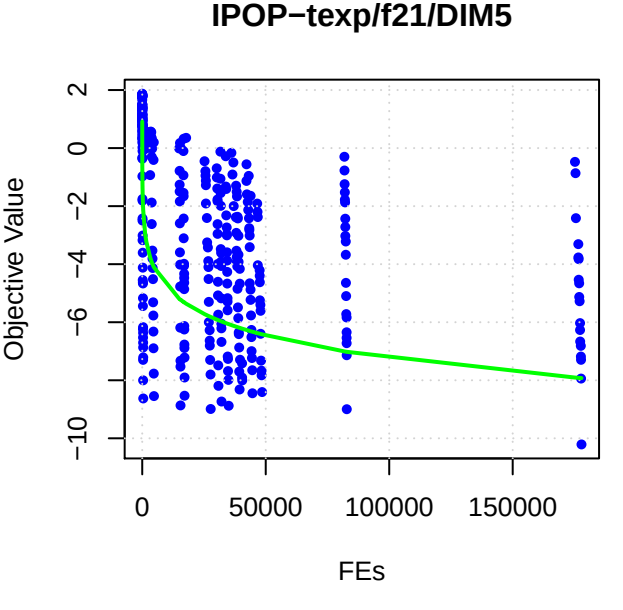
1.0e+07
2.0e+07
FEs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Objective Value
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−6
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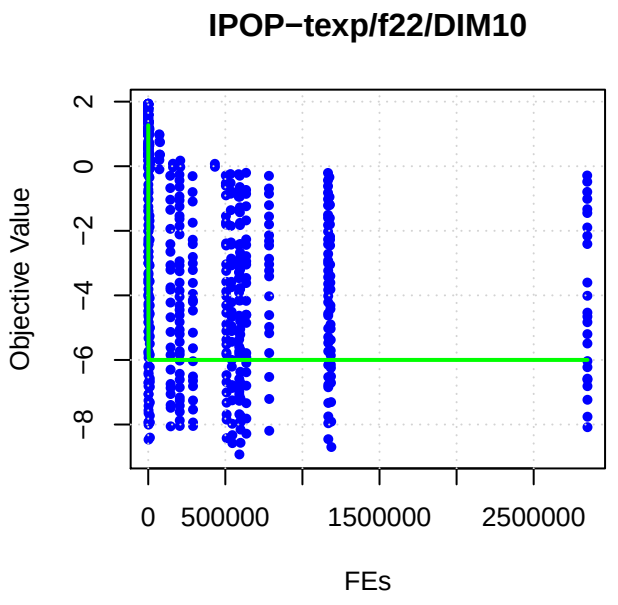
100000
150000
FEs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Objective Value
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−2
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−6
−8
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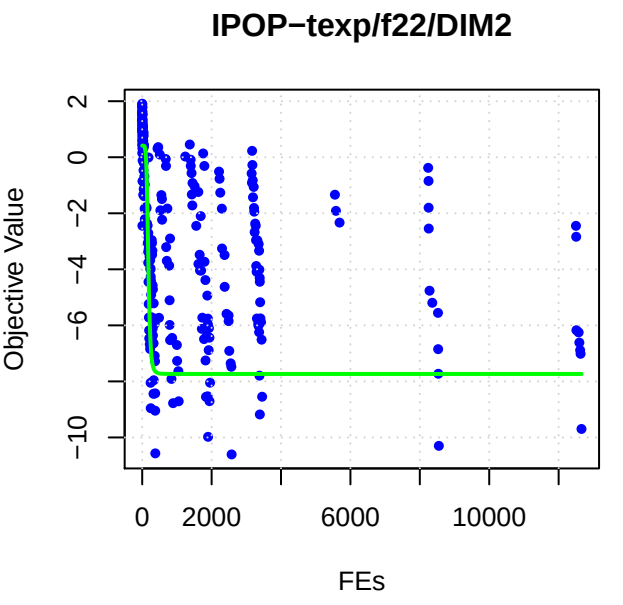
1500000
2500000
FEs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Objective Value
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0
−2
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−6
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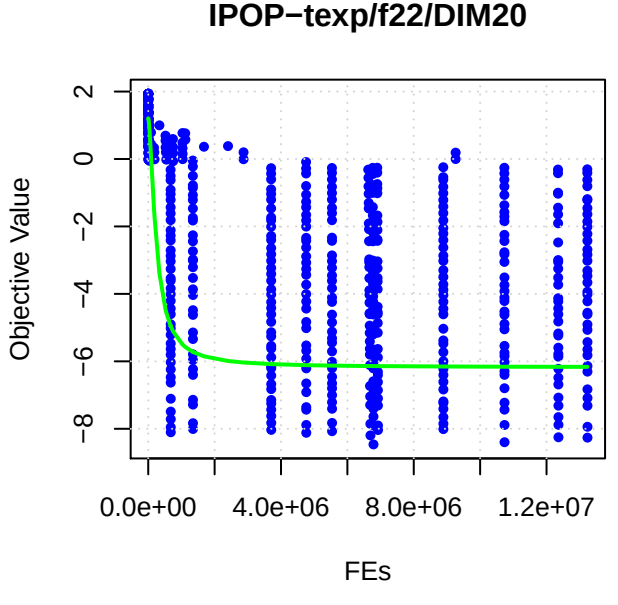
2000
6000
10000
FEs


IPOP−texp/f22/DIM20
Objective Value
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−6
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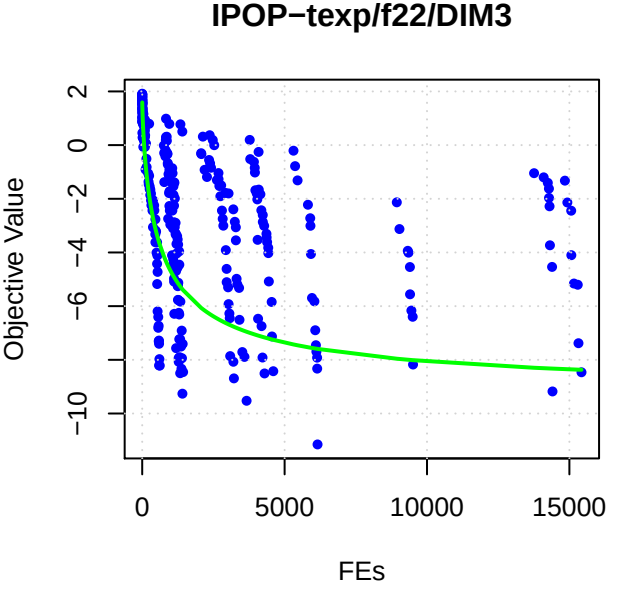
1.2e+07
FEs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Objective Value
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−4
−6
−10
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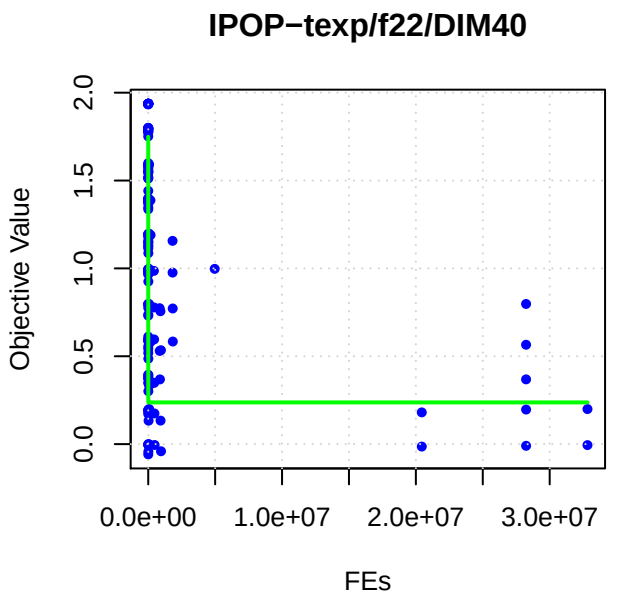
5000
10000
15000
FEs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Objective Value
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1.5
2.0
0.0e+00
1.0e+07
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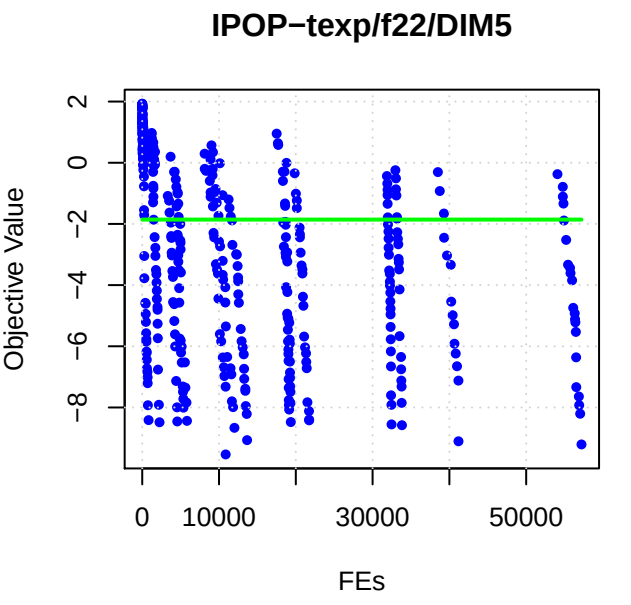
3.0e+07
FEs


IPOP−texp/f22/DIM5
Objective Value
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0
−2
−4
−6
−8
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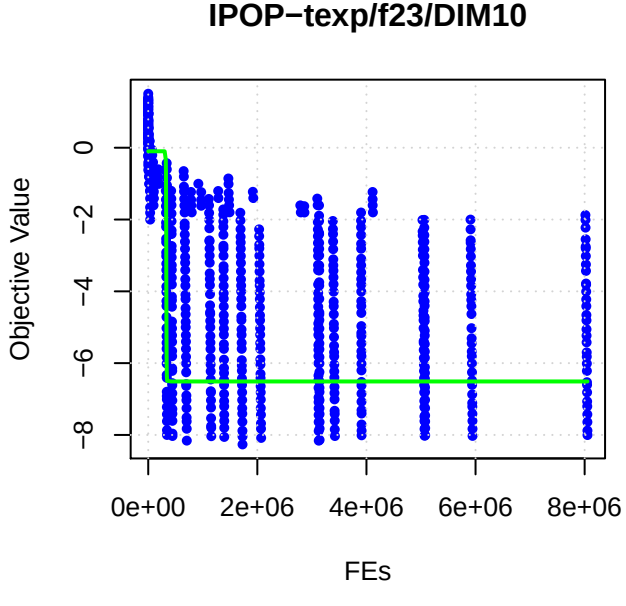
30000
50000
FEs


IPOP−texp/f23/DIM10
Objective Value
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−6
−8
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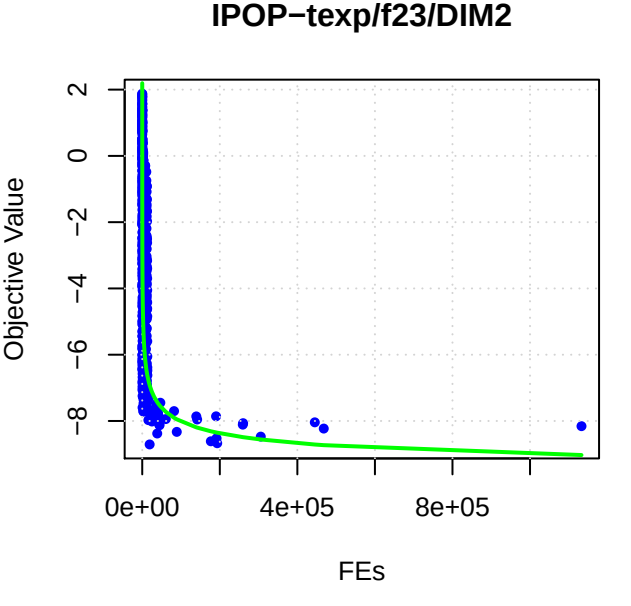
6e+06
8e+06
FEs


IPOP−texp/f23/DIM2
Objective Value
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−2
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−6
−8
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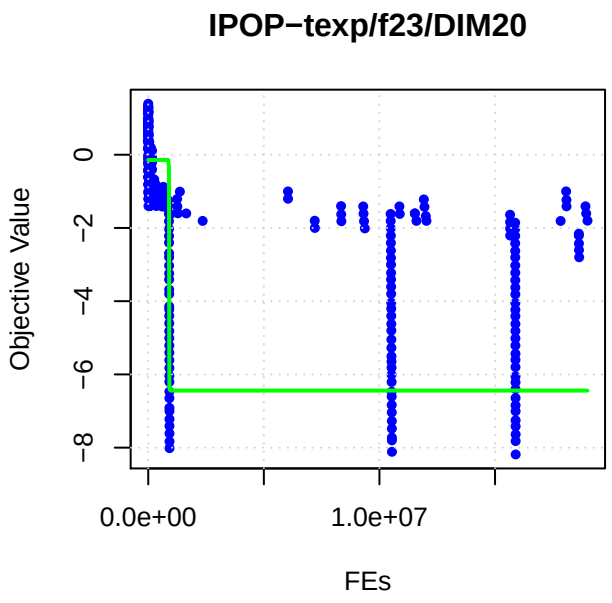
8e+05
FEs


IPOP−texp/f23/DIM20
Objective Value
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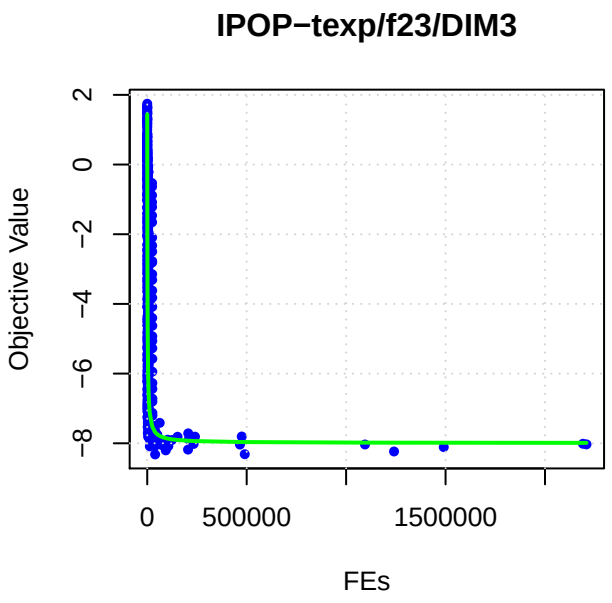
−6
−8
0.0e+00
1.0e+07
FEs


IPOP−texp/f23/DIM3
Objective Value
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−2
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−6
−8
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500000
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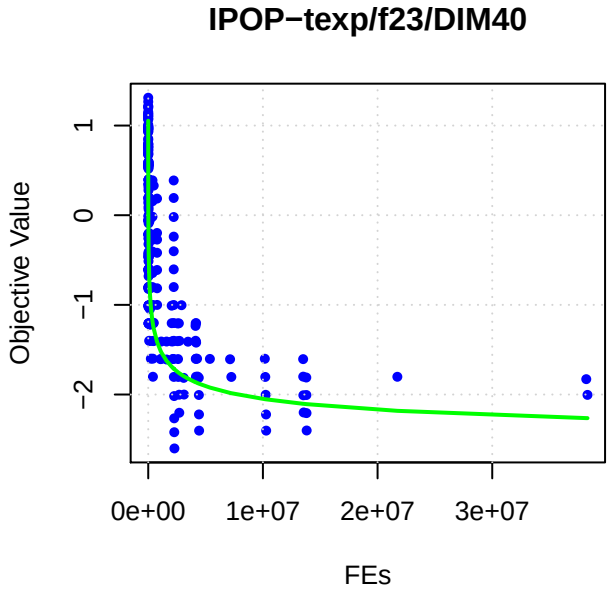
FEs


IPOP−texp/f23/DIM40
Objective Value
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−2
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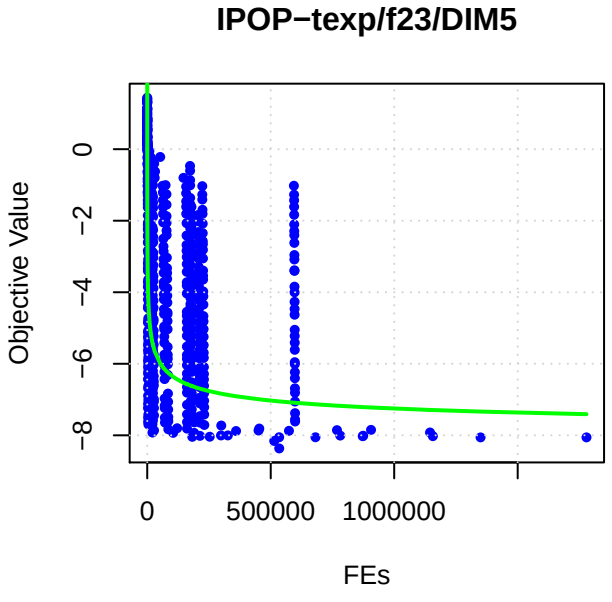
1e+07
2e+07
3e+07
FEs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Objective Value
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−6
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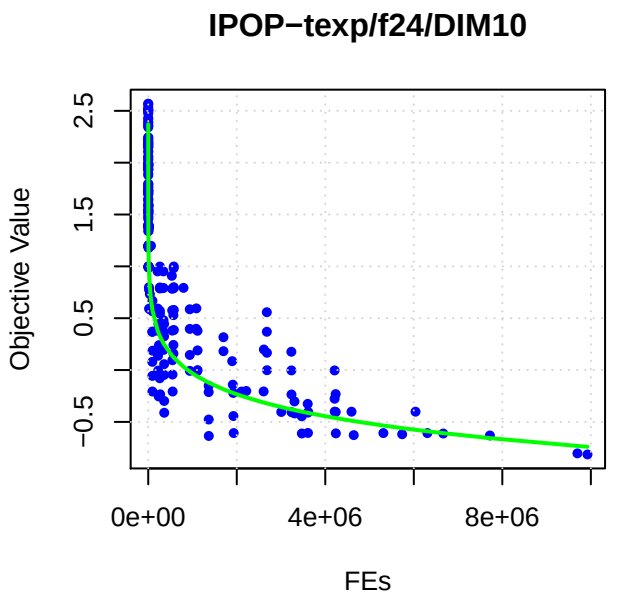
FEs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Objective Value
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0.5
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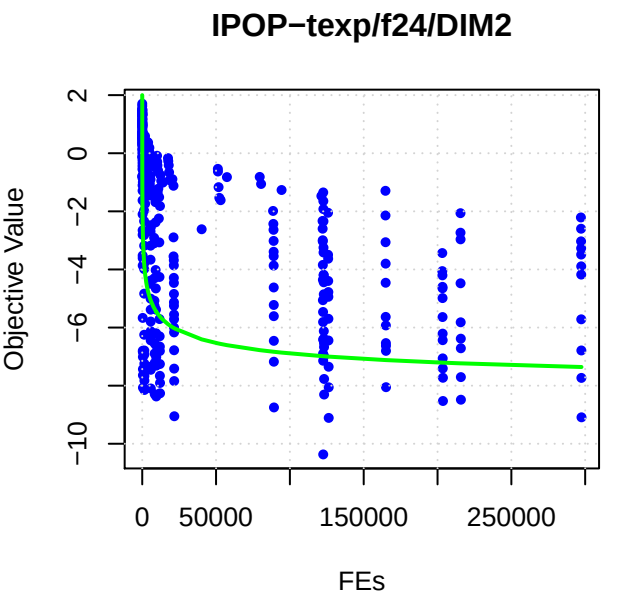
8e+06
FEs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Objective Value
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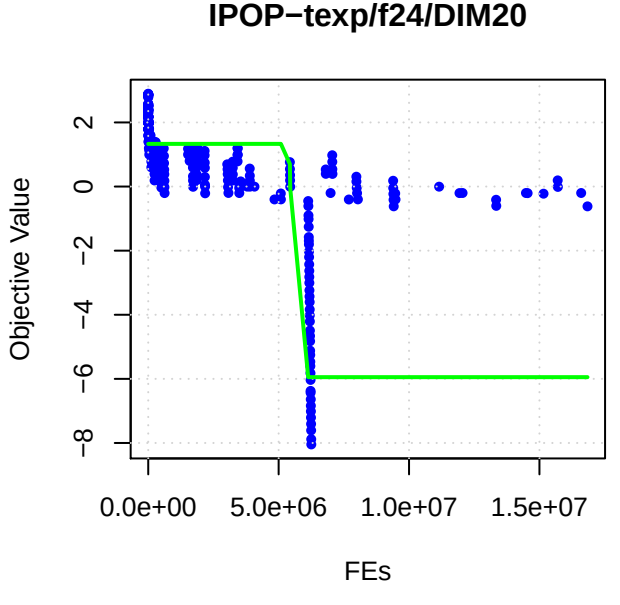
150000
250000
FEs


IPOP−texp/f24/DIM20
Objective Value
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−4
−6
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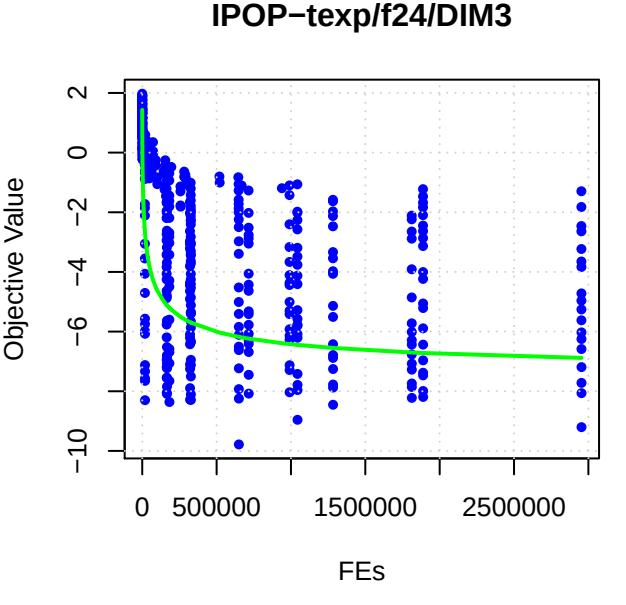
1.0e+07
1.5e+07
FEs


IPOP−texp/f24/DIM3
Objective Value
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1500000
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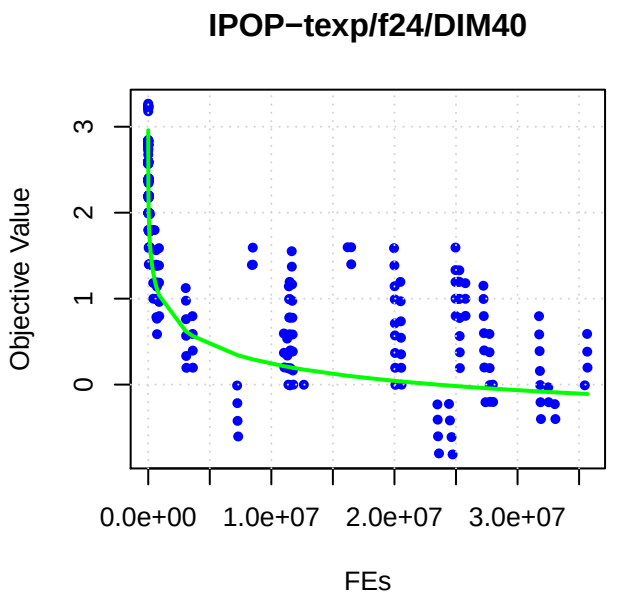
FEs


IPOP−texp/f24/DIM40
Objective Value
FEs
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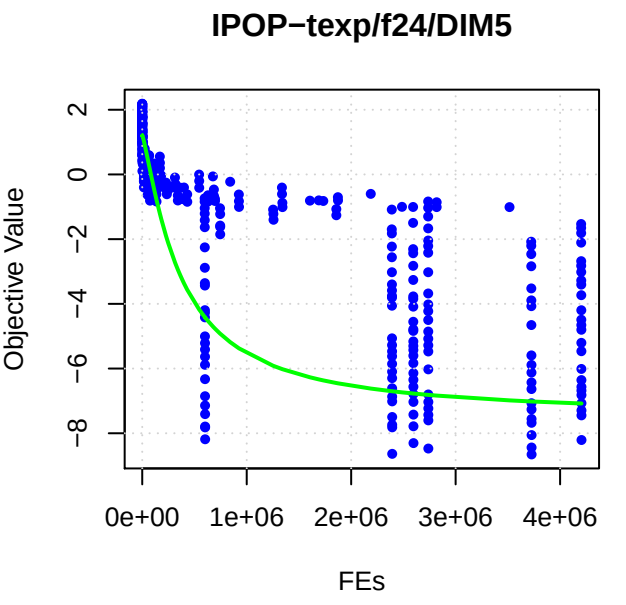
1.0e+07
2.0e+07
3.0e+07
0
1
2
3


IPOP−texp/f24/DIM5
Objective Value
FEs
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1e+06
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−4
−6
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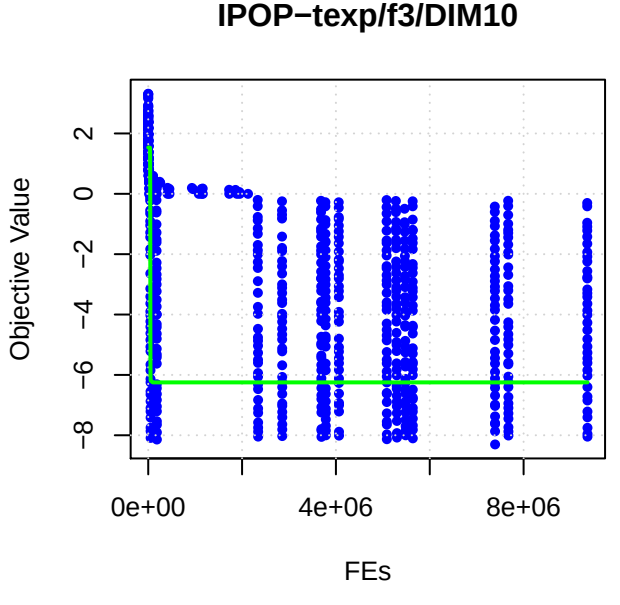
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Objective Value
FEs
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−4
−6
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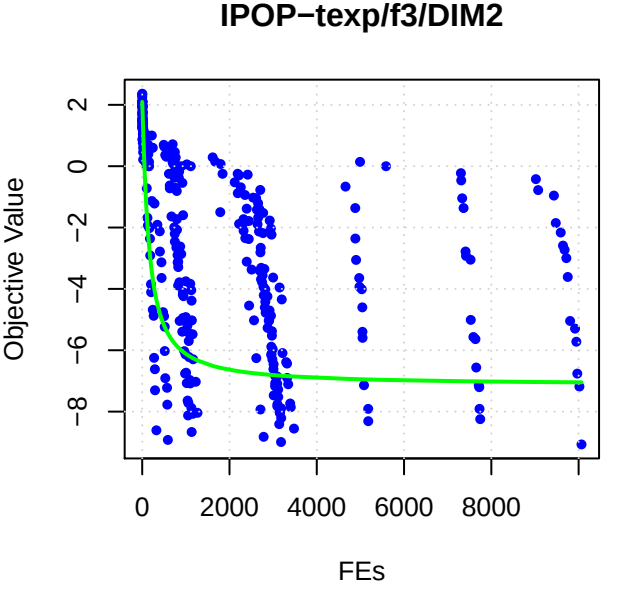
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Objective Value
FEs
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2
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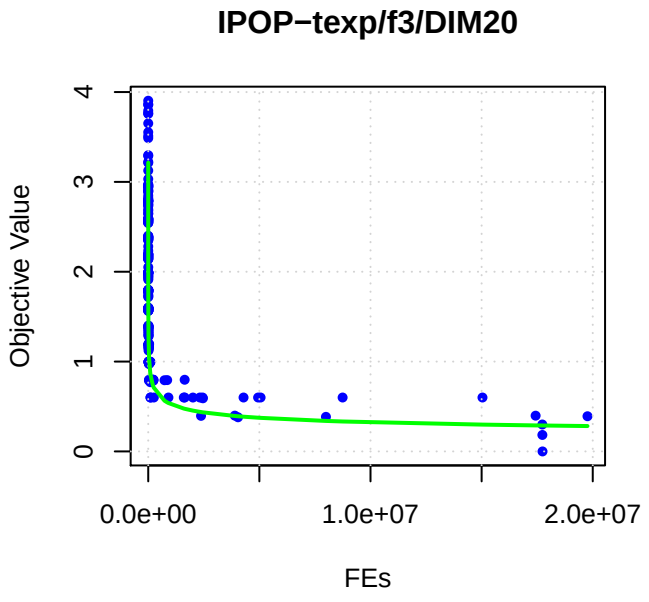
−4
−6
−8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Objective Value
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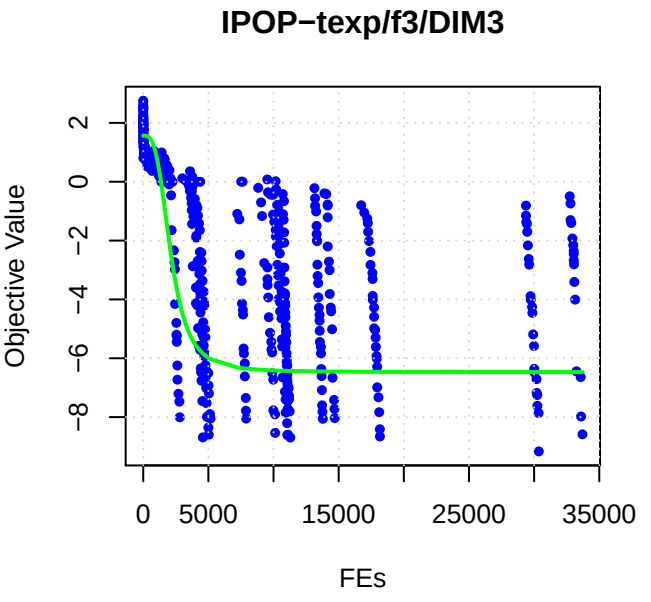
2.0e+07
FEs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2
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15000
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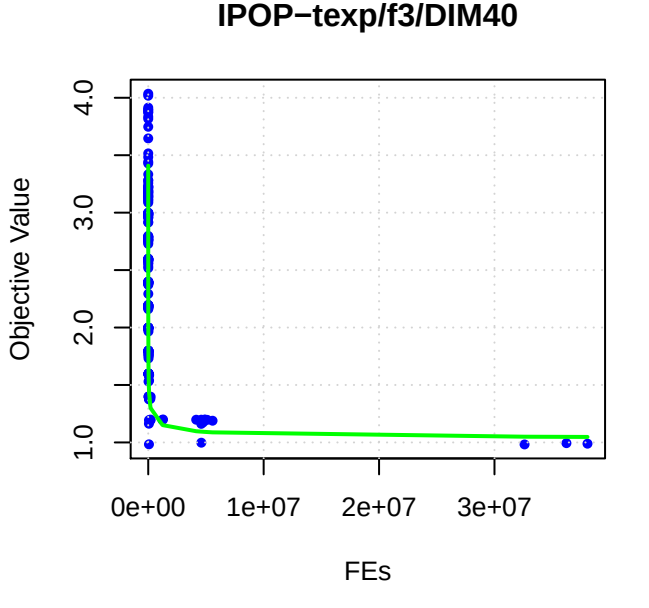
35000
FEs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3.0
4.0
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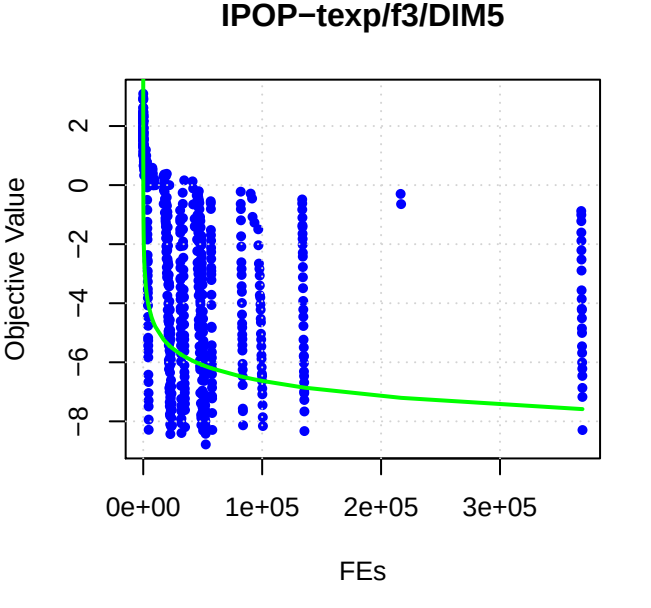
3e+07
FEs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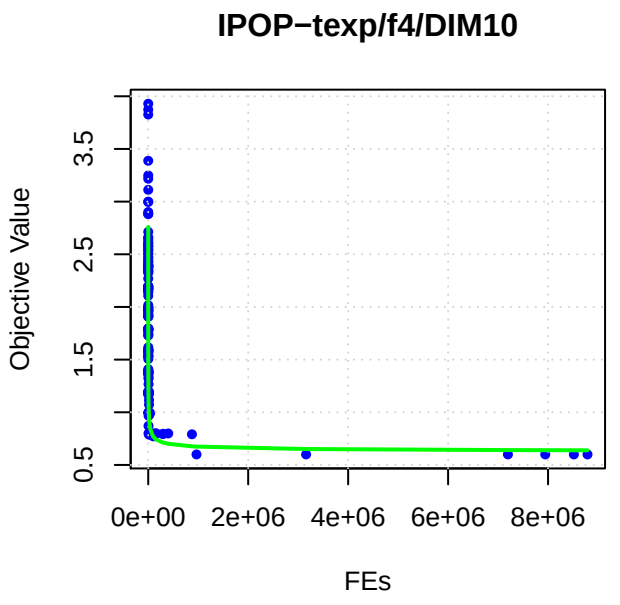
FEs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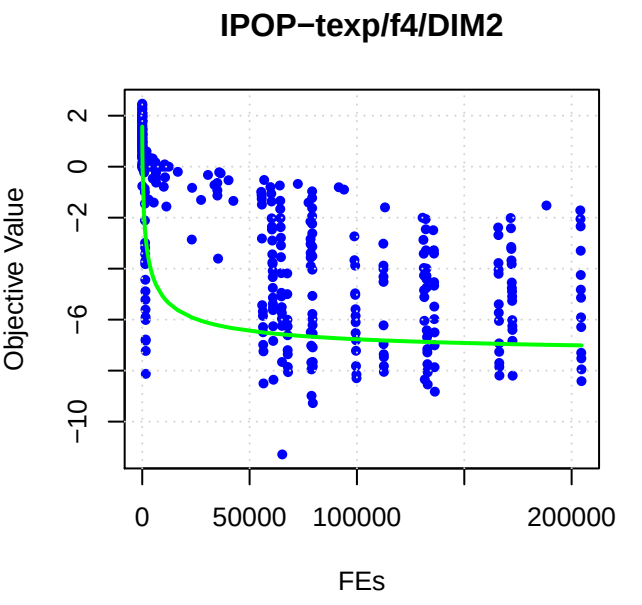
8e+06
FEs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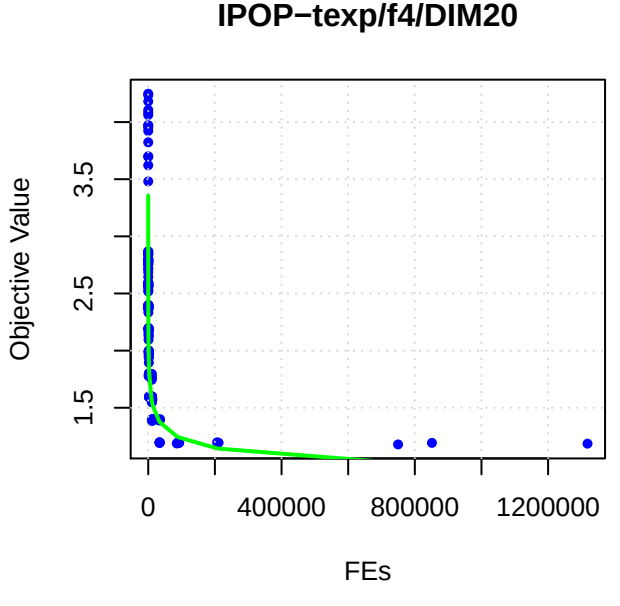
200000
FEs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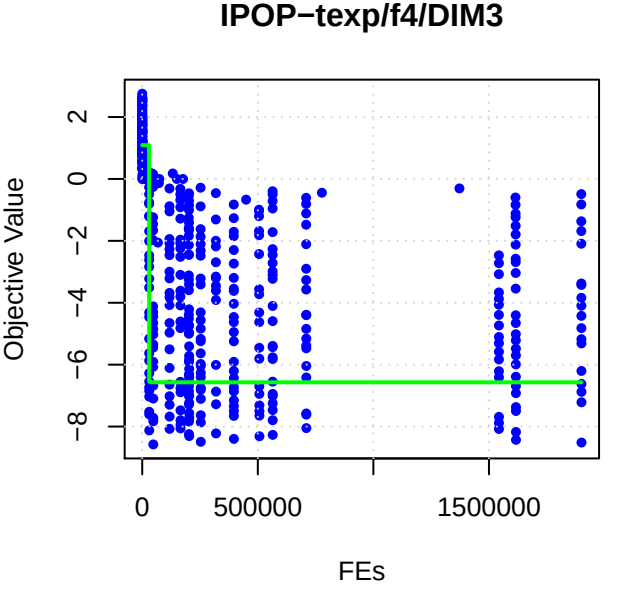
FEs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Objective Value
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−8
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500000
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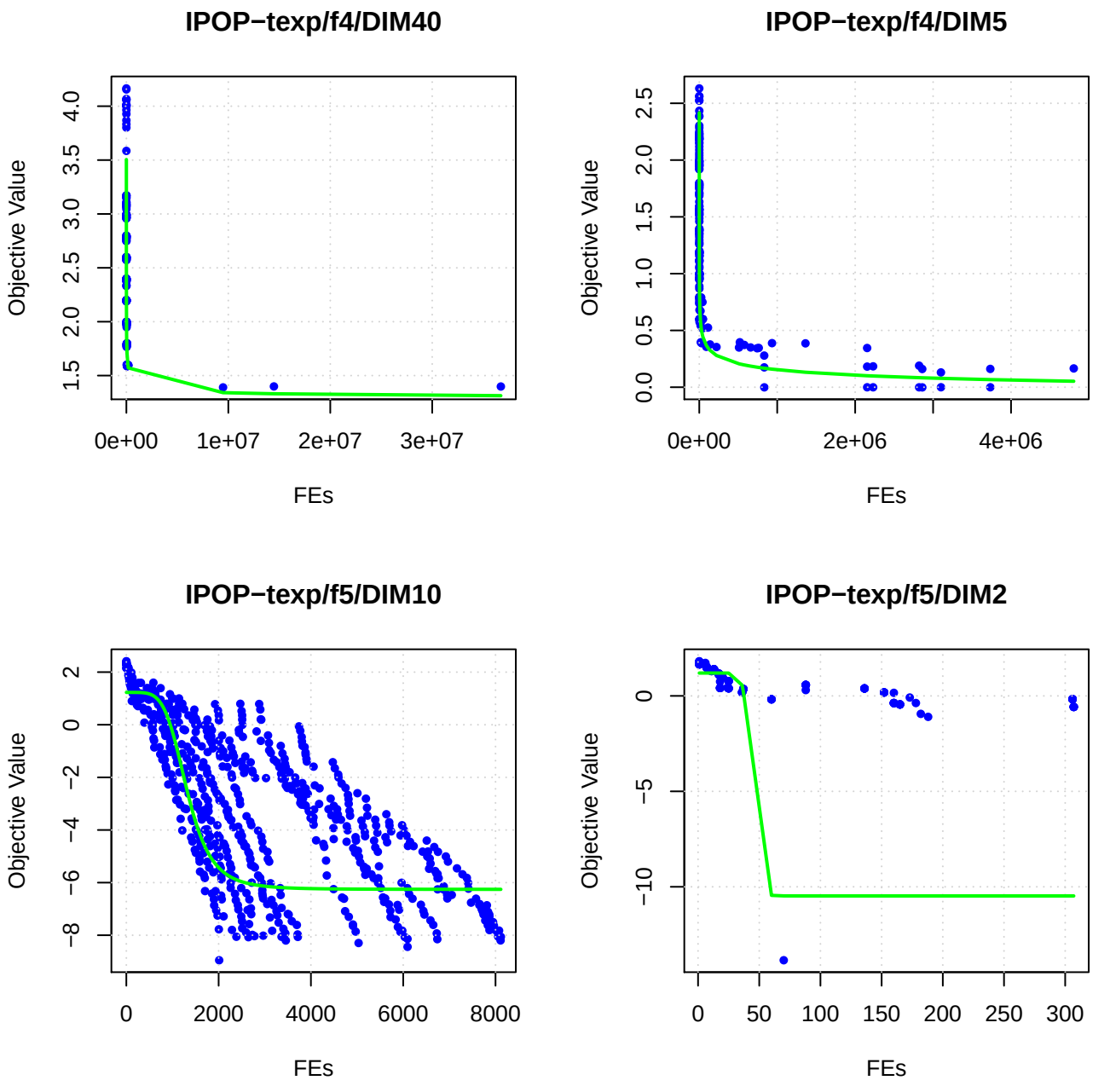
FEs


IPOP−texp/f4/DIM40
Objective Value
FEs
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2e+07
3e+07
1.5
2.0
2.5
3.0
3.5
4.0
IPOP−texp/f4/DIM5
Objective Value
FEs
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2e+06
4e+06
0.0
0.5
1.0
1.5
2.0
2.5
IPOP−texp/f5/DIM10
Objective Value
FEs
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4000
6000
8000
−8
−6
−4
−2
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Objective Value
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150
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300
−10
−5
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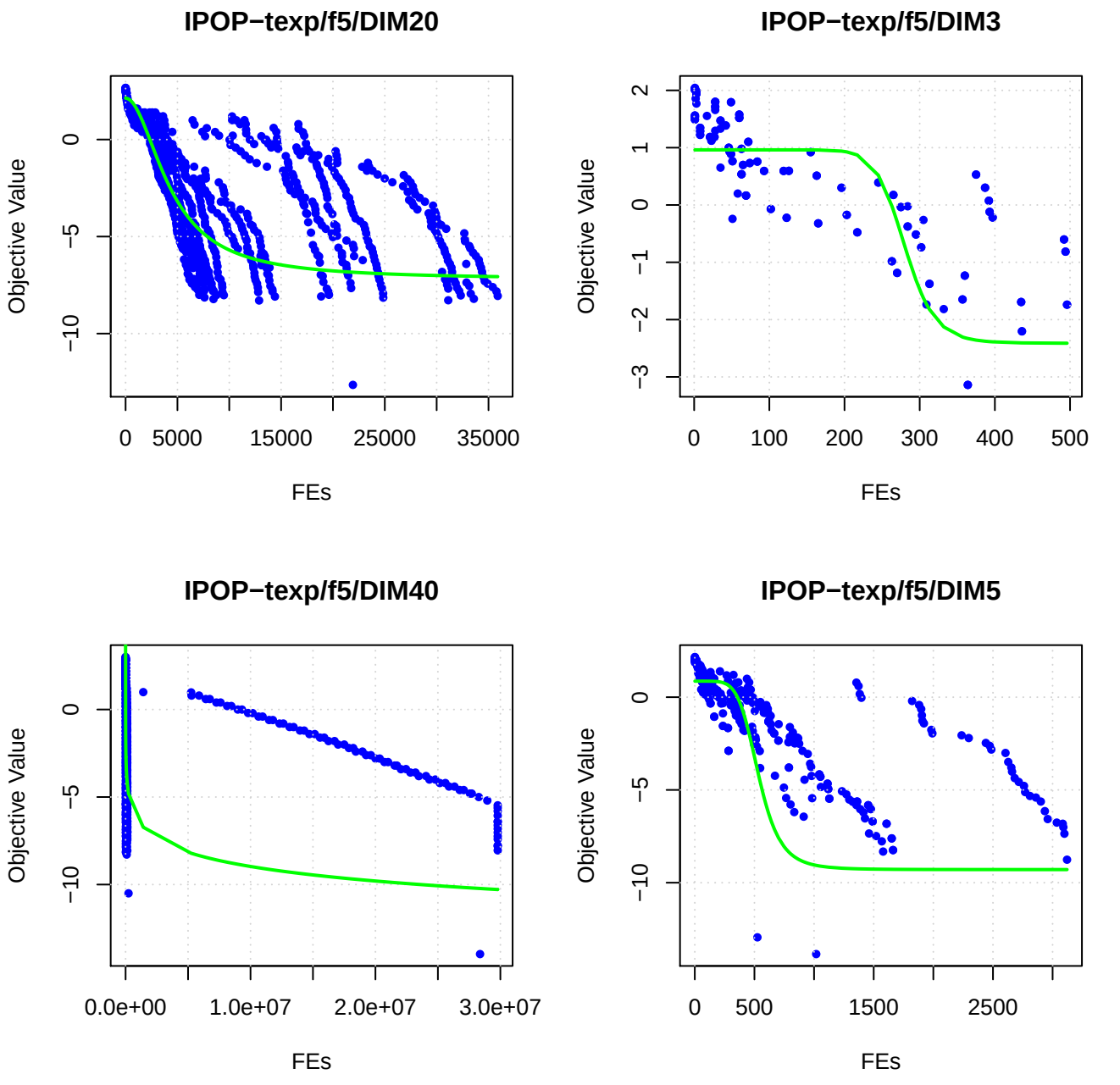
IPOP−texp/f5/DIM20
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15000
25000
35000
FEs
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Objective Value
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0
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−2
−3
0
100
200
300
400
500
FEs
IPOP−texp/f5/DIM40
Objective Value
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−10
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2.0e+07
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Objective Value
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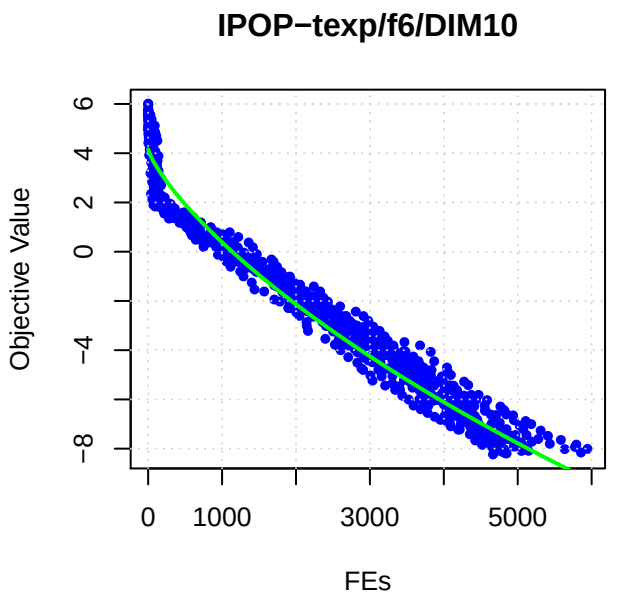
2500
FEs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Objective Value
FEs
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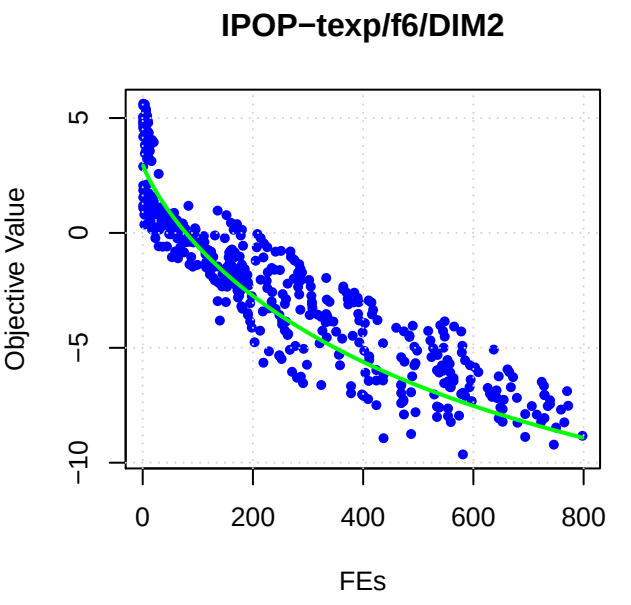
2
0
−4
−8
0
1000
3000
5000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Objective Value
FEs
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−5
−10
0
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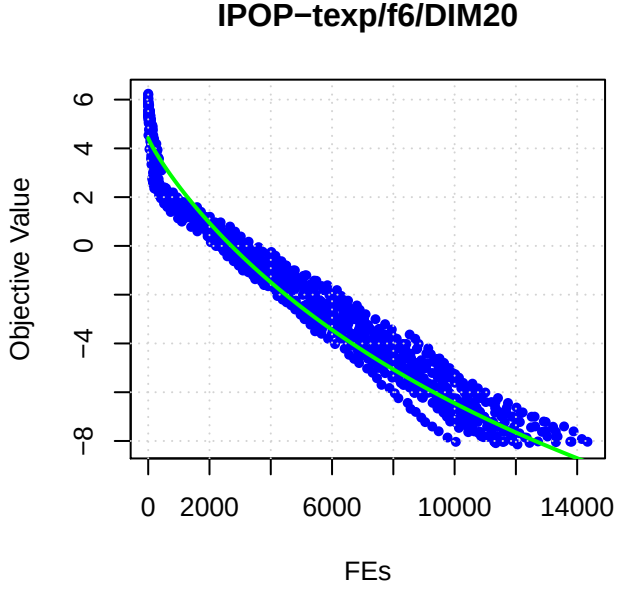
400
600
800


IPOP−texp/f6/DIM20
Objective Value
FEs
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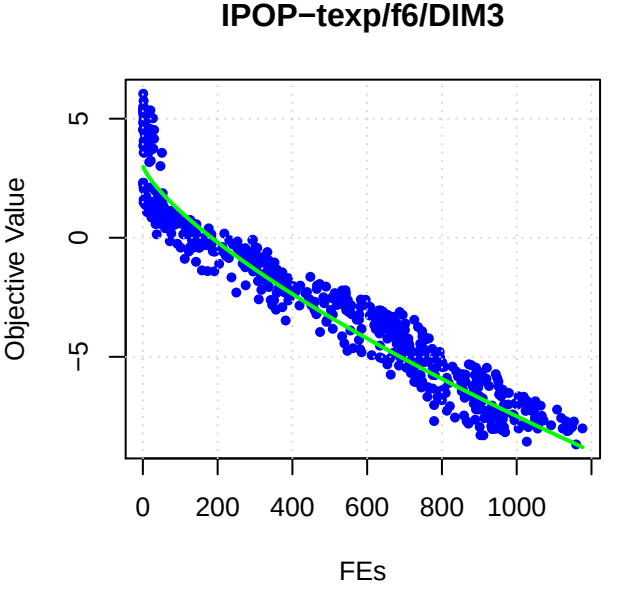
14000


IPOP−texp/f6/DIM3
Objective Value
FEs
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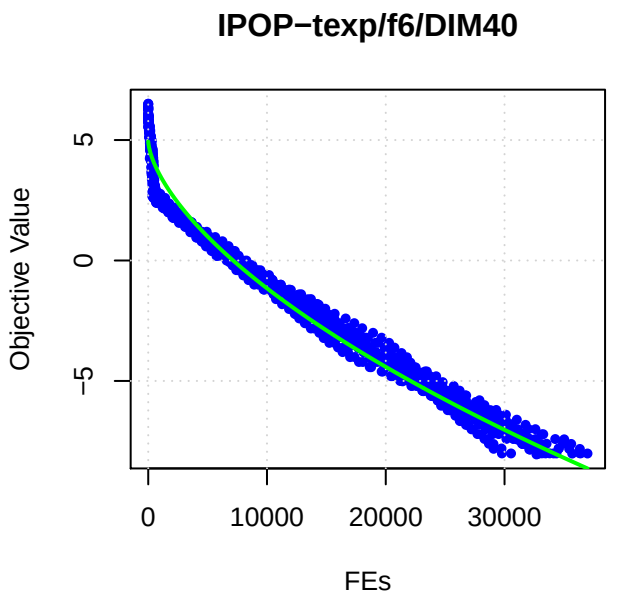
400
600
800
1000


IPOP−texp/f6/DIM40
Objective Value
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−5
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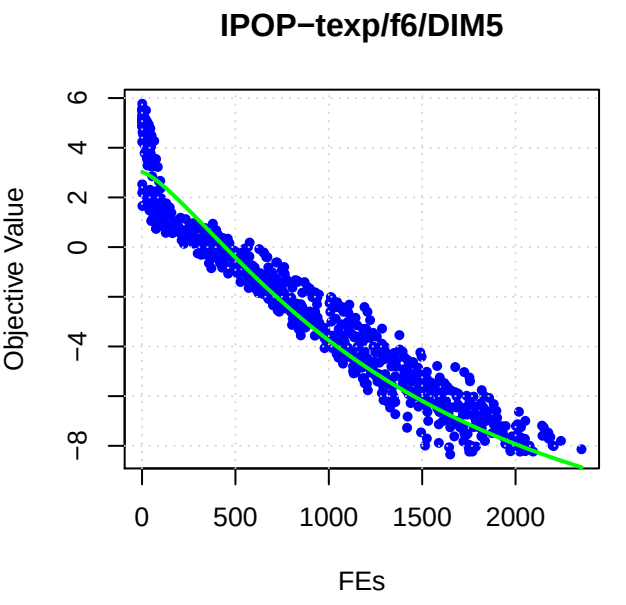
20000
30000
FEs


IPOP−texp/f6/DIM5
Objective Value
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2
0
−4
−8
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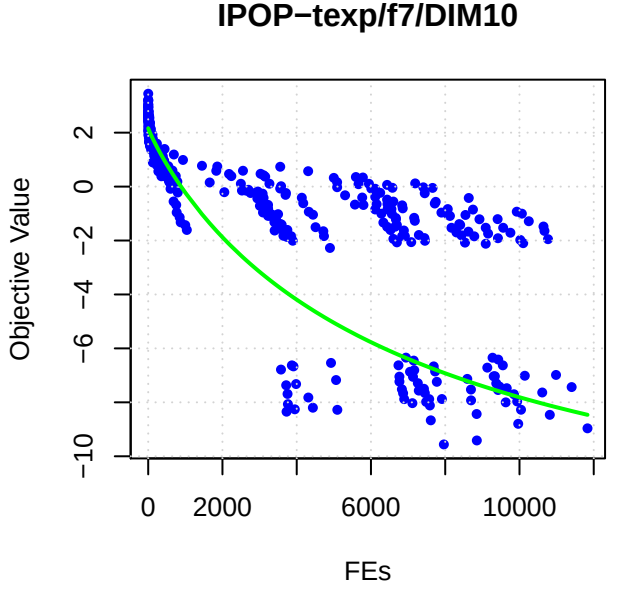
500
1000
1500
2000
FEs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Objective Value
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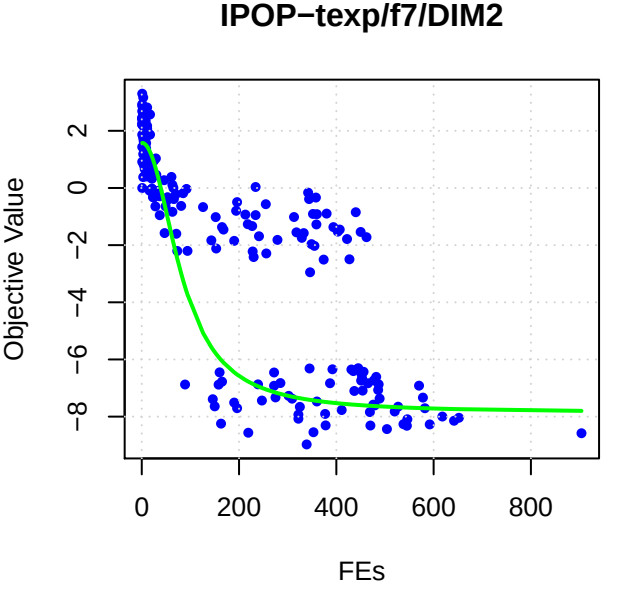
6000
10000
FEs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Objective Value
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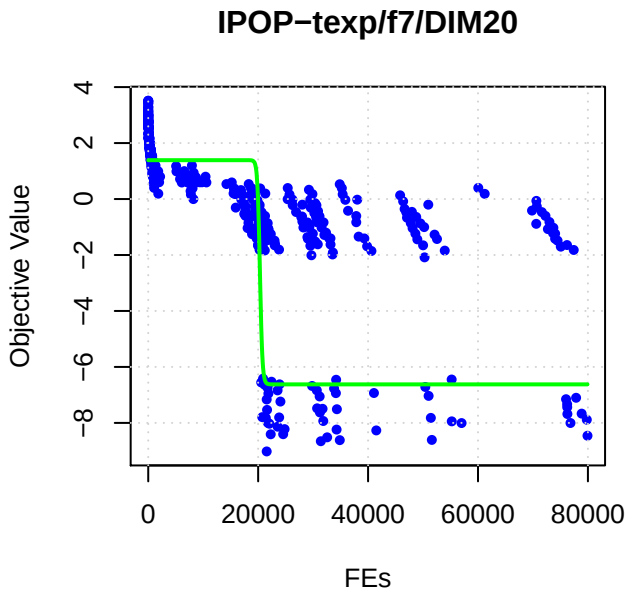
600
800
FEs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Objective Value
FEs
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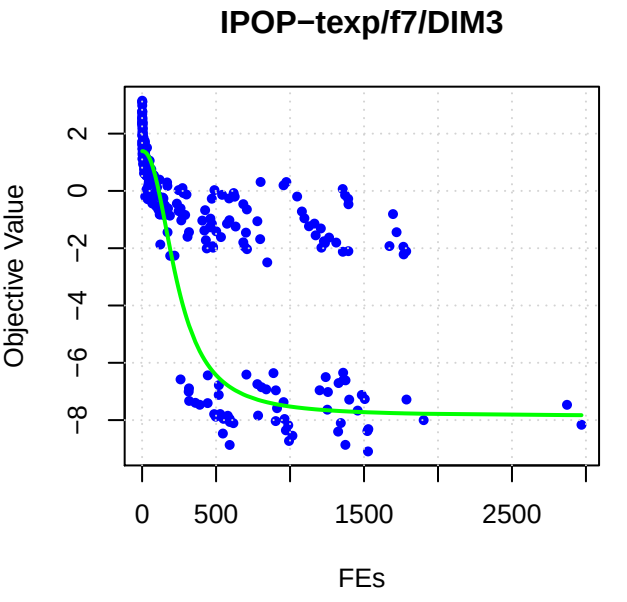
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Objective Value
FEs
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−6
−8
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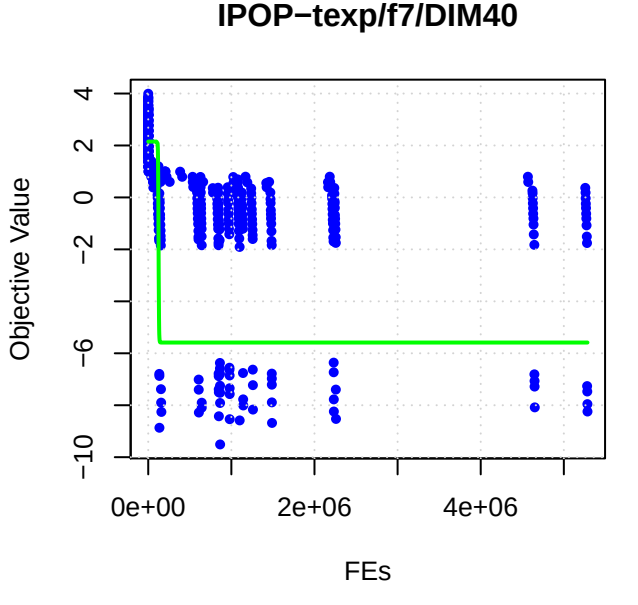
1500
2500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−6
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2e+06
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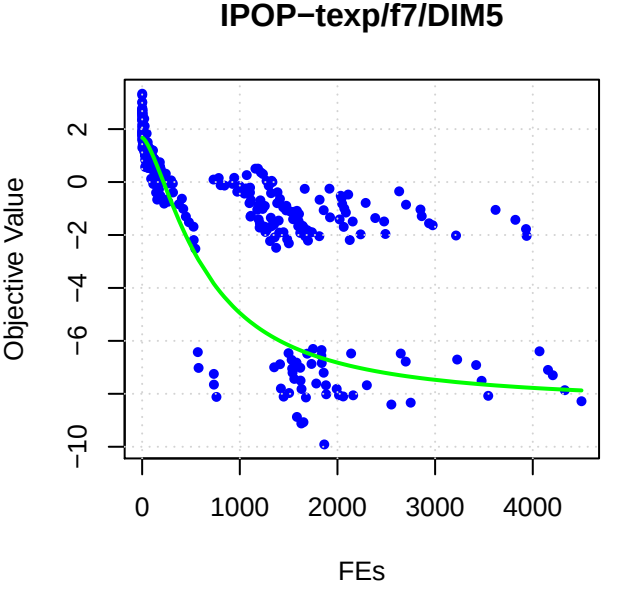
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Objective Value
FEs
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−6
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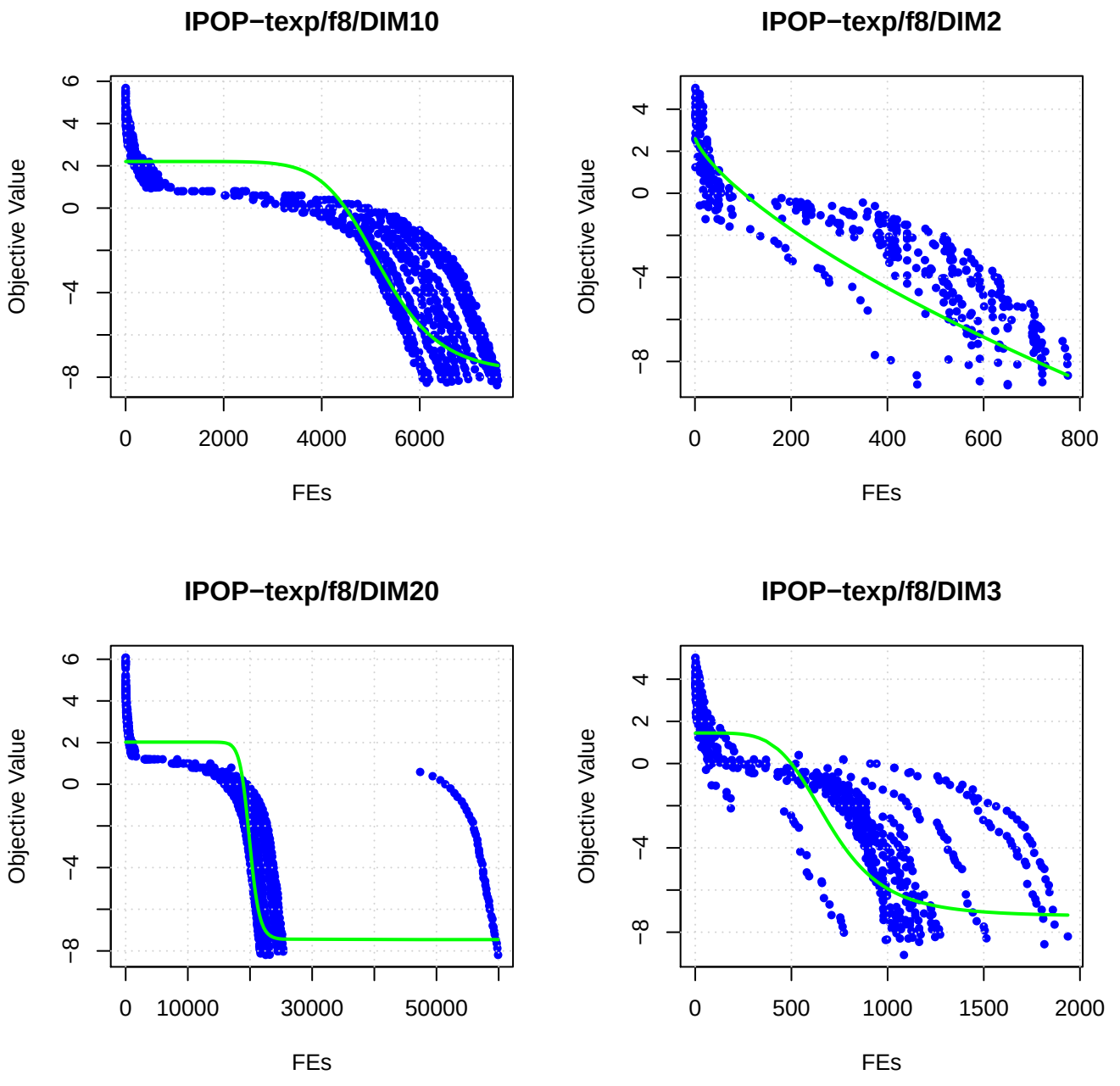
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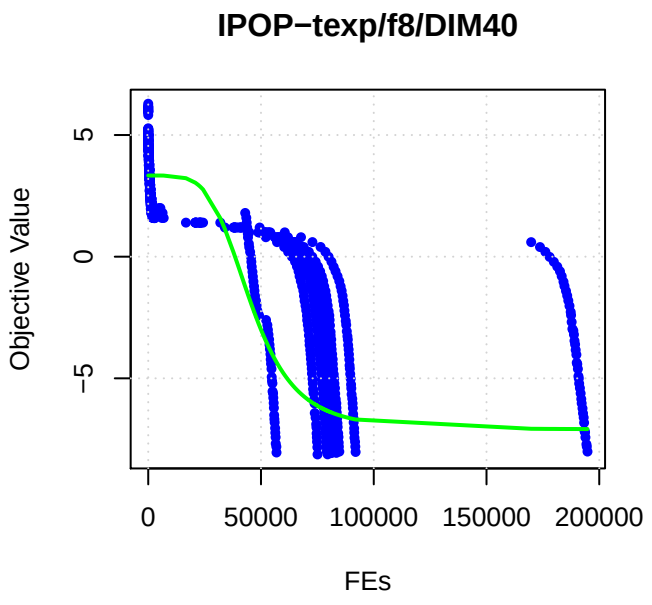
Objective Value
FEs
IPOP−texp/f8/DIM2
Objective Value
FEs
IPOP−texp/f8/DIM20
Objective Value
FEs
IPOP−texp/f8/DIM3
Objective Value
FEs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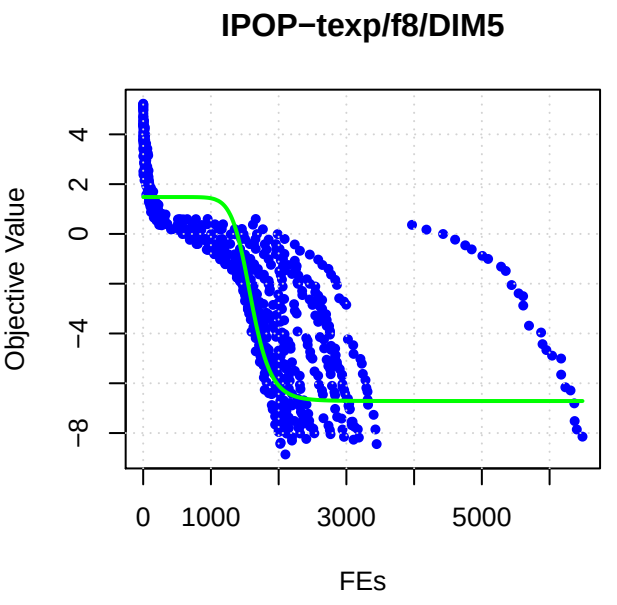
150000
200000
FEs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Objective Value
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−4
−8
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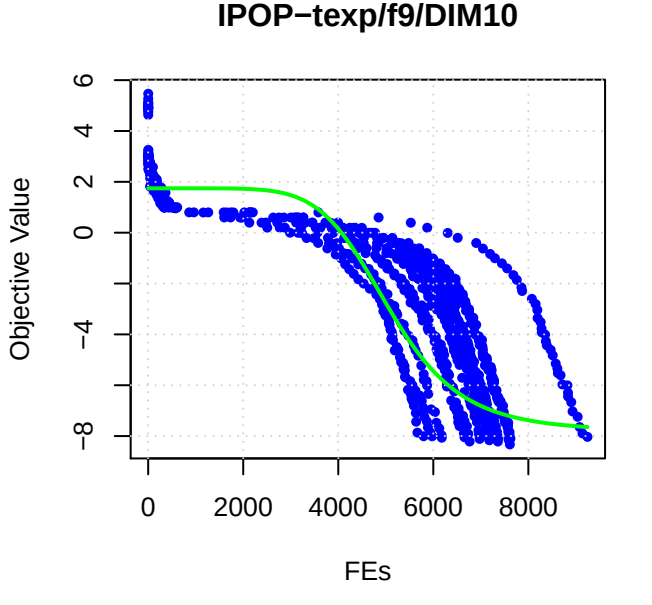
3000
5000
FEs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Objective Value
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4
2
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−4
−8
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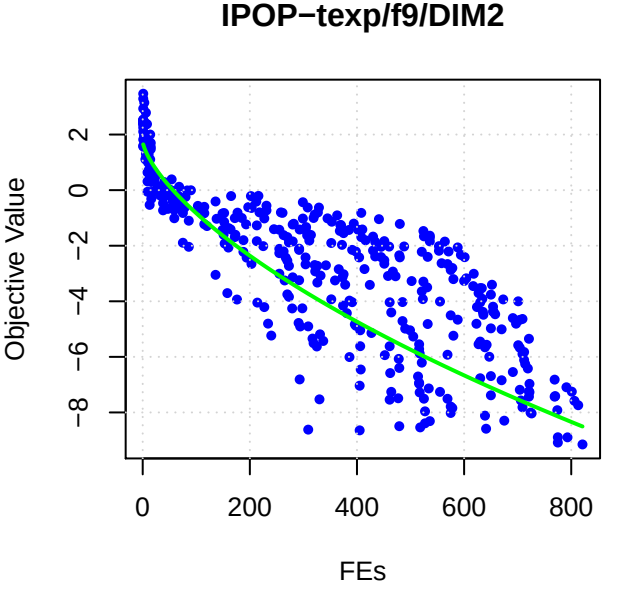
4000
6000
8000
FEs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Objective Value
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−6
−8
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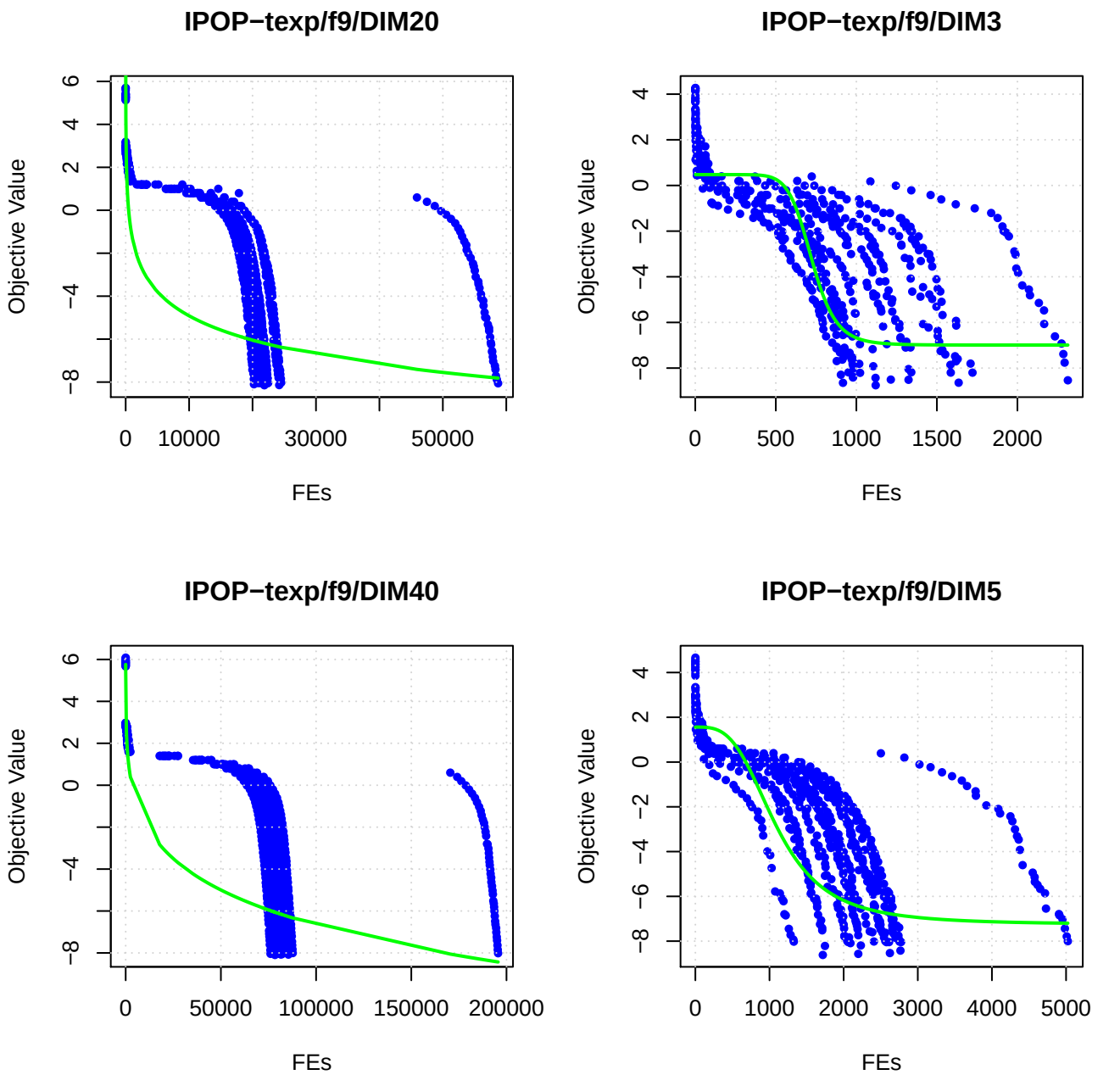
400
600
800
FEs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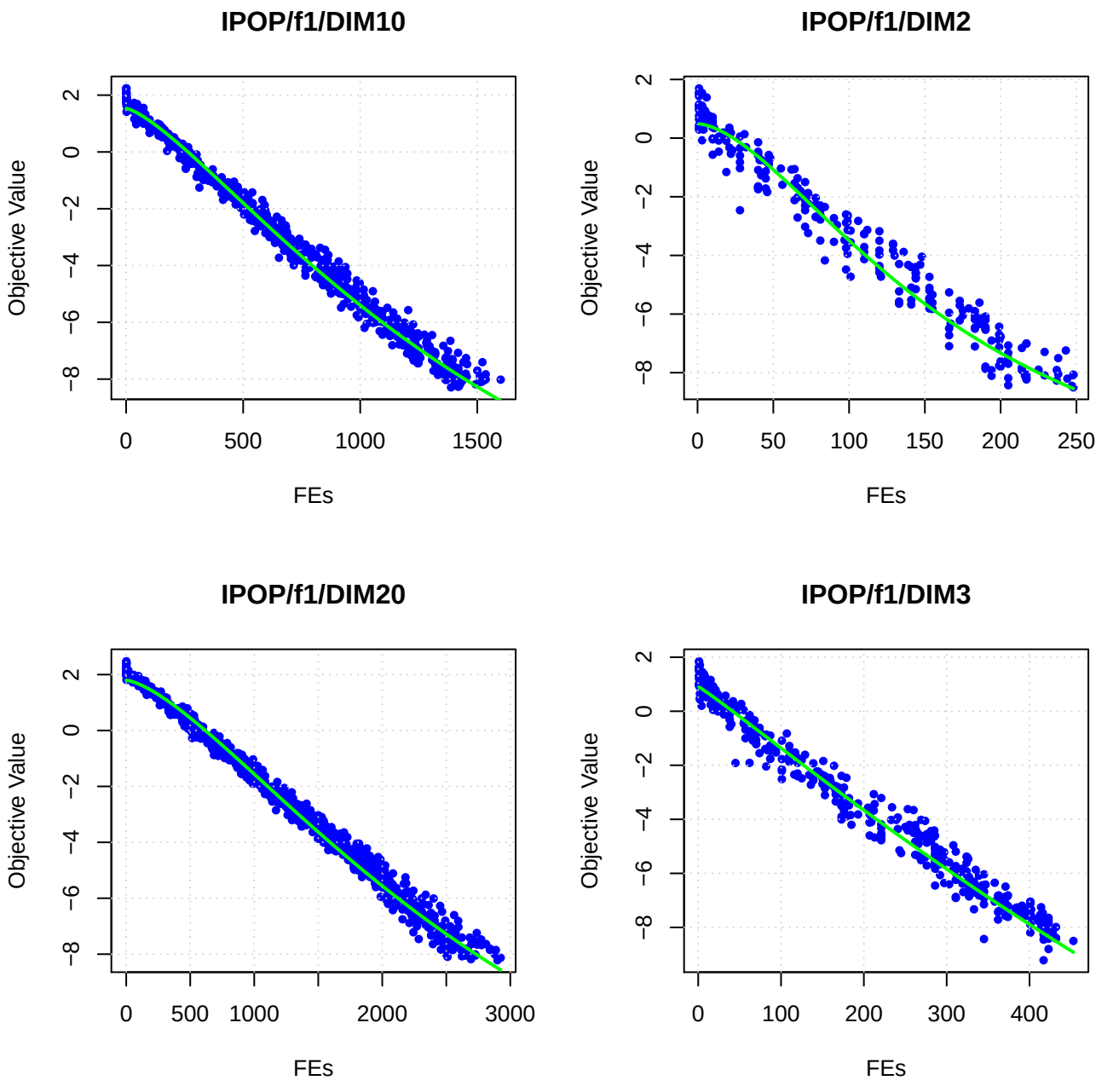
Objective Value
FEs
IPOP−texp/f9/DIM3
Objective Value
FEs
IPOP−texp/f9/DIM40
Objective Value
FEs
IPOP−texp/f9/DIM5
Objective Value
FEs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Objective Value
FEs
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−4
−6
−8
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500
1000
1500
IPOP/f1/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
150
200
250
IPOP/f1/DIM20
Objective Value
FEs
2
0
−2
−4
−6
−8
0
500
1000
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IPOP/f1/DIM3
Objective Value
FEs
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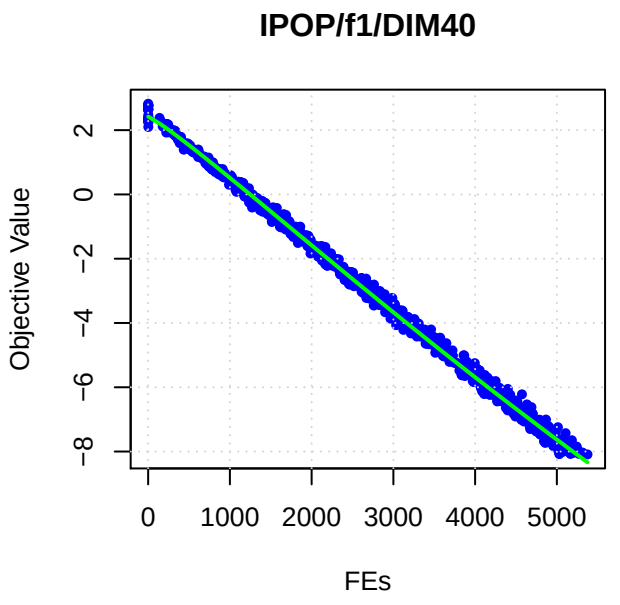
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Objective Value
FEs
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4000
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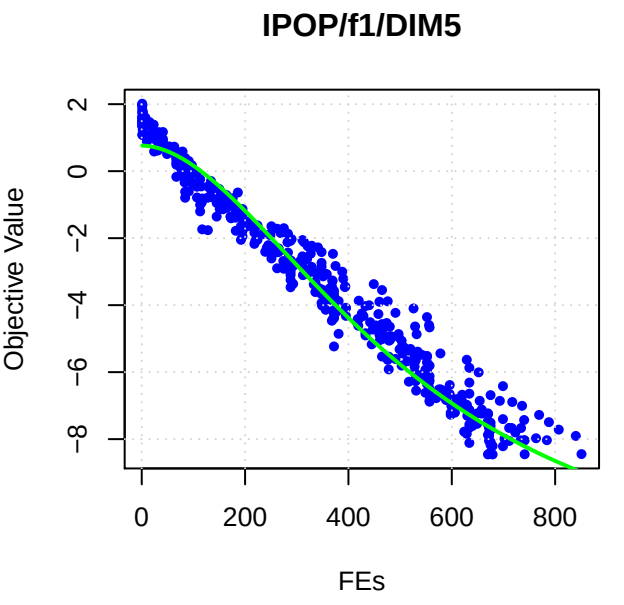
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Objective Value
FEs
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600
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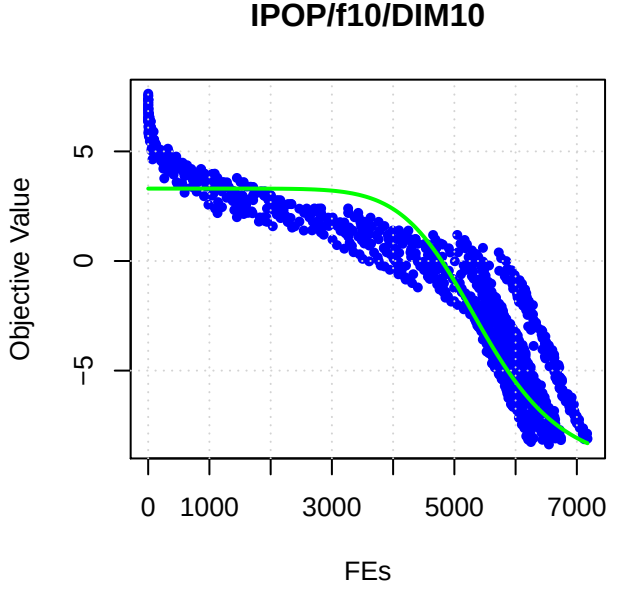
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Objective Value
FEs
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5000
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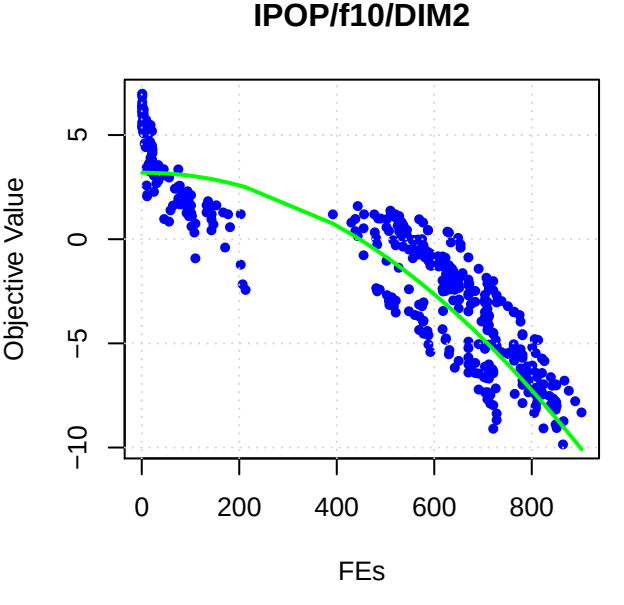
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Objective Value
FEs
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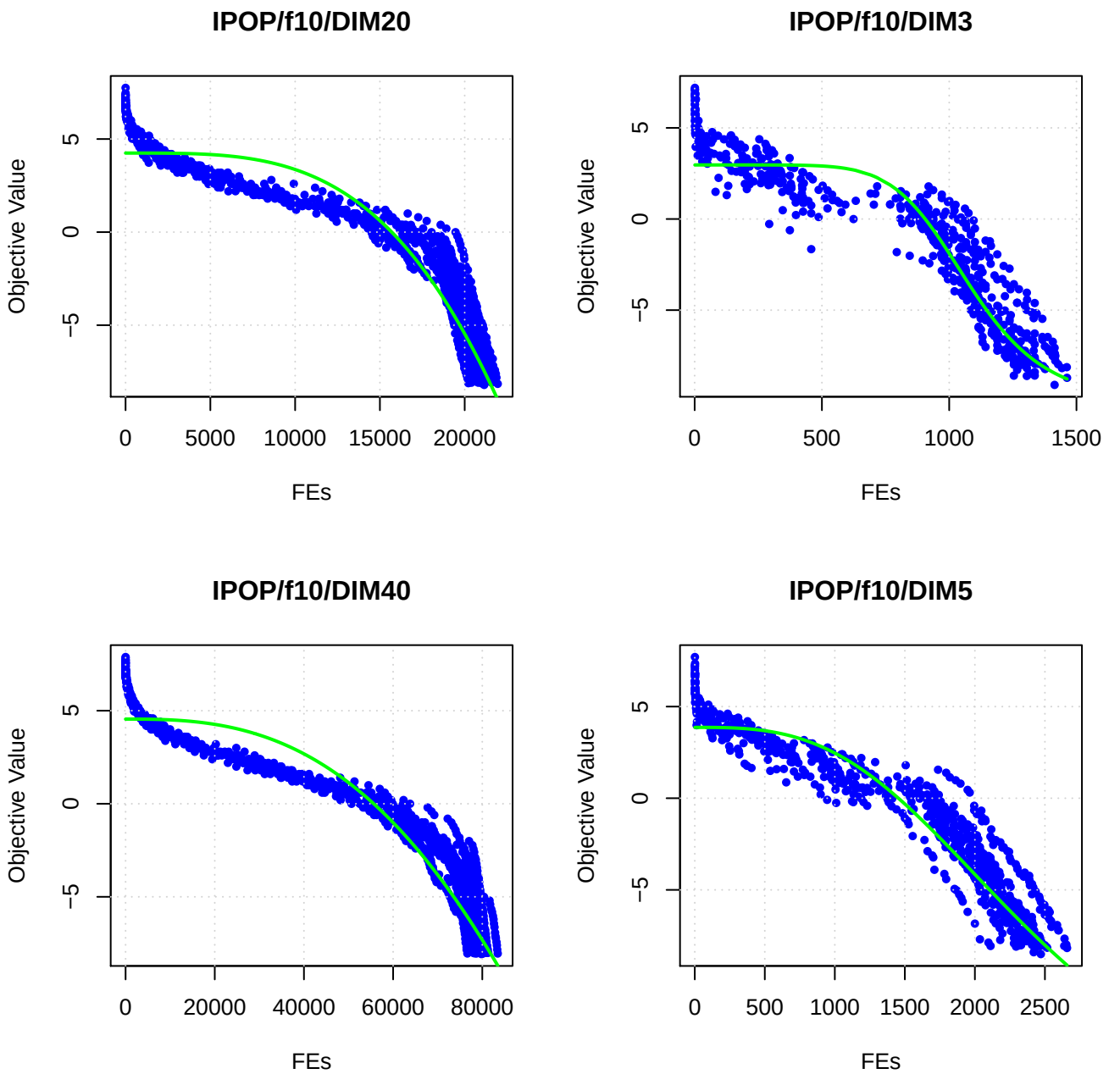
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FEs
IPOP/f10/DIM3
Objective Value
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0
500
1000
1500
FEs
IPOP/f10/DIM40
Objective Value
5
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20000
40000
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IPOP/f10/DIM5
Objective Value
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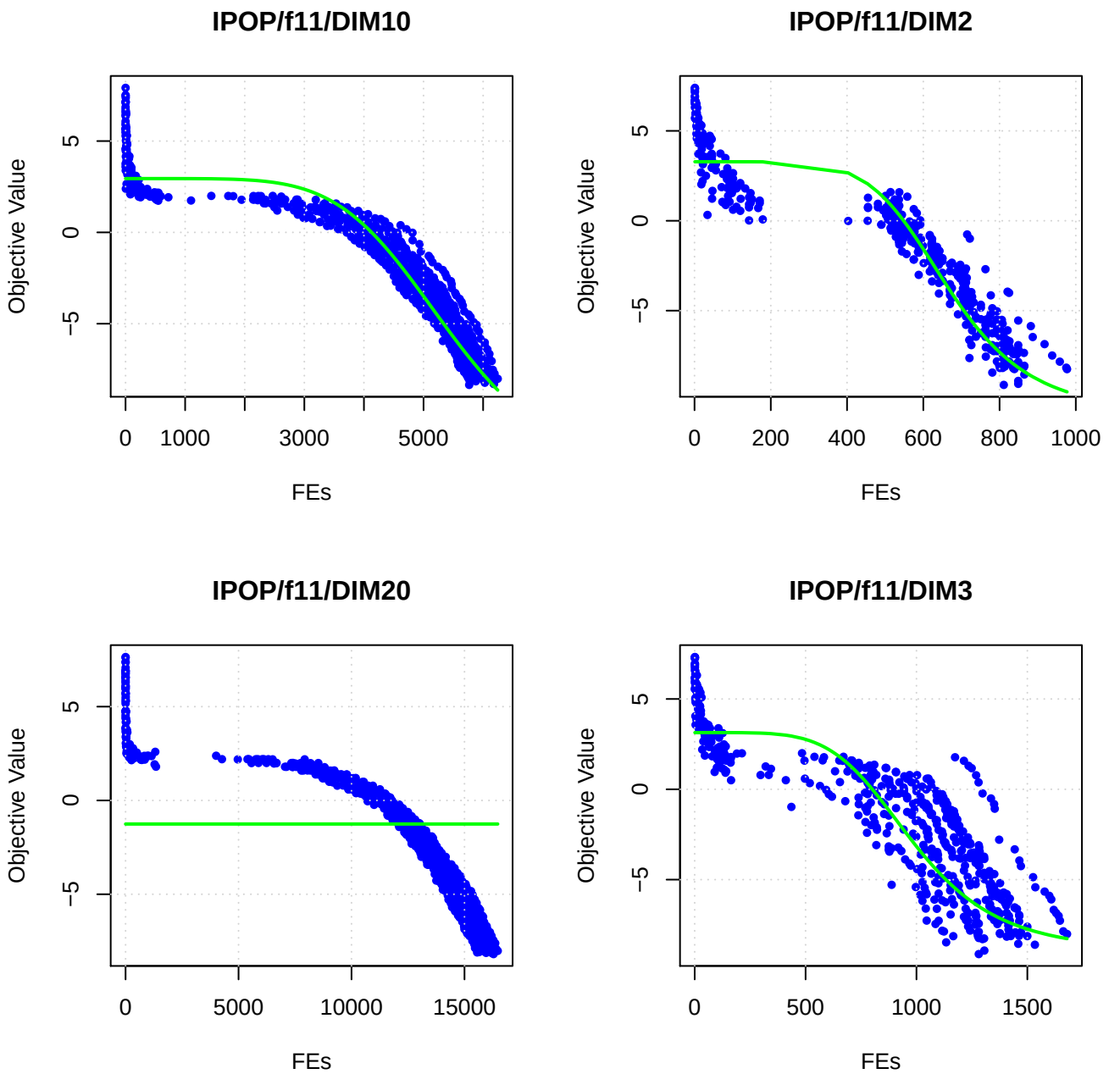
1500
2000
2500
FEs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FEs
IPOP/f11/DIM2
Objective Value
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400
600
800
1000
FEs
IPOP/f11/DIM20
Objective Value
5
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15000
FEs
IPOP/f11/DIM3
Objective Value
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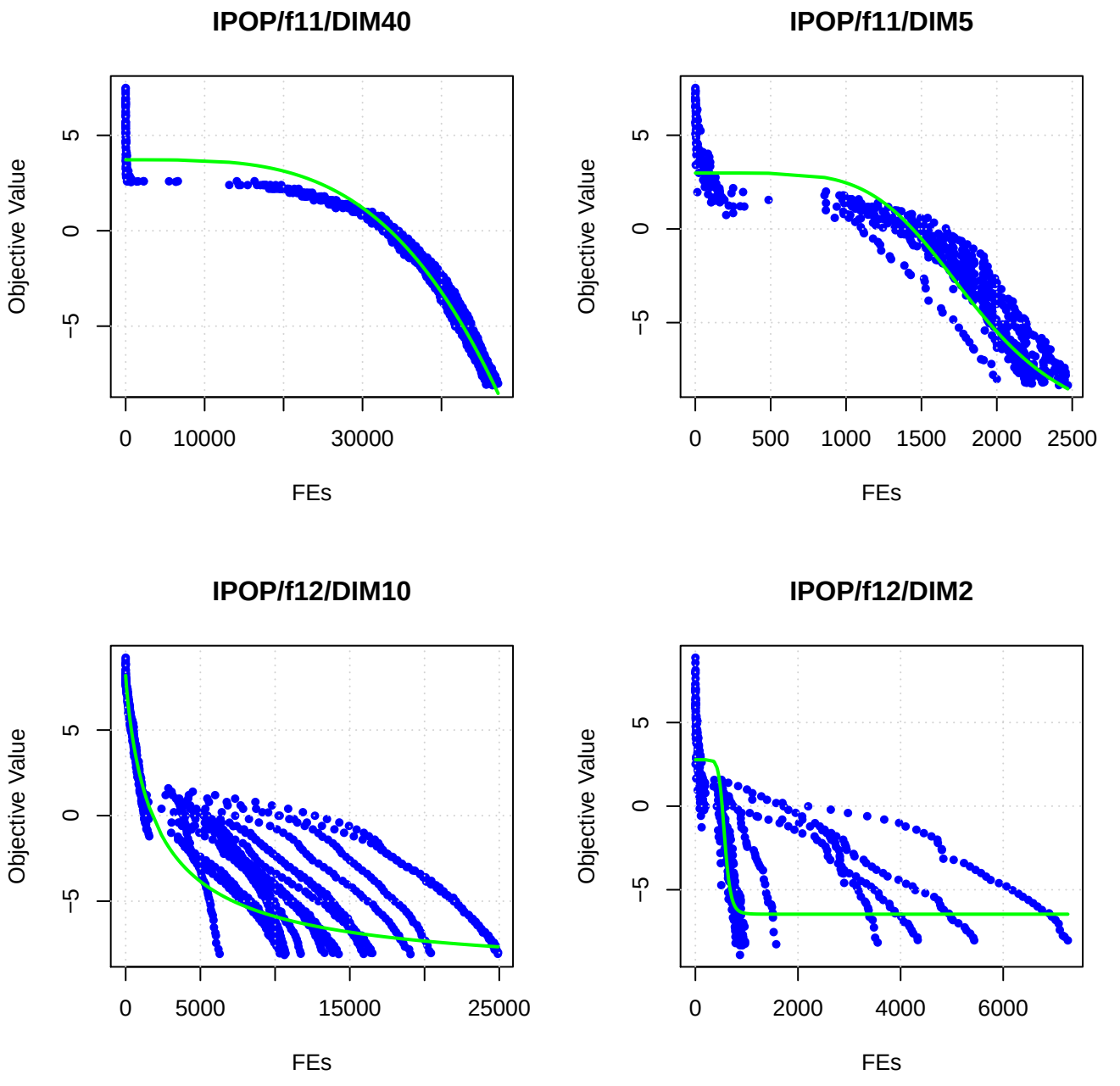
500
1000
1500
FEs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10000
30000
FEs
IPOP/f11/DIM5
Objective Value
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0
500
1000
1500
2000
2500
FEs
IPOP/f12/DIM10
Objective Value
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0
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25000
FEs
IPOP/f12/DIM2
Objective Value
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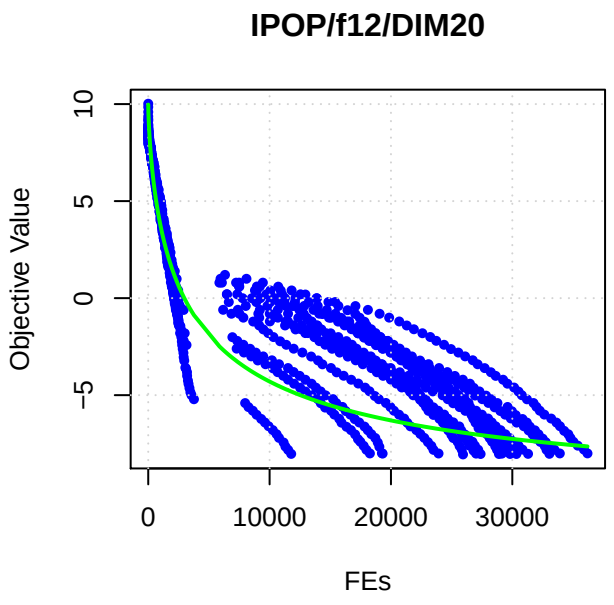
4000
6000
FEs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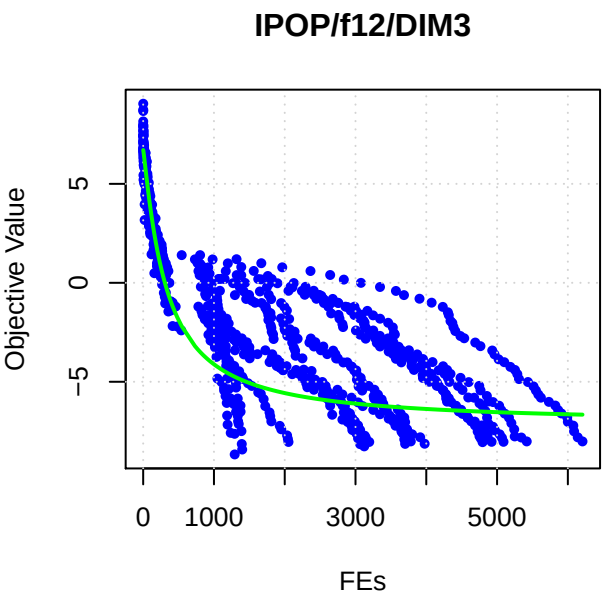
20000
30000
FEs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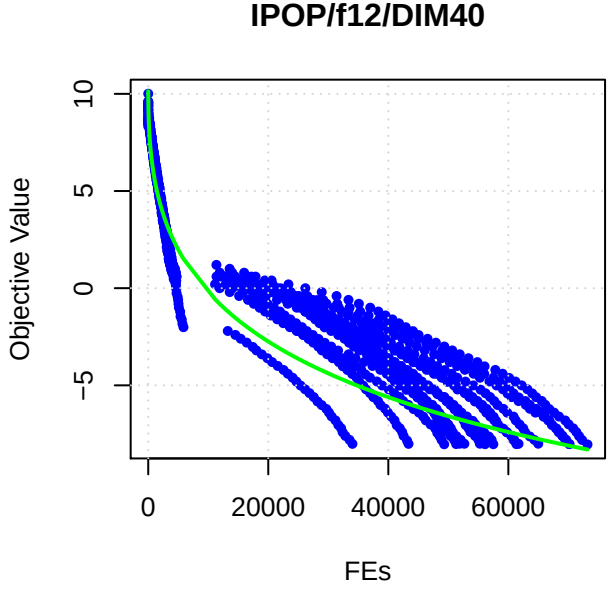
3000
5000
FEs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40000
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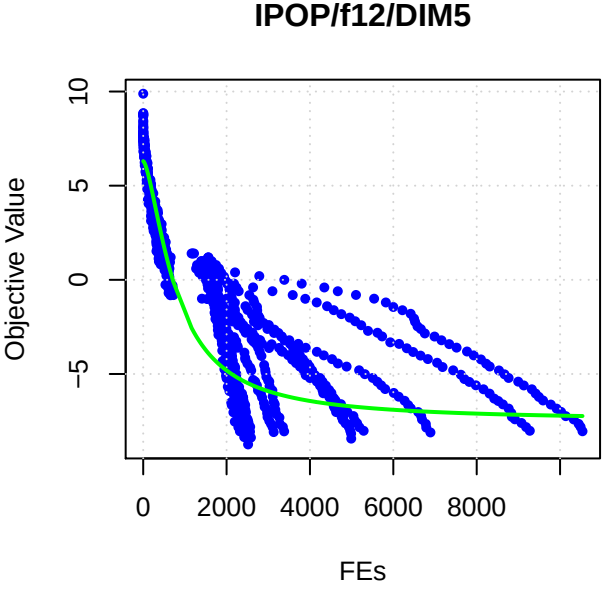
FEs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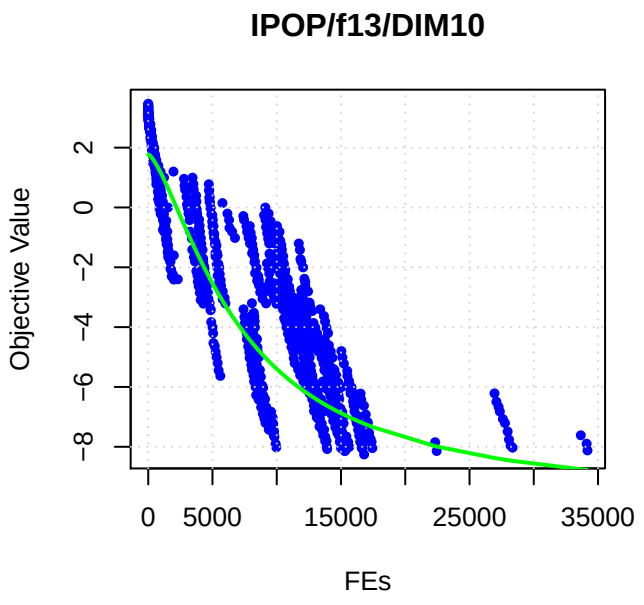
6000
8000
FEs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Objective Value
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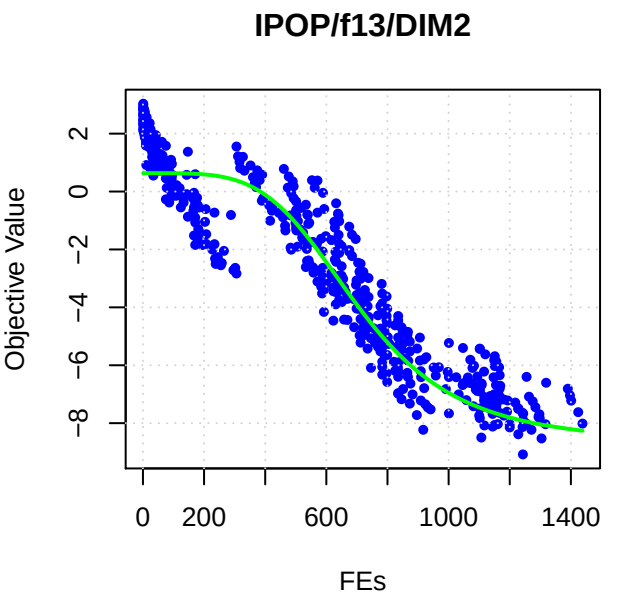
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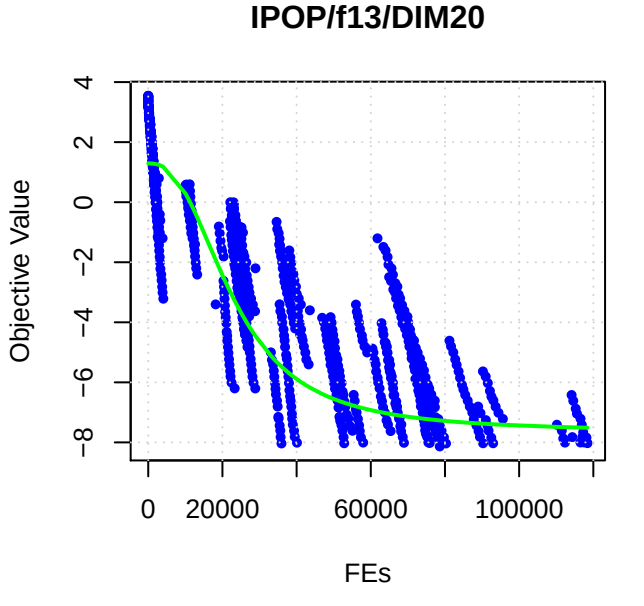
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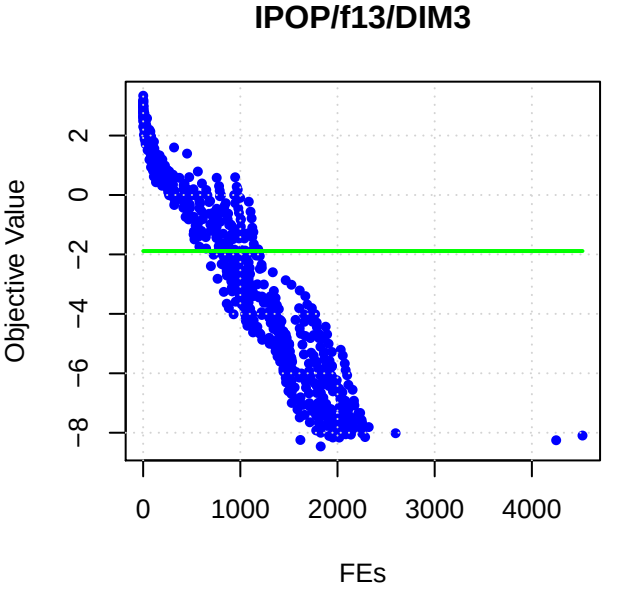
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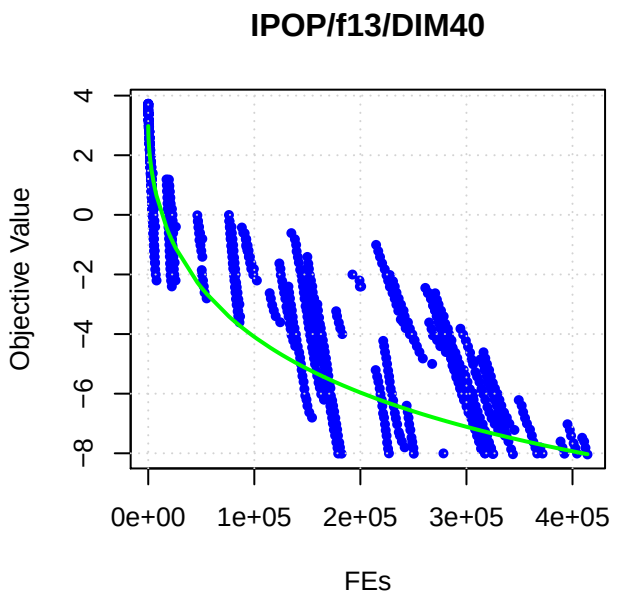
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Objective Value
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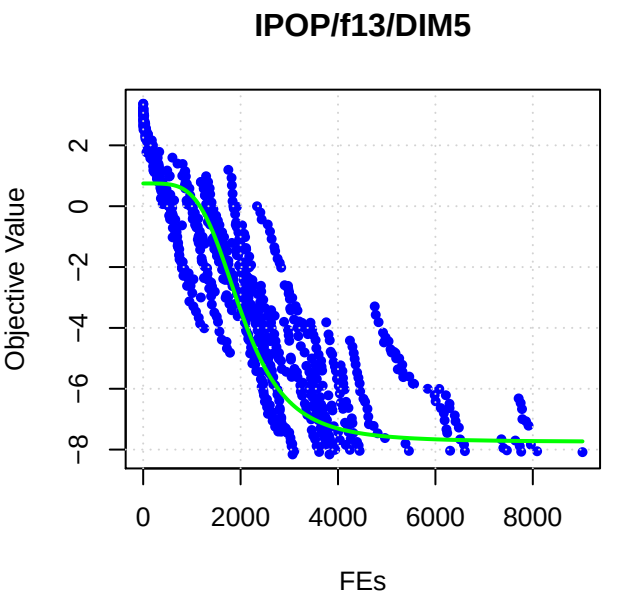
4e+05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6000
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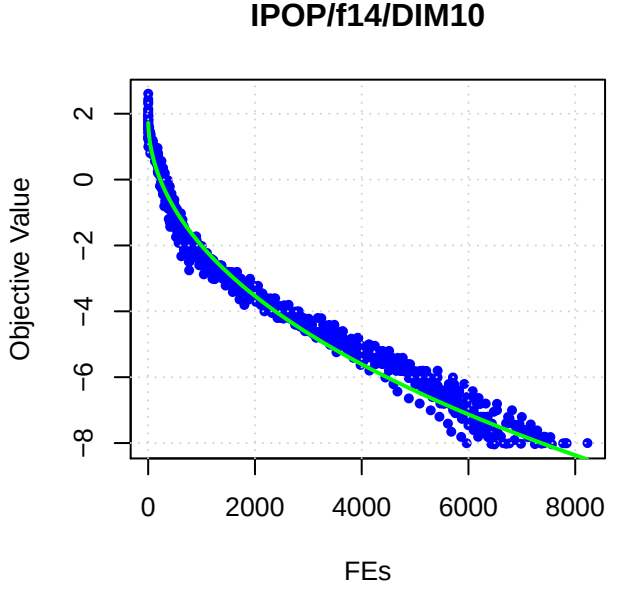
IPOP/f14/DIM10
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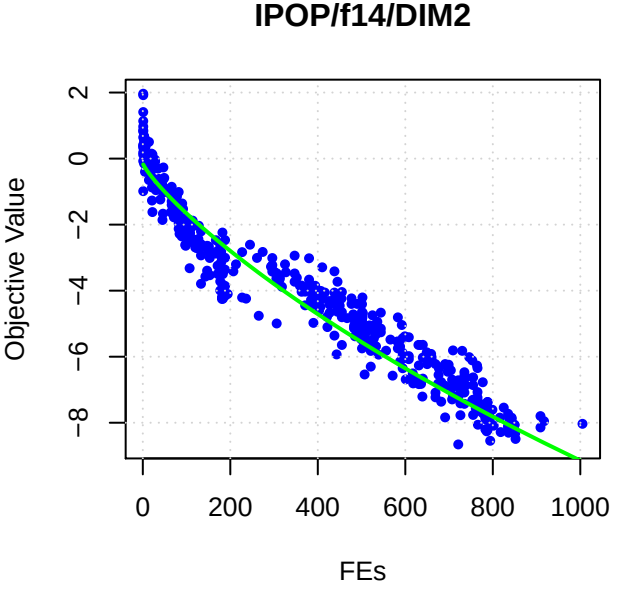
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Objective Value
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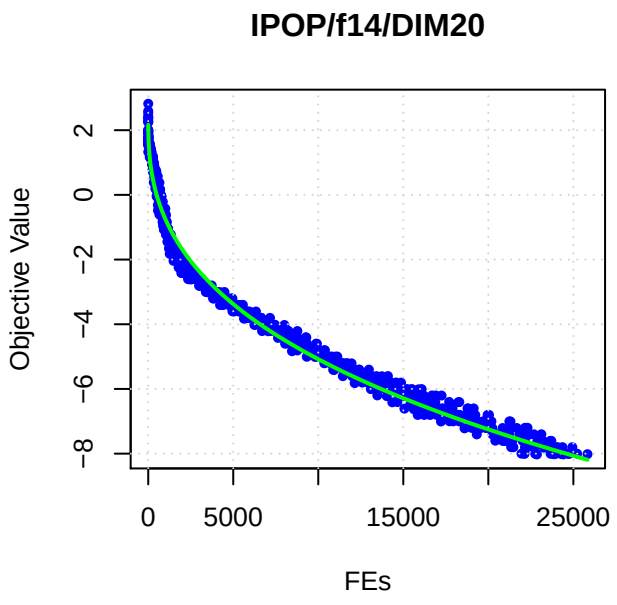
IPOP/f14/DIM20
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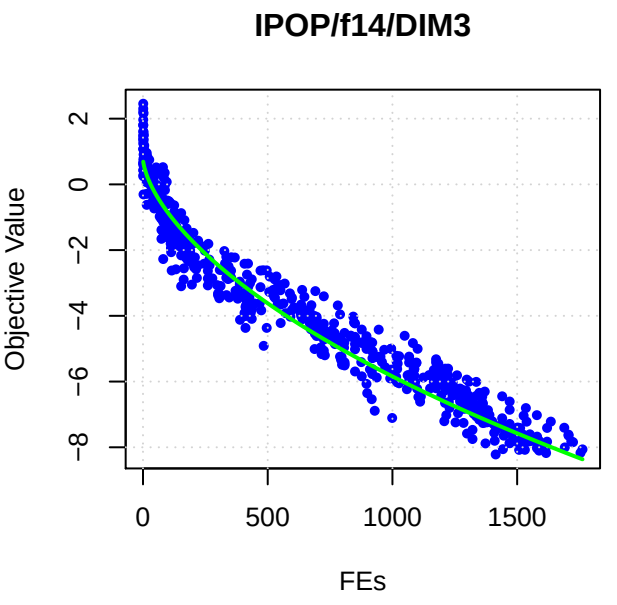
IPOP/f14/DIM3
Objective Value
FEs
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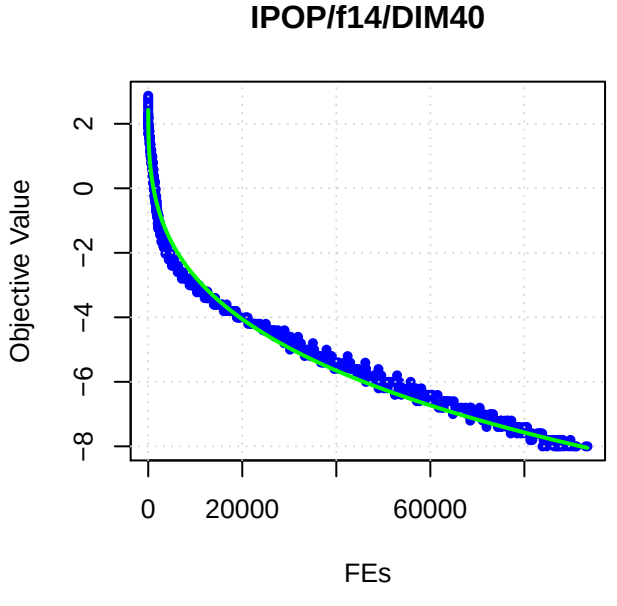
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Objective Value
FEs
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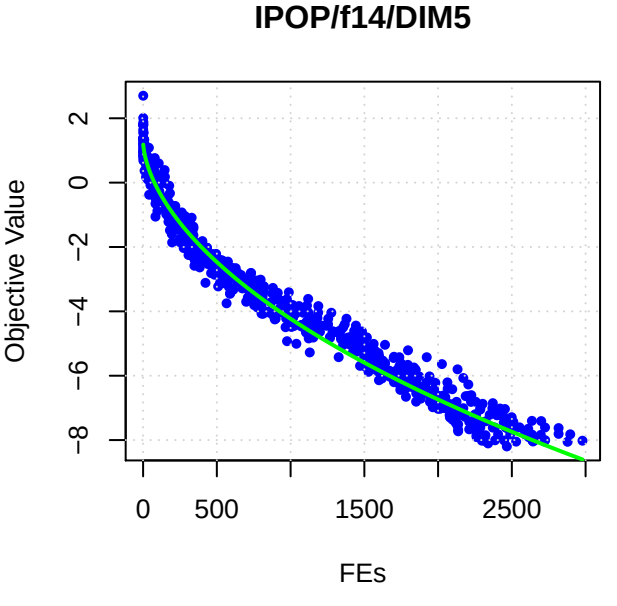
60000


IPOP/f14/DIM5
Objective Value
FEs
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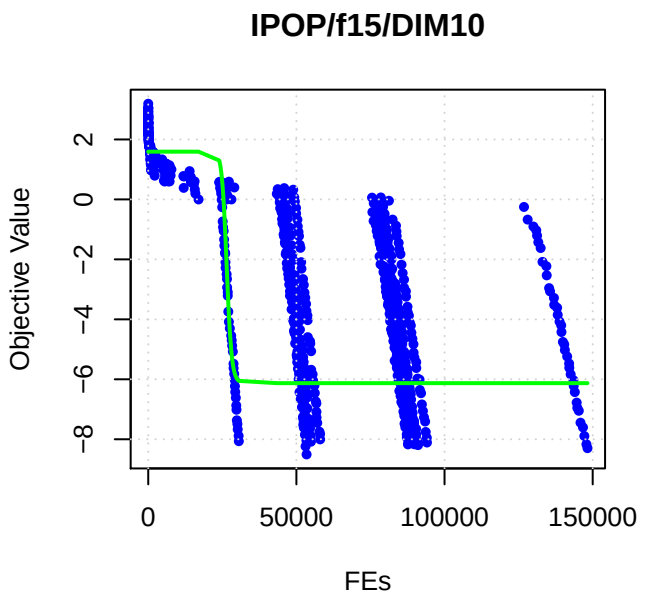
1500
2500


IPOP/f15/DIM10
Objective Value
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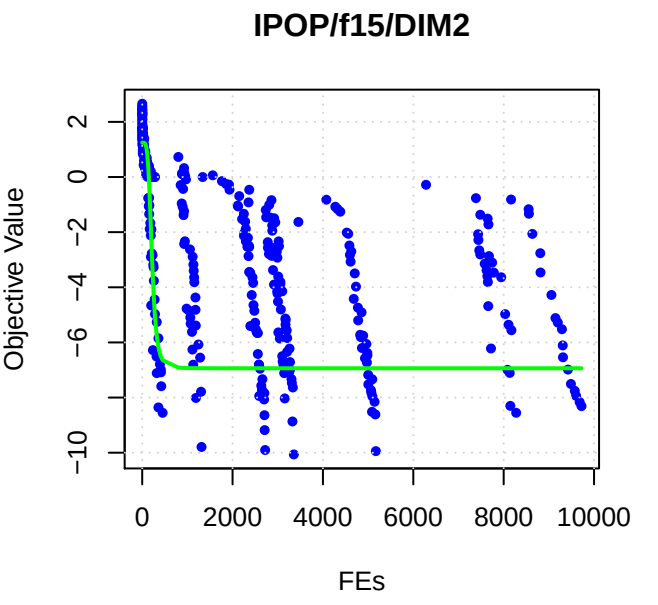
100000
150000


IPOP/f15/DIM2
Objective Value
FEs
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−4
−6
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4000
6000
8000
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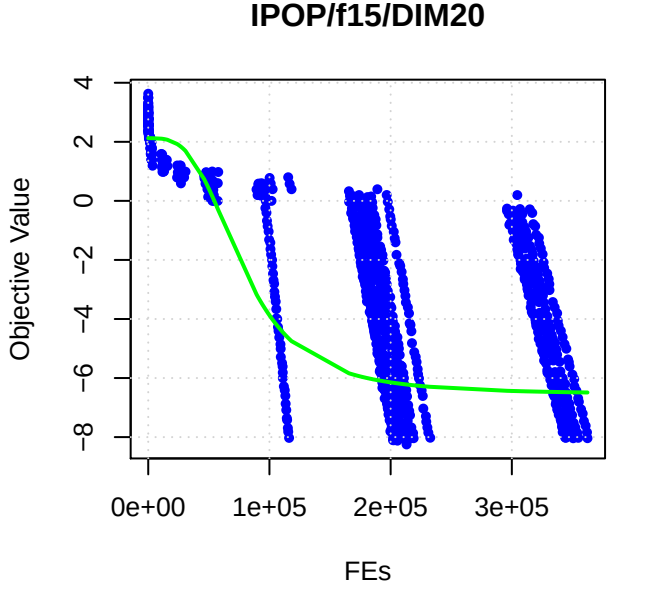
IPOP/f15/DIM20
Objective Value
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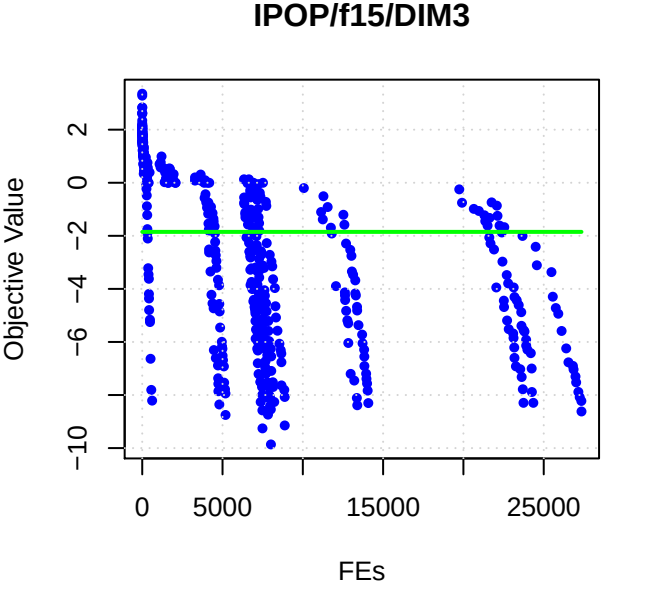
2e+05
3e+05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Objective Value
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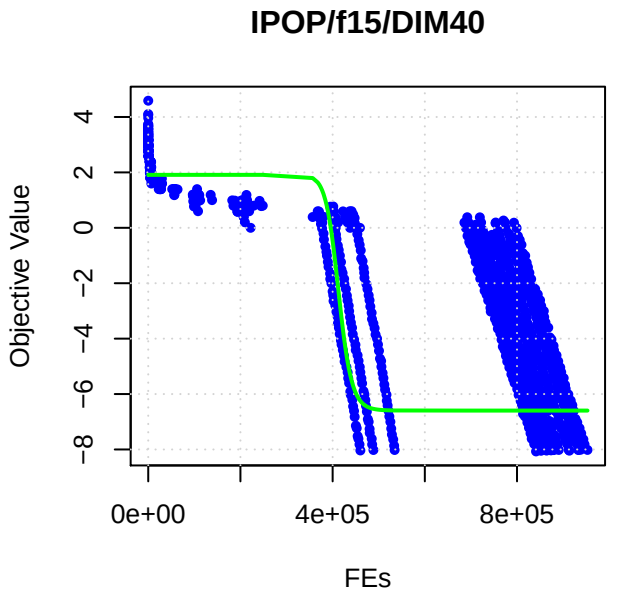
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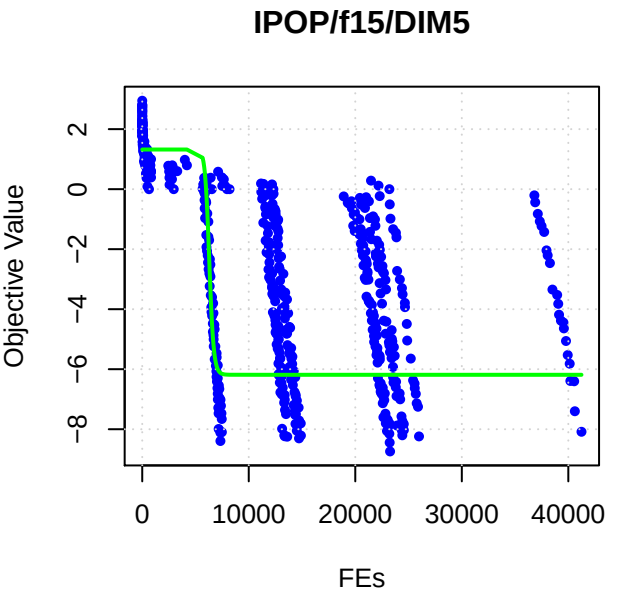
FEs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−8
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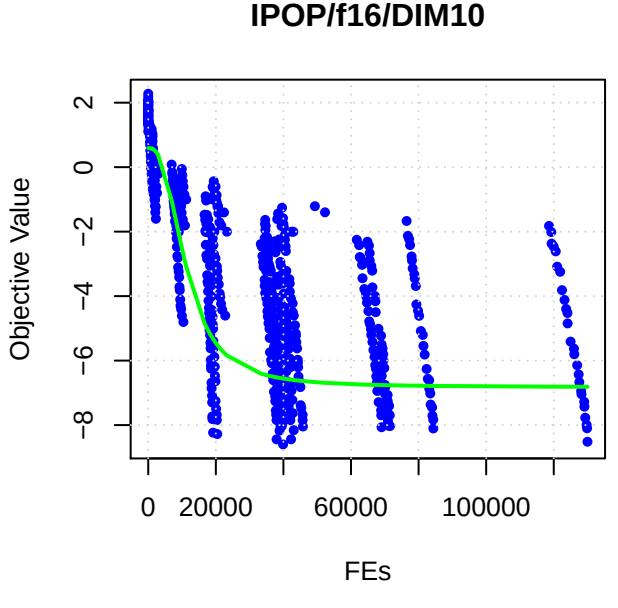
30000
40000
FEs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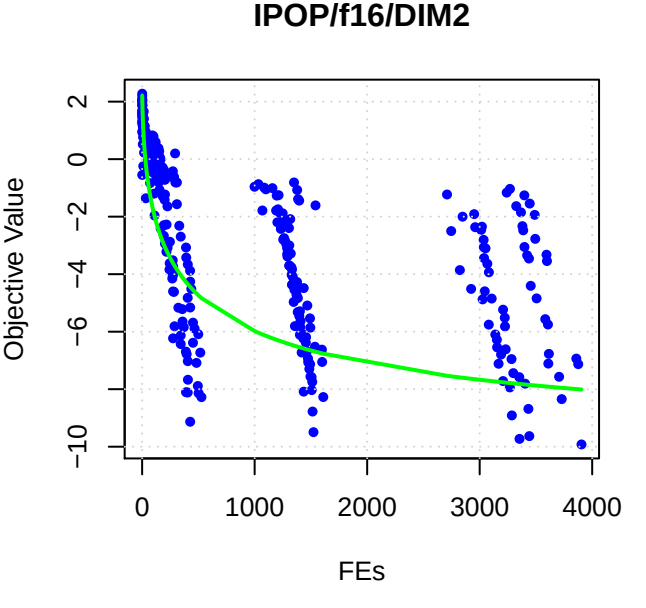
60000
100000
FEs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3000
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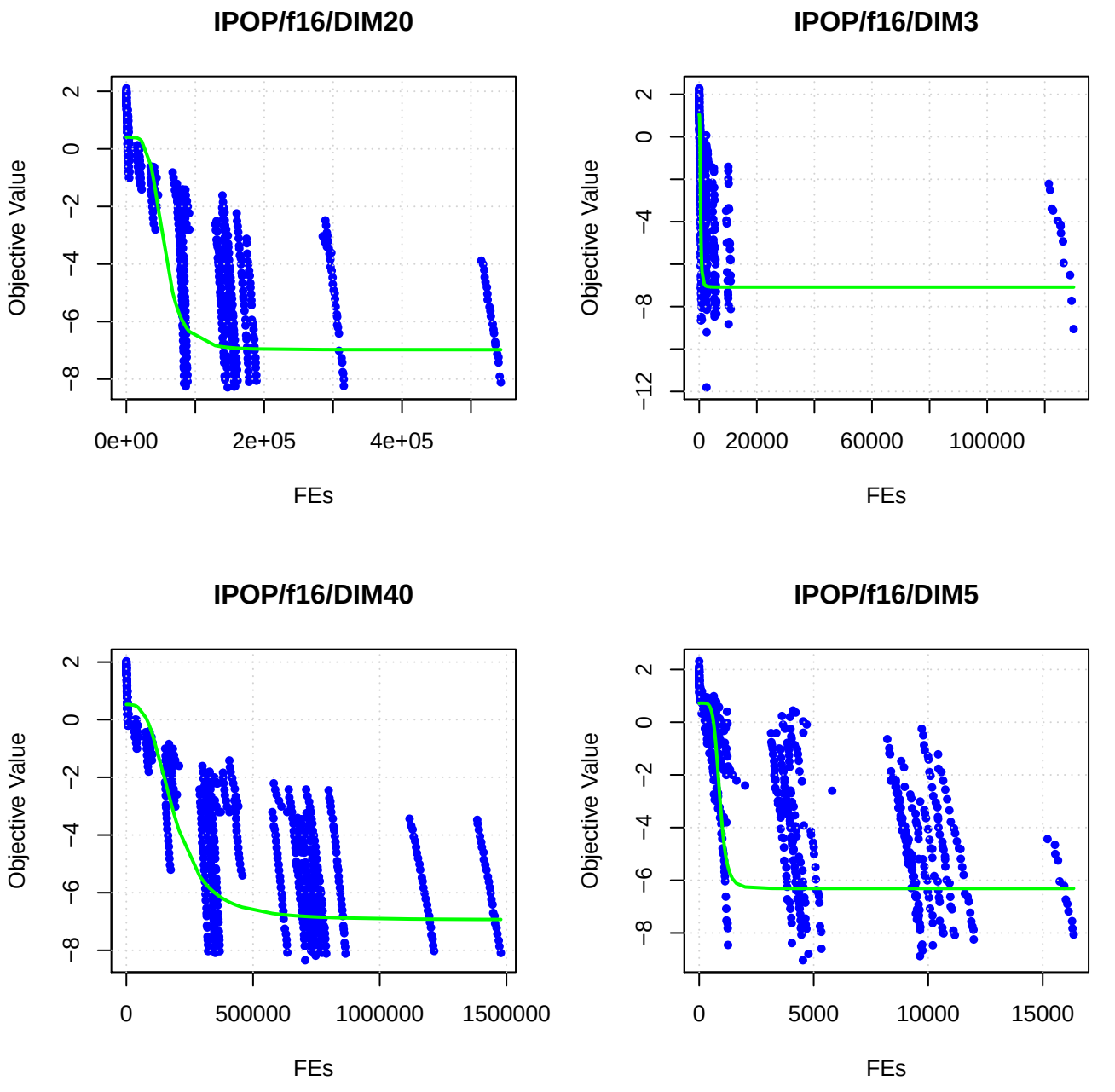
FEs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−2
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−8
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2e+05
4e+05
FEs
IPOP/f16/DIM3
Objective Value
2
0
−4
−8
−12
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20000
60000
100000
FEs
IPOP/f16/DIM40
Objective Value
2
0
−2
−4
−6
−8
0
500000
1000000
1500000
FEs
IPOP/f16/DIM5
Objective Value
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−2
−4
−6
−8
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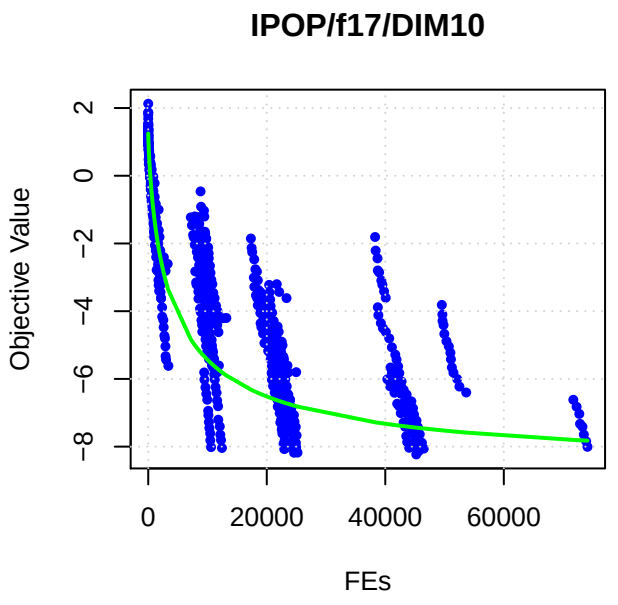
10000
15000
FEs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Objective Value
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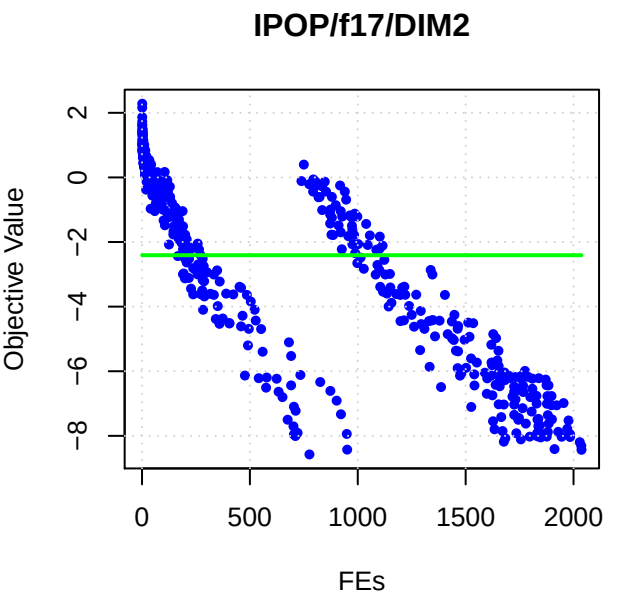
60000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Objective Value
FEs
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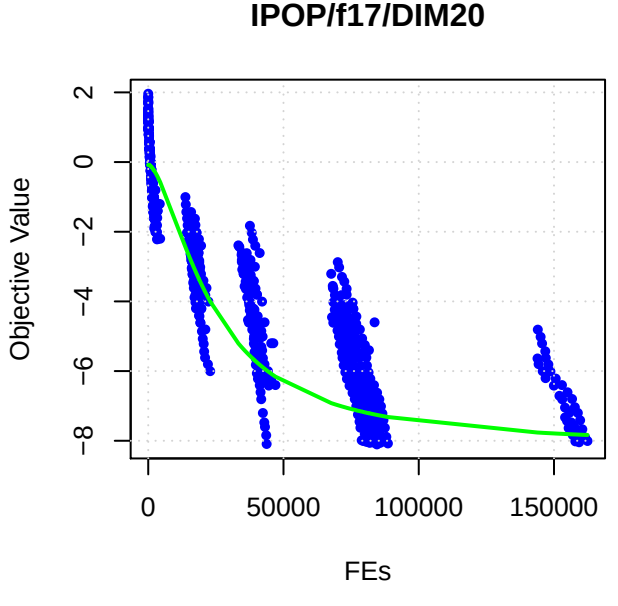
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Objective Value
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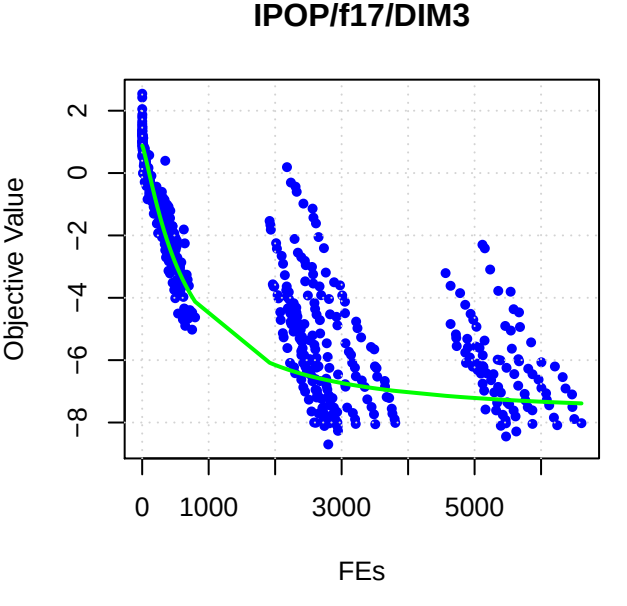
IPOP/f17/DIM3
Objective Value
FEs
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−4
−6
−8
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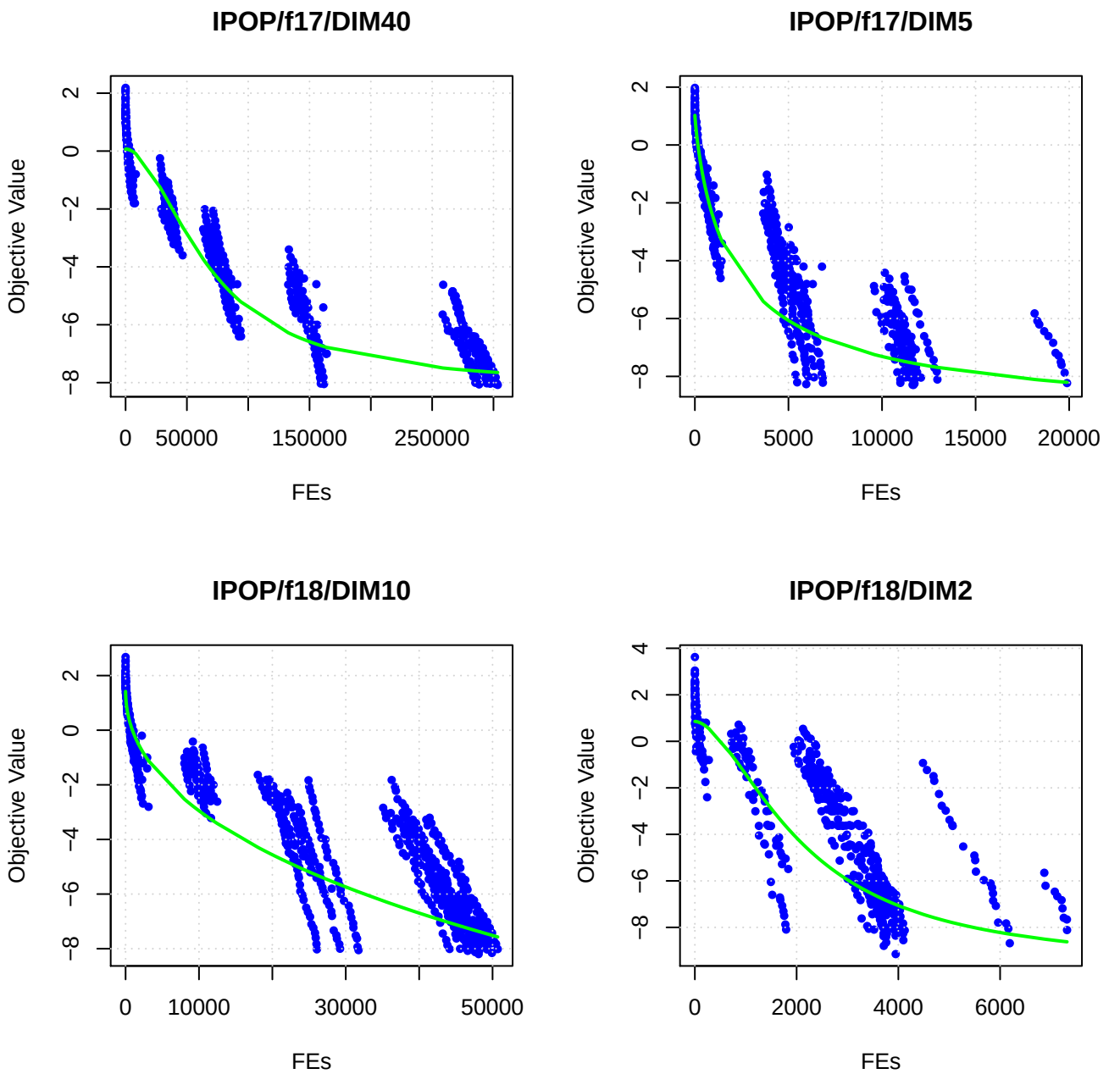
3000
5000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Objective Value
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150000
250000
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−2
−4
−6
−8
IPOP/f17/DIM5
Objective Value
FEs
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5000
10000
15000
20000
2
0
−2
−4
−6
−8
IPOP/f18/DIM10
Objective Value
FEs
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10000
30000
50000
2
0
−2
−4
−6
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IPOP/f18/DIM2
Objective Value
FEs
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4000
6000
4
2
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−4
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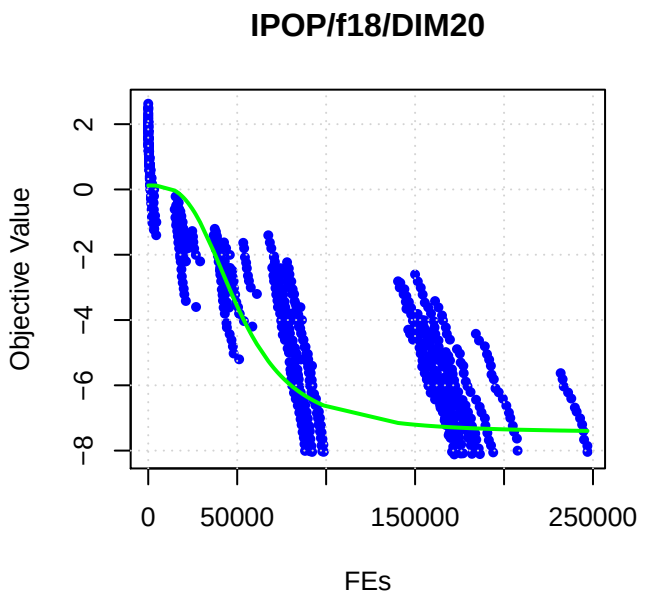
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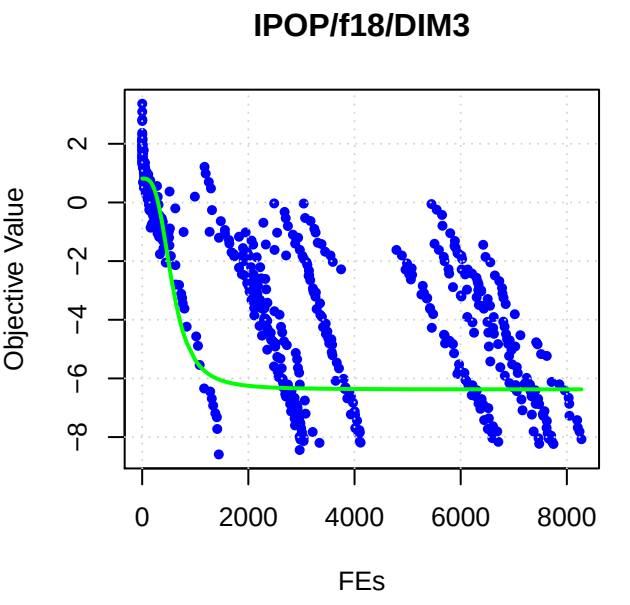
FEs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Objective Value
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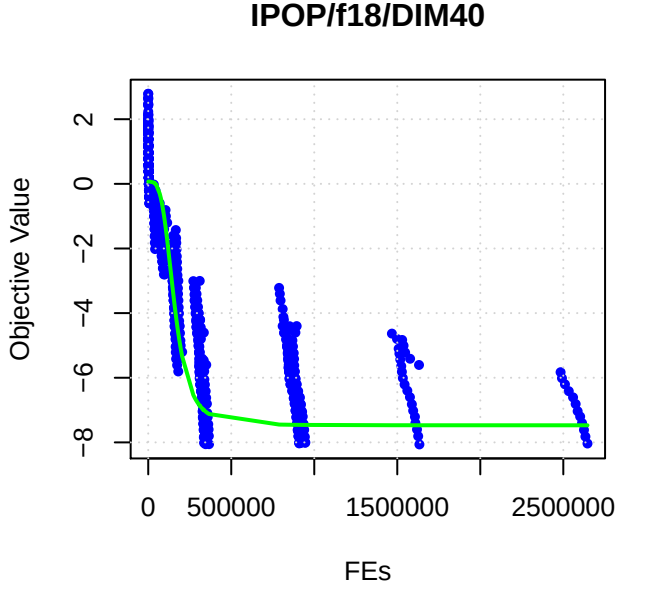
8000
FEs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Objective Value
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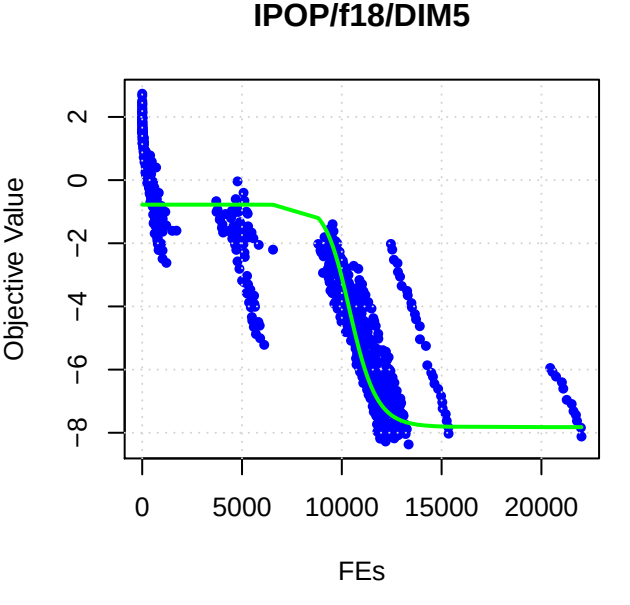
FEs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Objective Value
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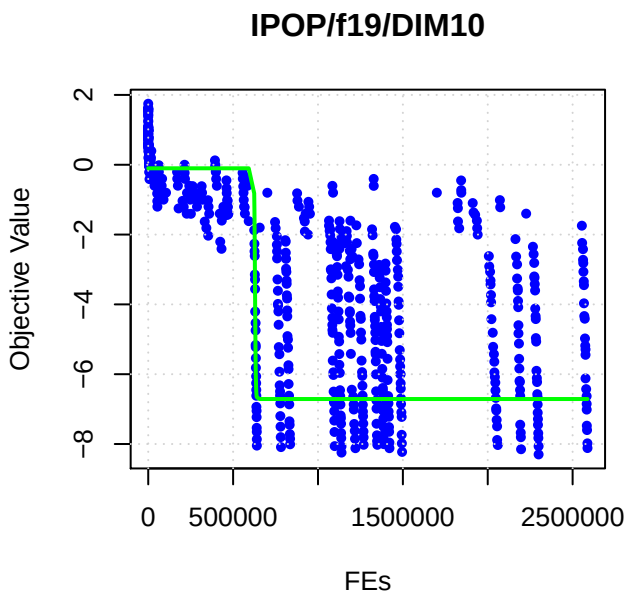
FEs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Objective Value
FEs
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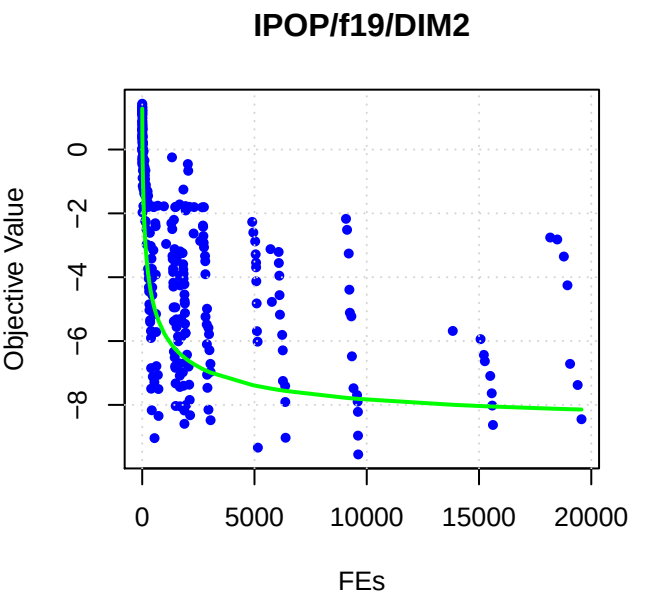
2500000


IPOP/f19/DIM2
Objective Value
FEs
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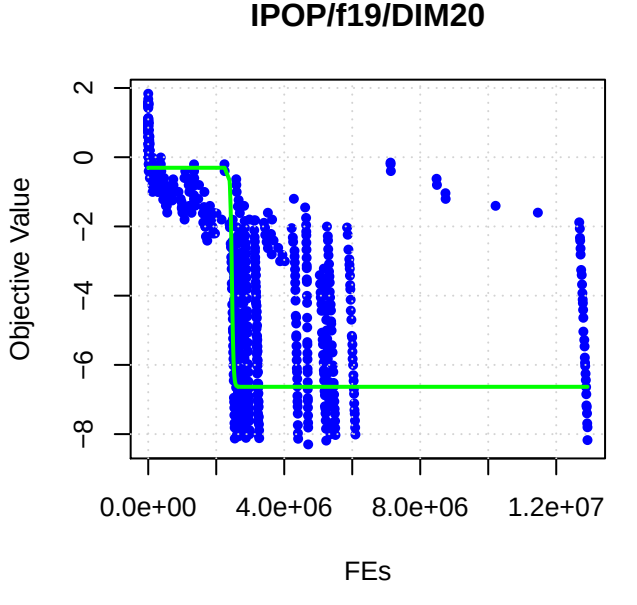
10000
15000
20000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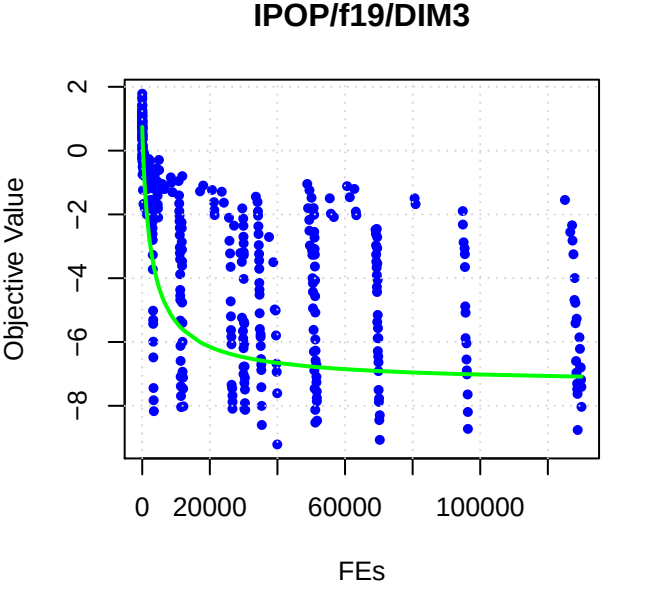
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Objective Value
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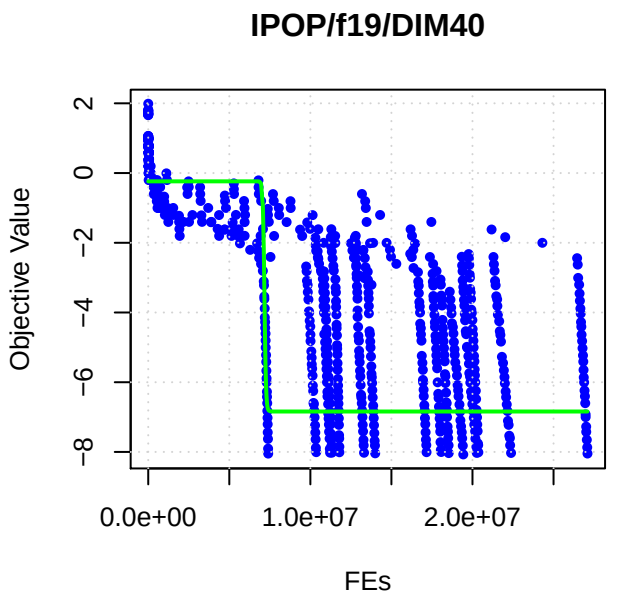
IPOP/f19/DIM40
Objective Value
FEs
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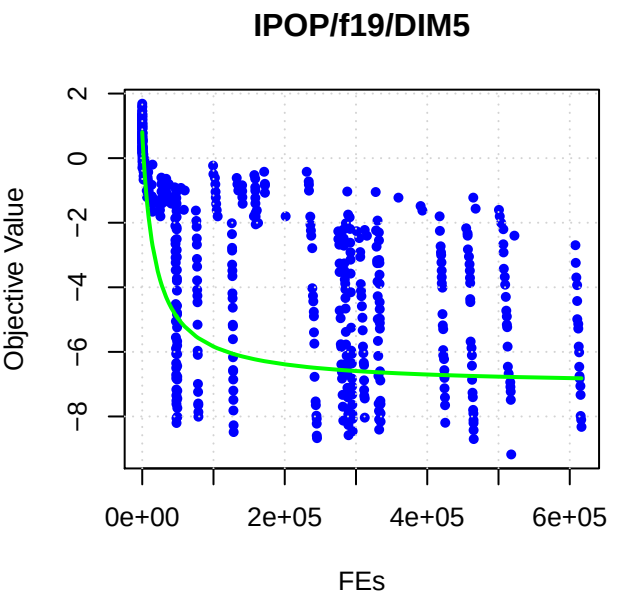
2.0e+07


IPOP/f19/DIM5
Objective Value
FEs
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4e+05
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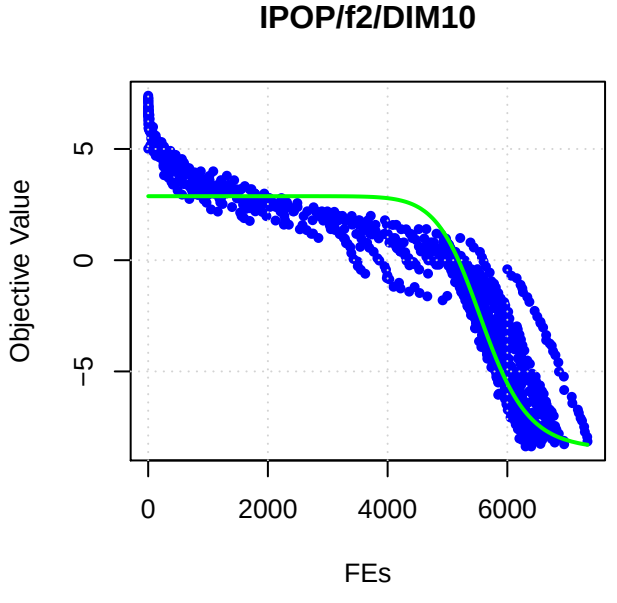
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Objective Value
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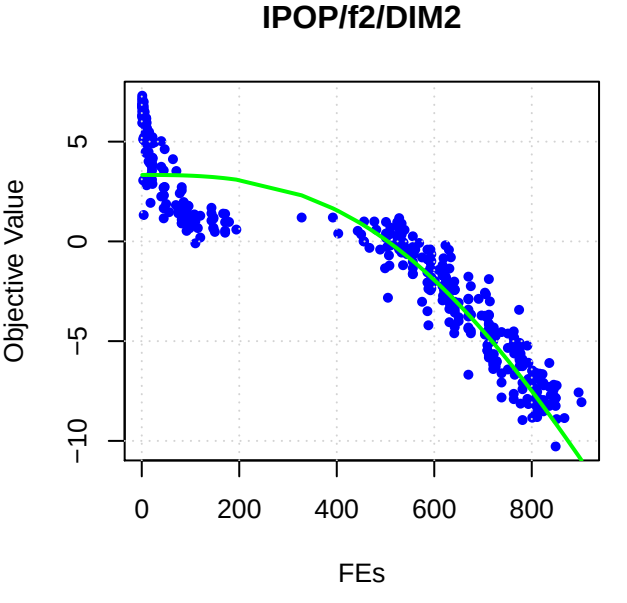
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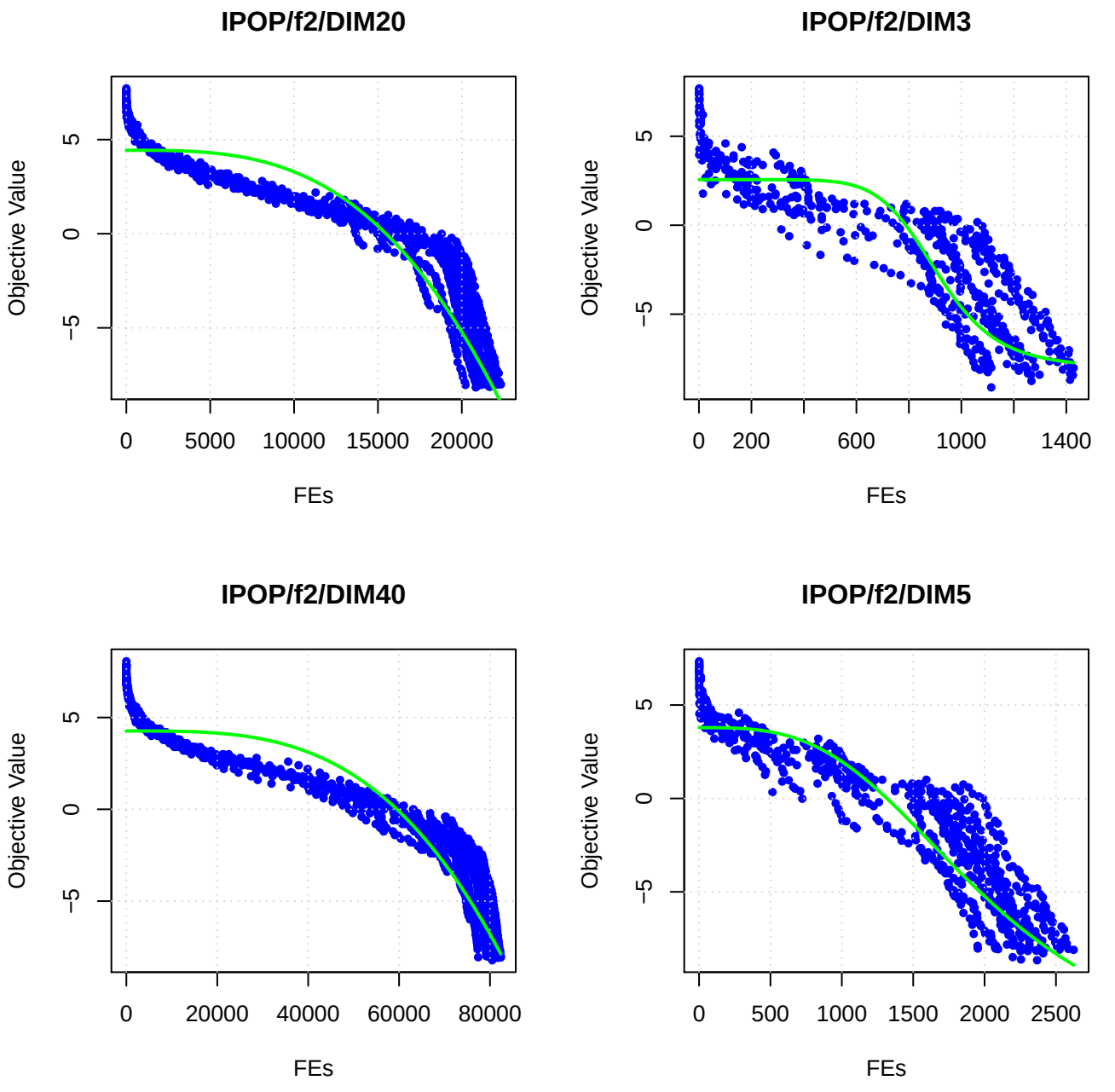
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IPOP/f2/DIM3
Objective Value
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200
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1000
1400
FEs
IPOP/f2/DIM40
Objective Value
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40000
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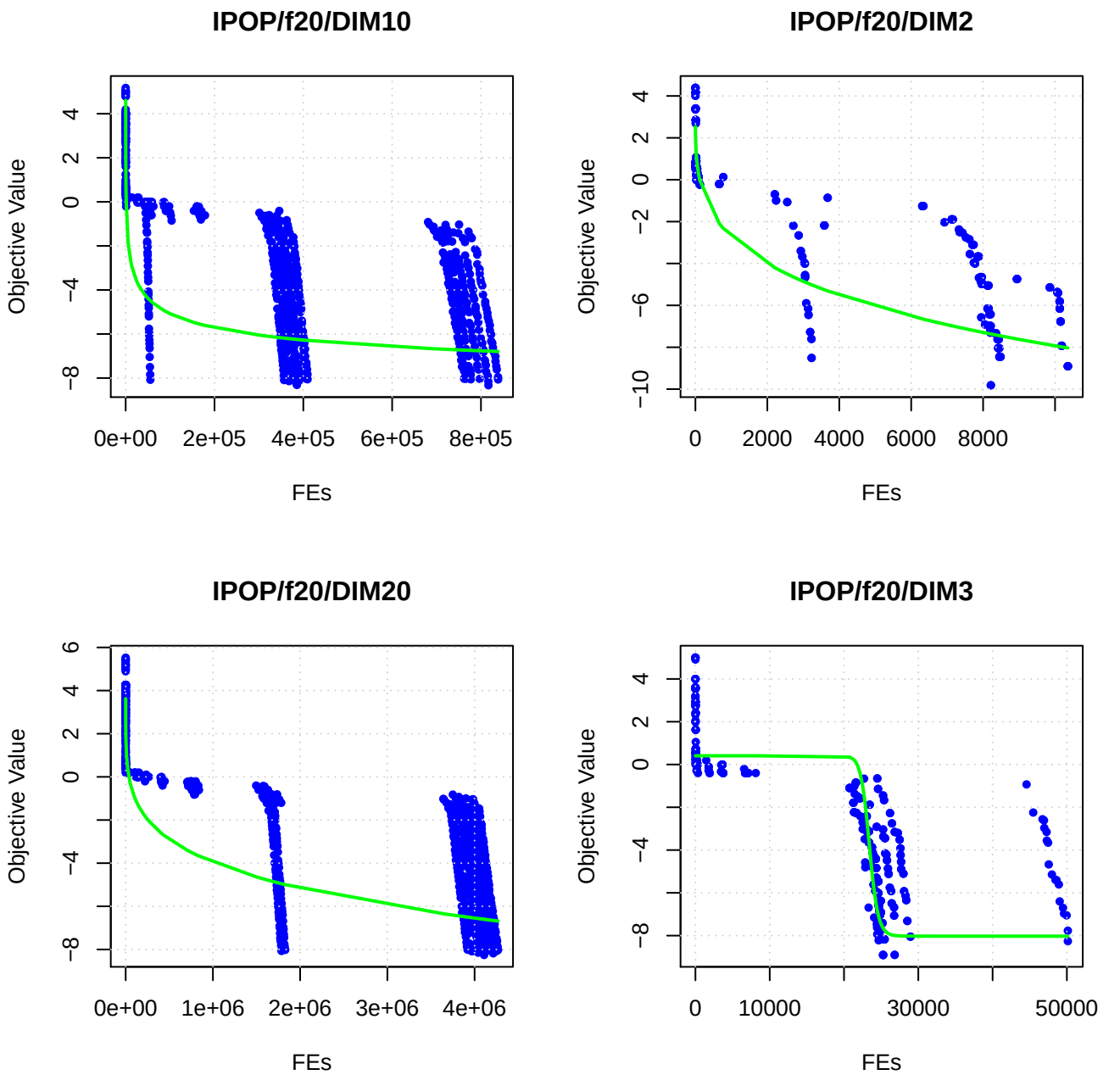
FEs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Objective Value
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4e+05
6e+05
8e+05
FEs
IPOP/f20/DIM2
Objective Value
4
2
0
−2
−6
−10
0
2000
4000
6000
8000
FEs
IPOP/f20/DIM20
Objective Value
6
4
2
0
−4
−8
0e+00
1e+06
2e+06
3e+06
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FEs
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Objective Value
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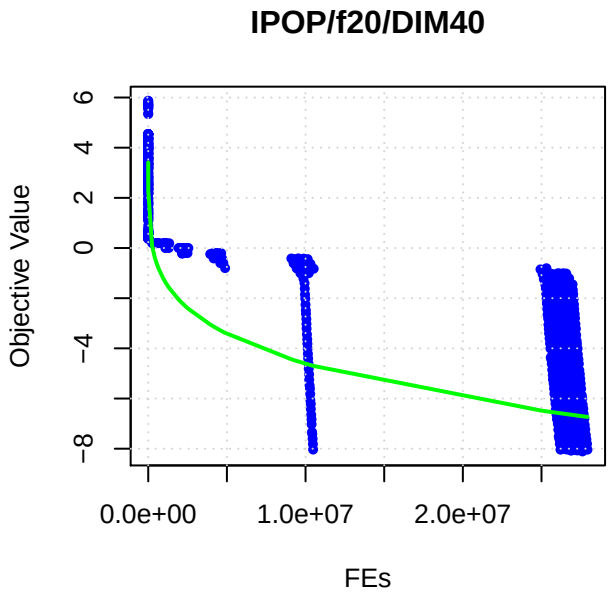
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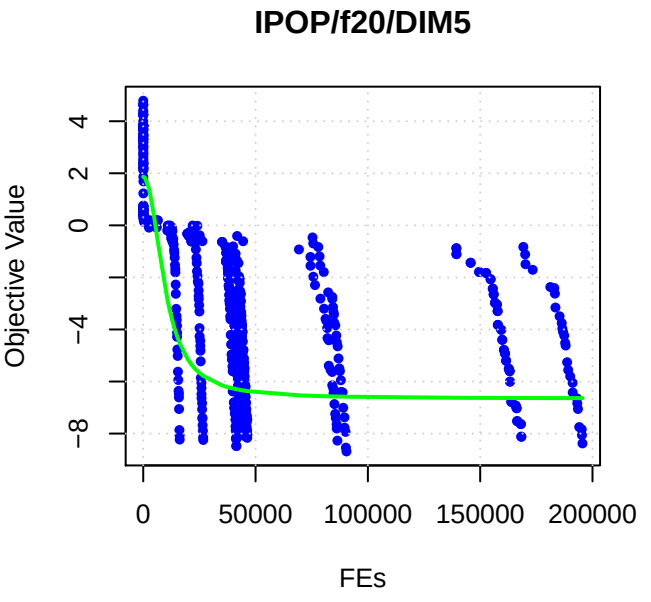
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Objective Value
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150000
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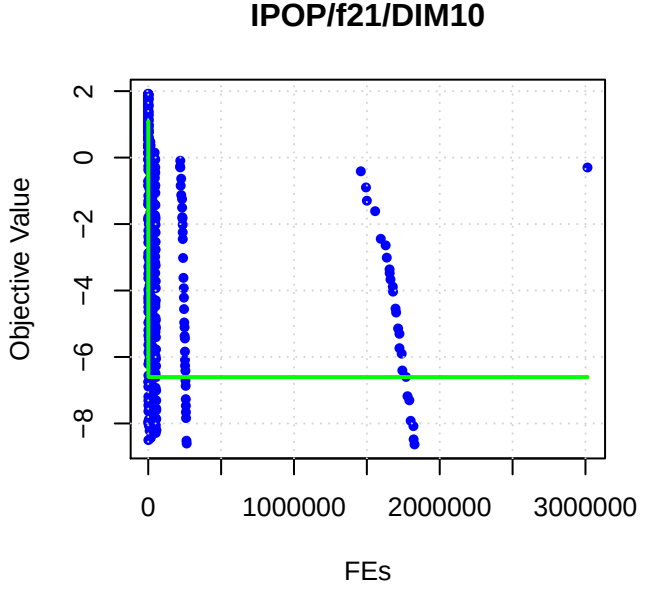
FEs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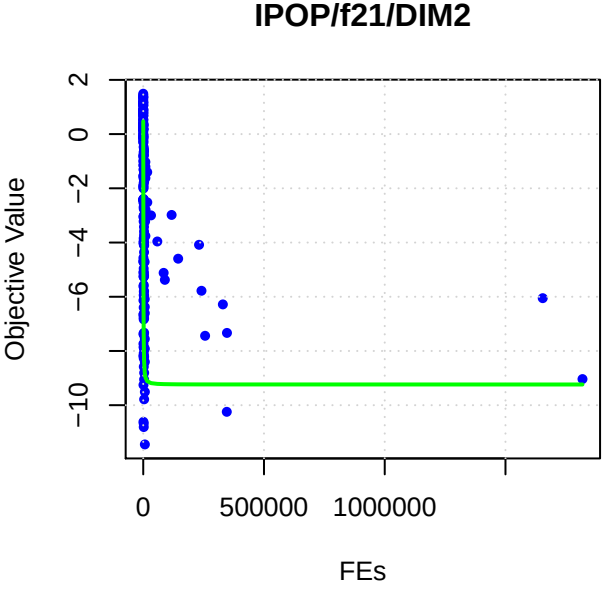
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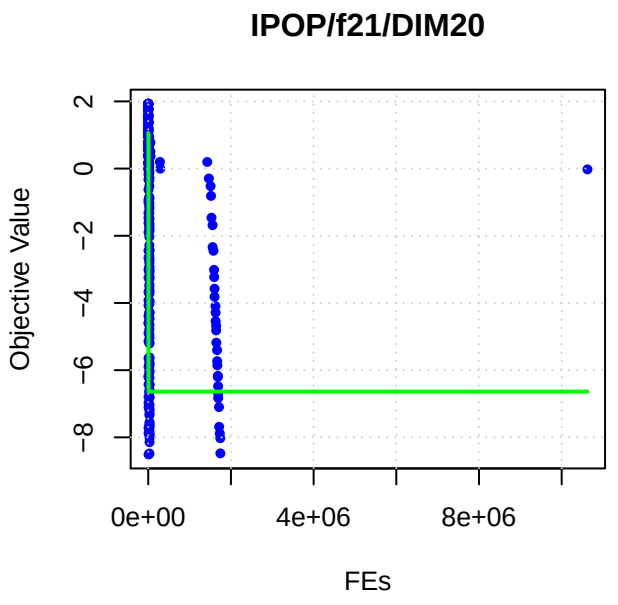
FEs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Objective Value
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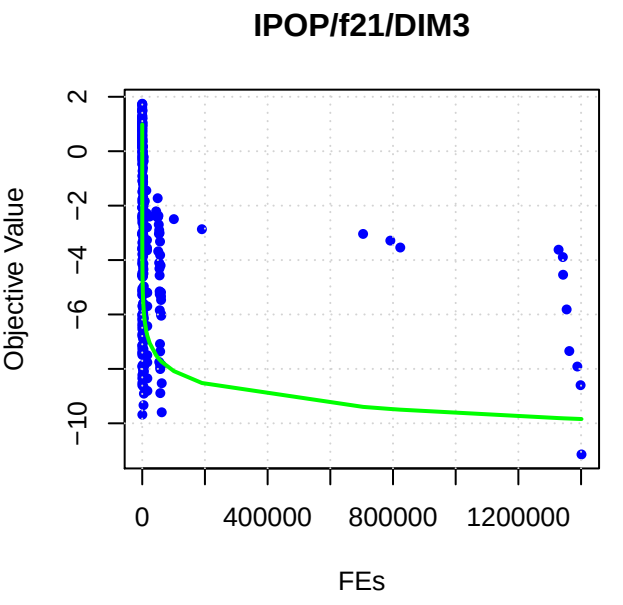
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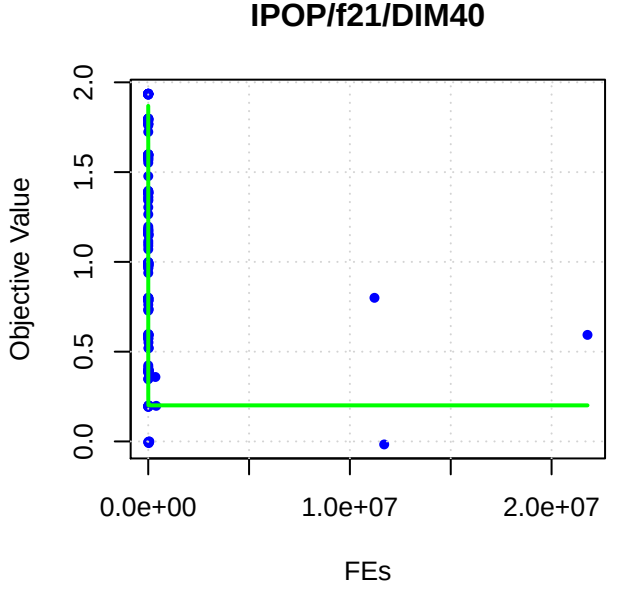
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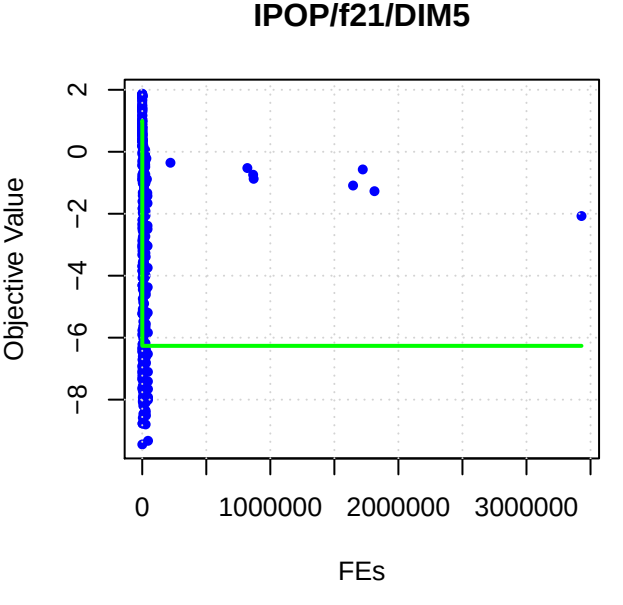
2.0e+07
FEs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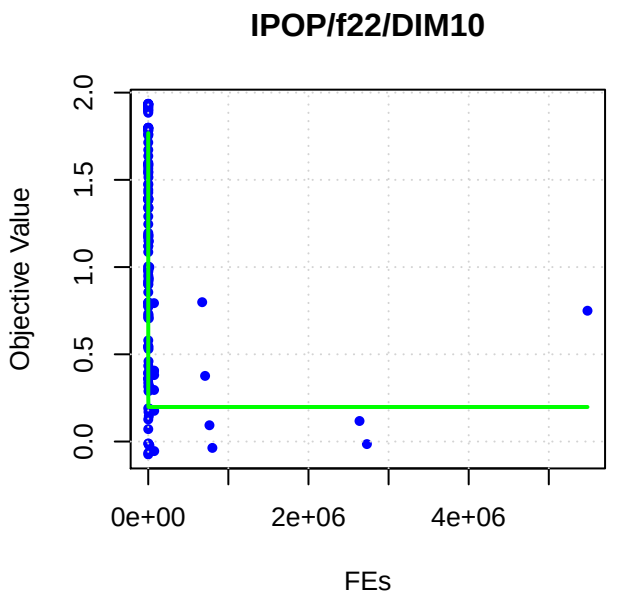
3000000
FEs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2e+06
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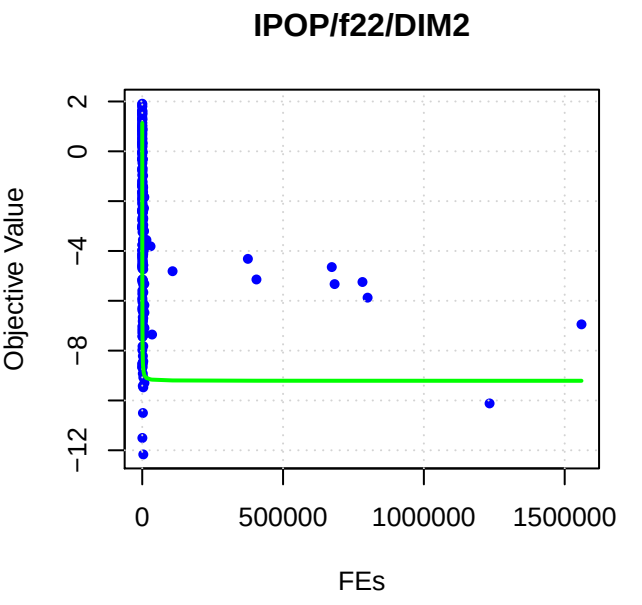
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Objective Value
FEs
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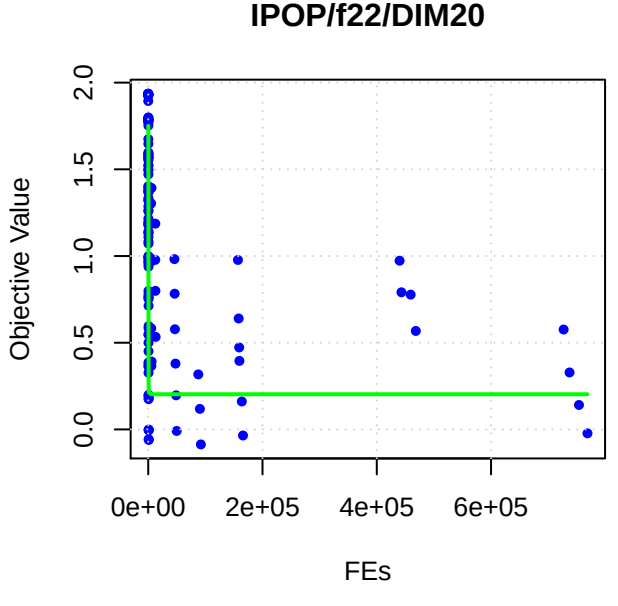
IPOP/f22/DIM20
Objective Value
FEs
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1.0
1.5
2.0
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2e+05
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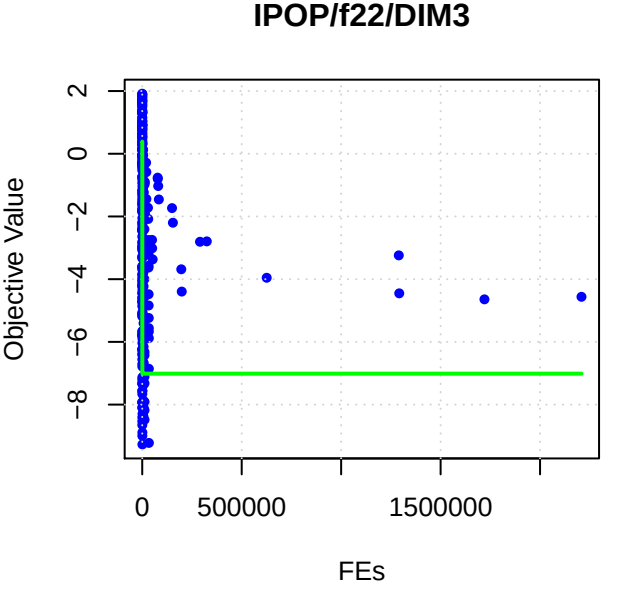
6e+05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Objective Value
FEs
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−8
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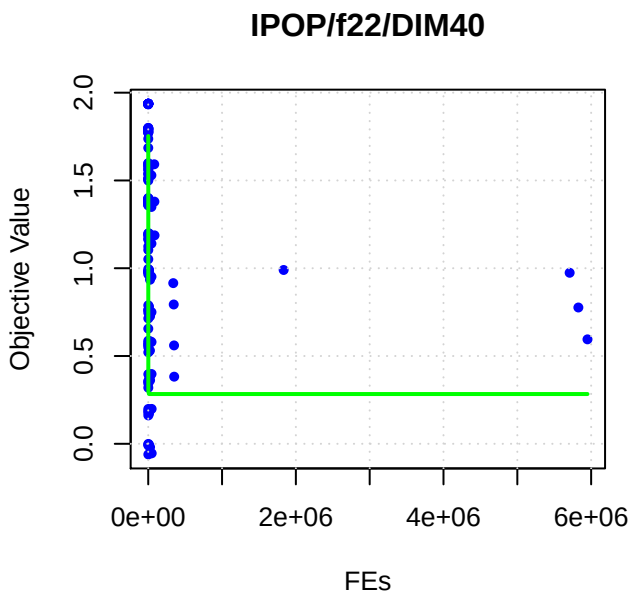
1500000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1.5
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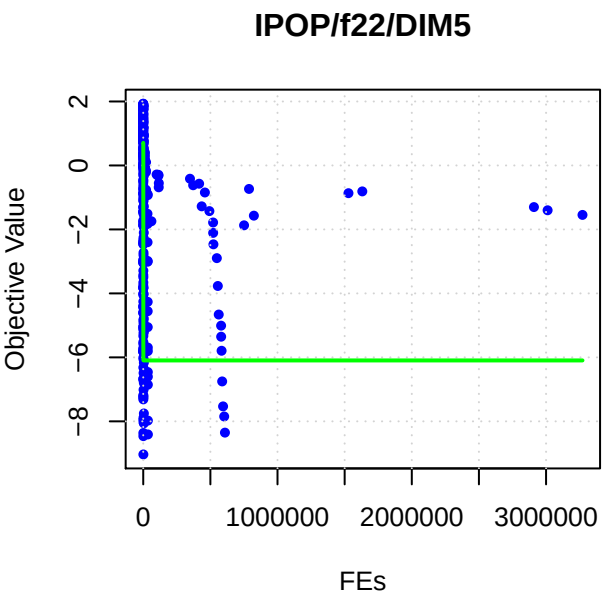
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−8
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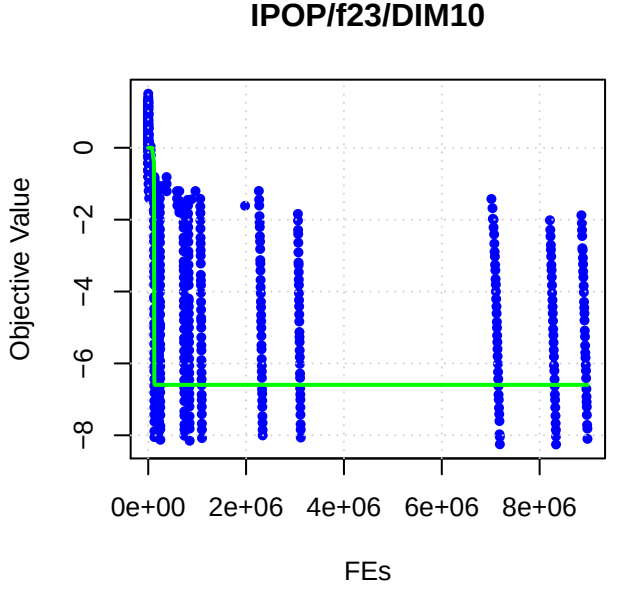
2000000
3000000
FEs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Objective Value
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−4
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−8
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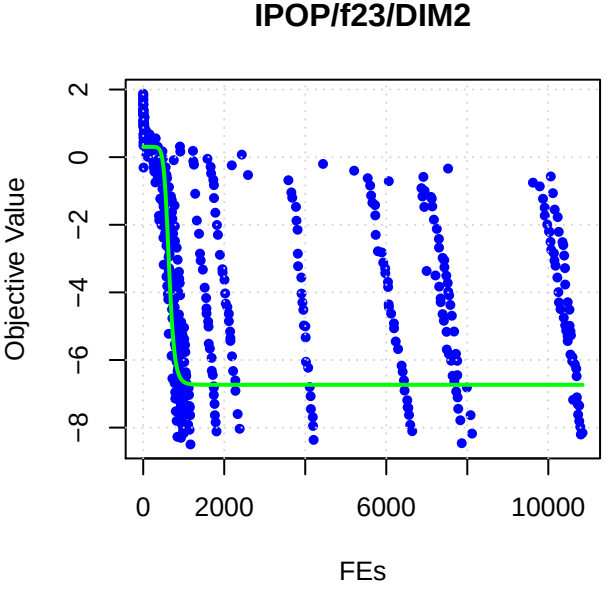
2e+06
4e+06
6e+06
8e+06
FEs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Objective Value
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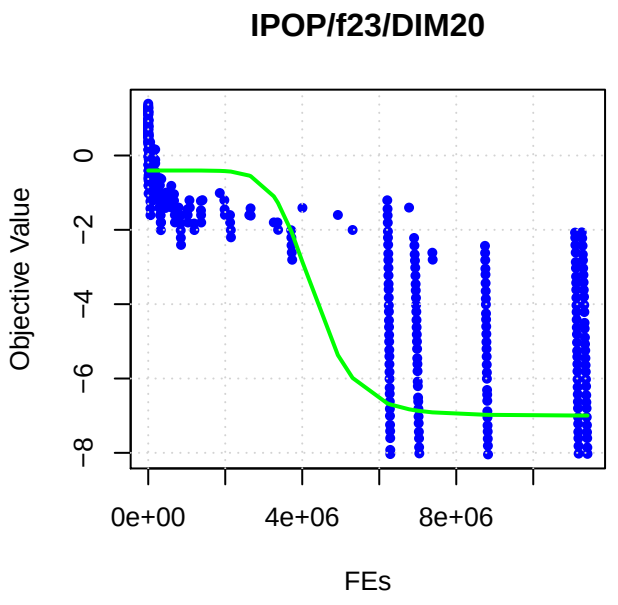
2000
6000
10000
FEs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Objective Value
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−6
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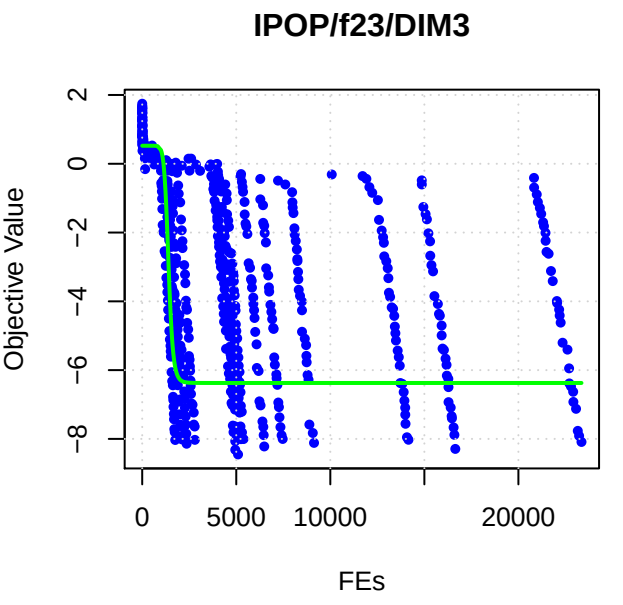
FEs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10000
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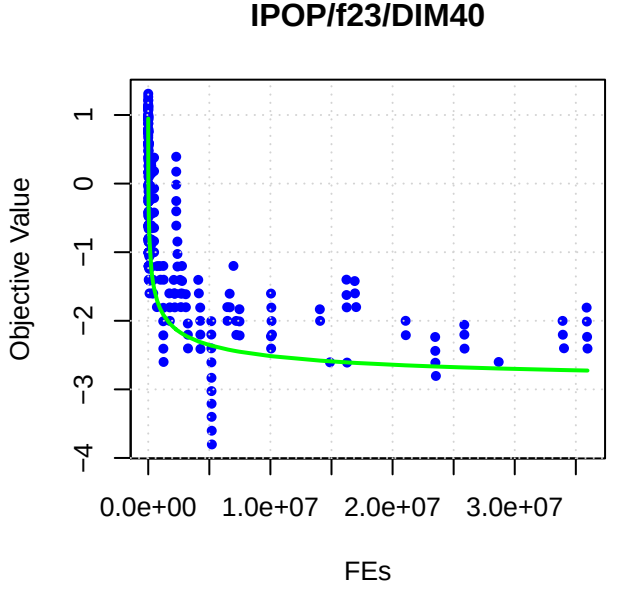
FEs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−3
−4
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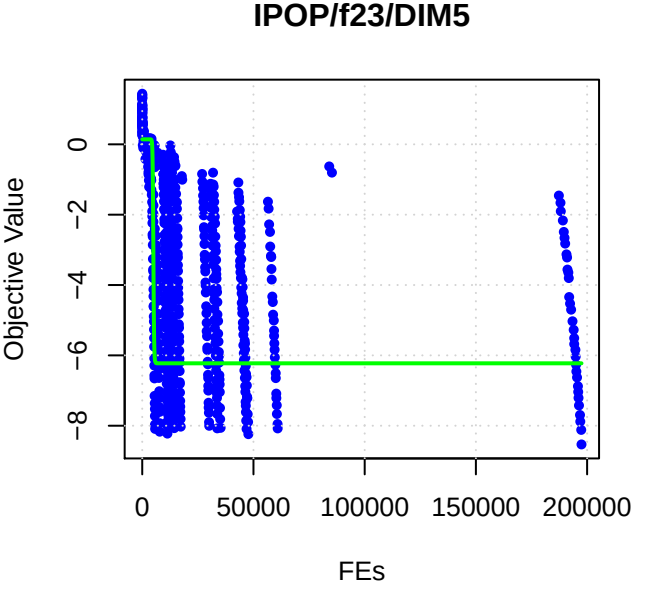
3.0e+07
FEs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Objective Value
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−4
−6
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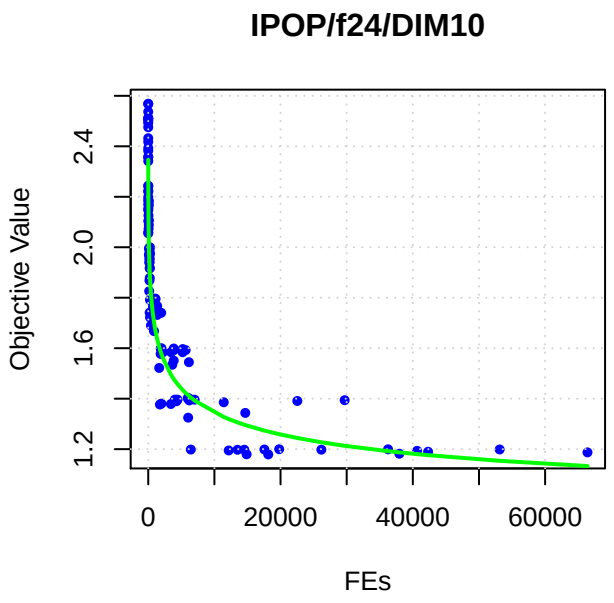
100000
150000
200000
FEs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2.4
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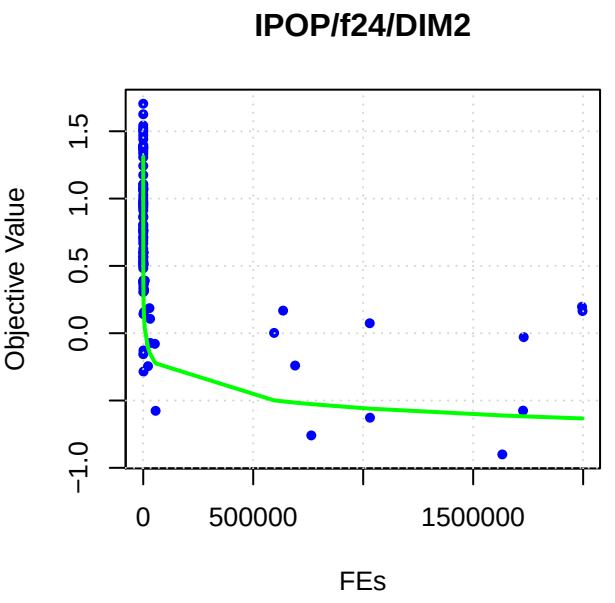
40000
60000
FEs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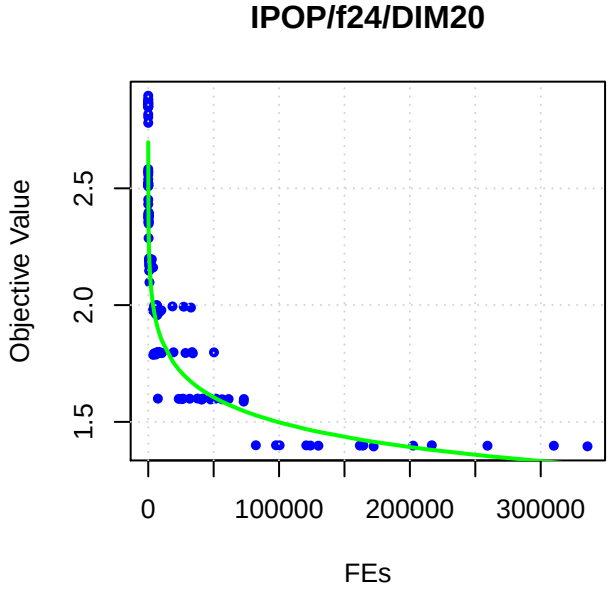
0.5
1.0
1.5
0
500000
1500000
FEs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Objective Value
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2.5
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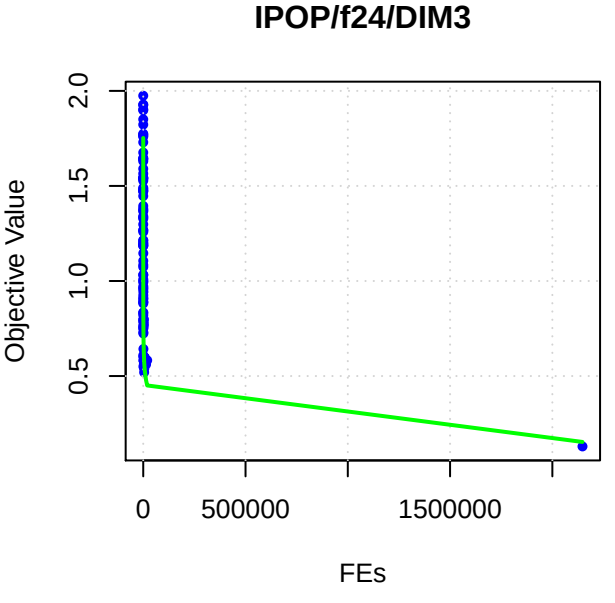
200000
300000
FEs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1.5
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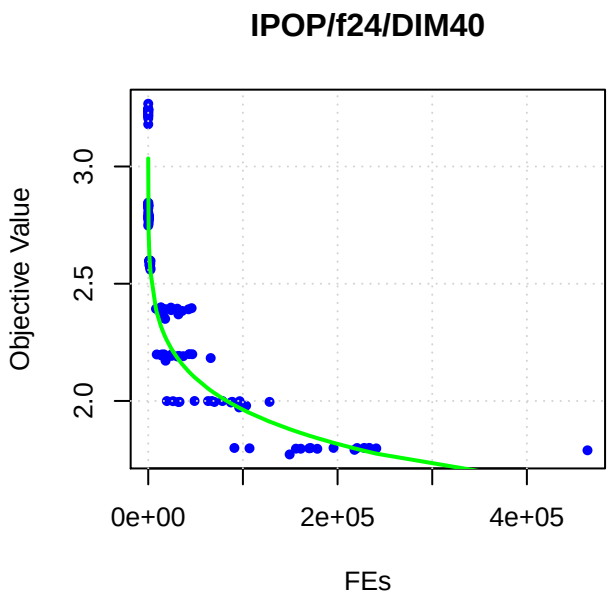
FEs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Objective Value
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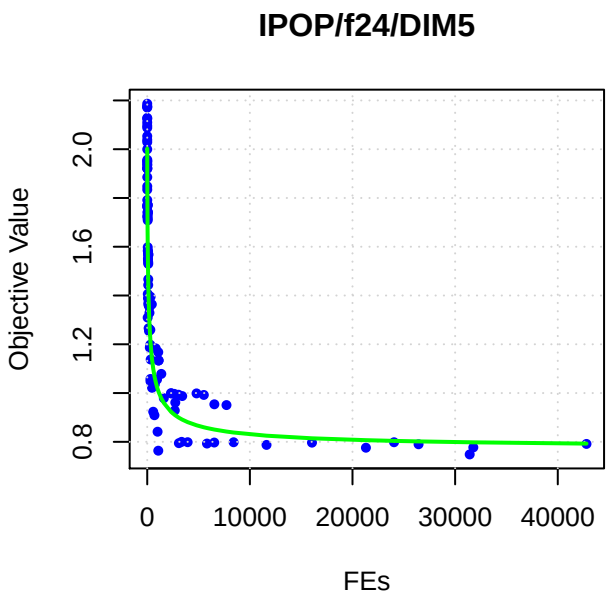
FEs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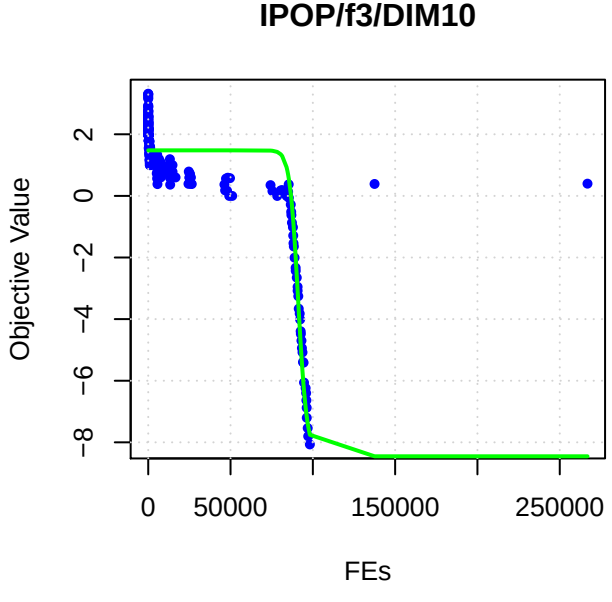
FEs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Objective Value
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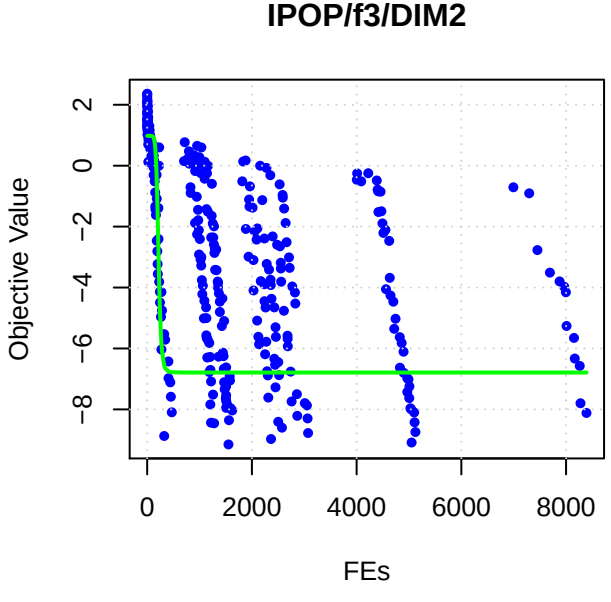
FEs


IPOP/f3/DIM2
Objective Value
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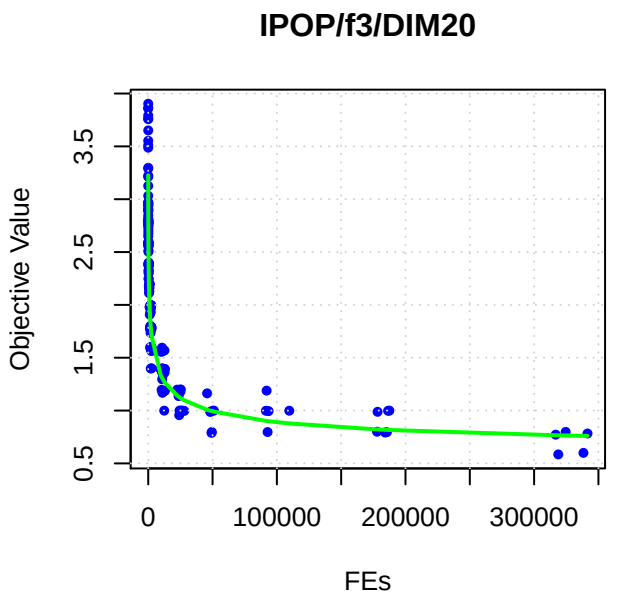
FEs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3.5
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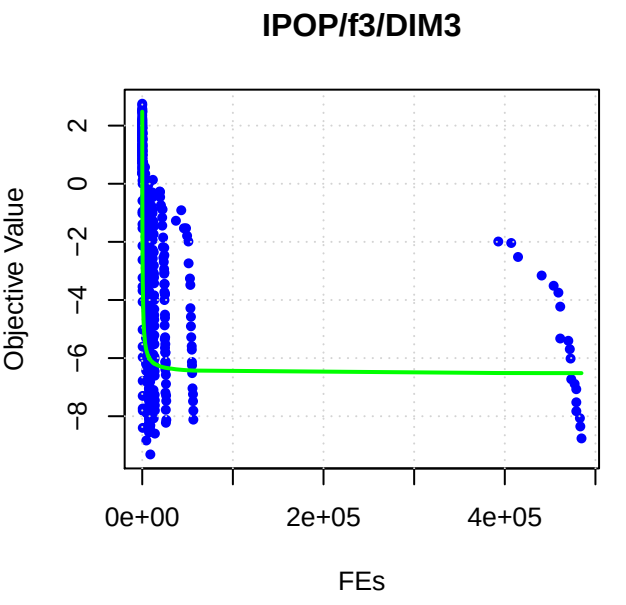
FEs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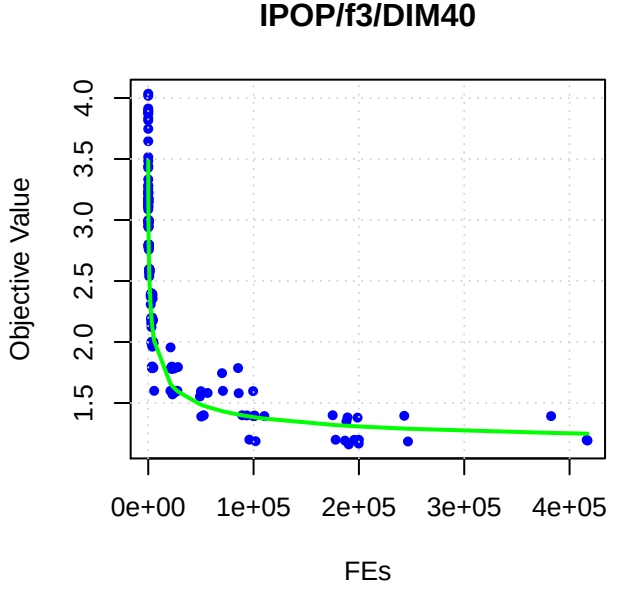
IPOP/f3/DIM40
Objective Value
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3.0
3.5
4.0
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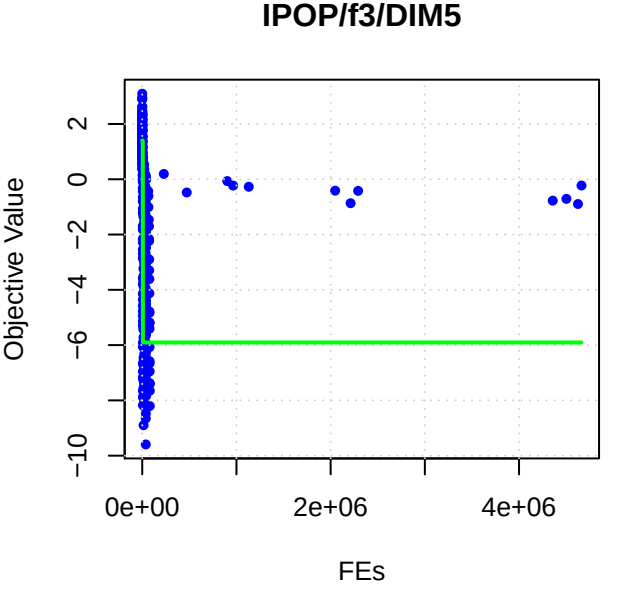
4e+05
FEs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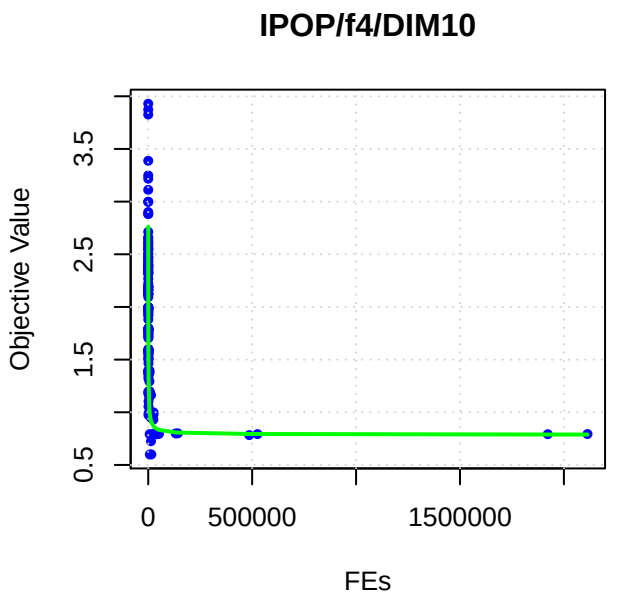
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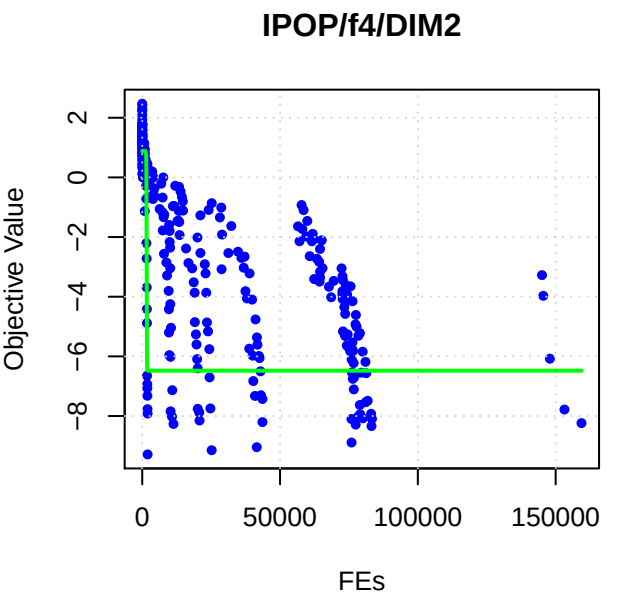
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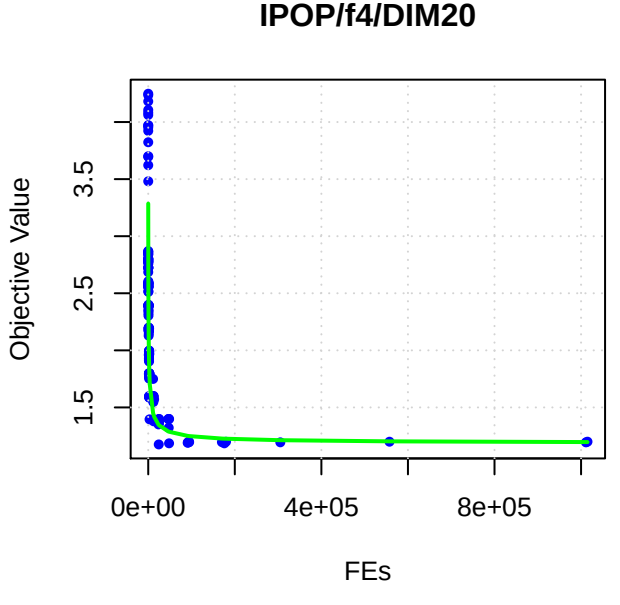
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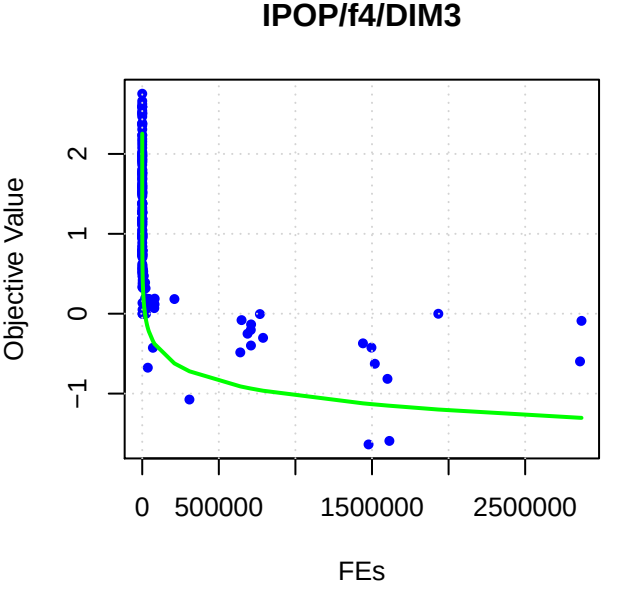
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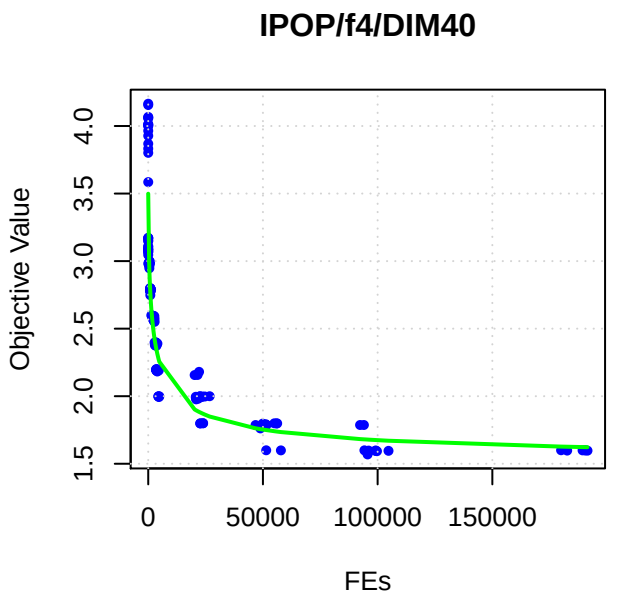
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FEs
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150000
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3.5
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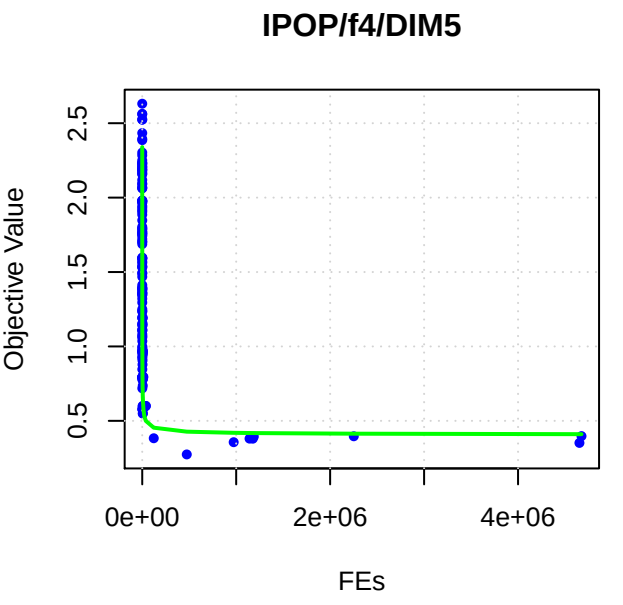
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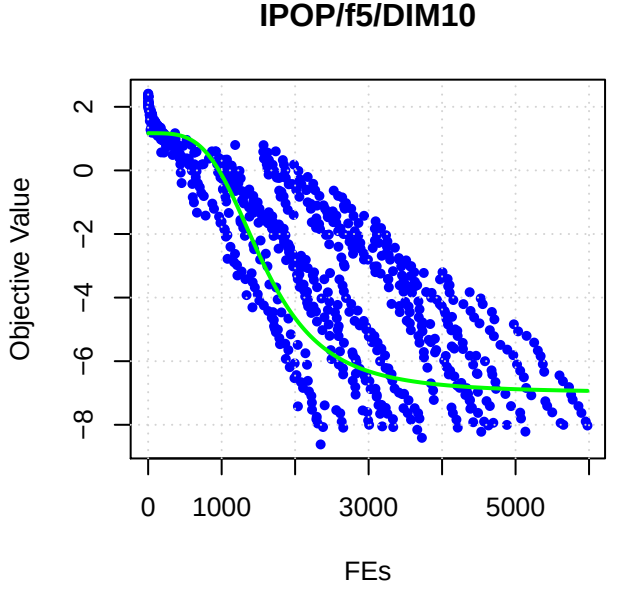
2.5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FEs
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5000
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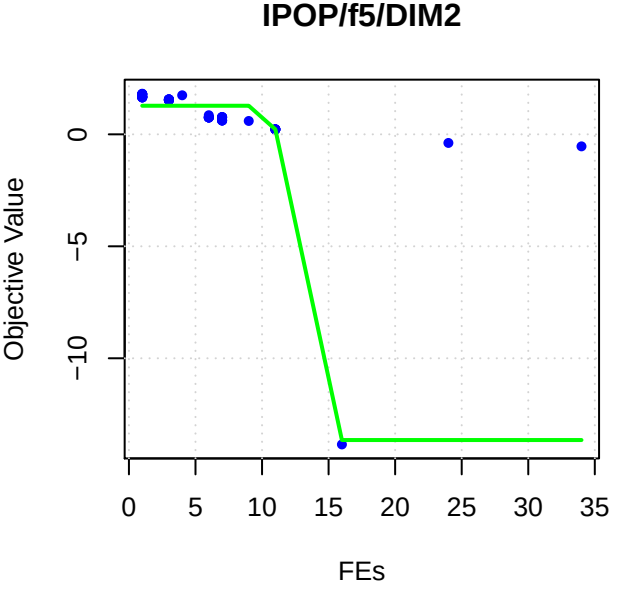
2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Objective Value
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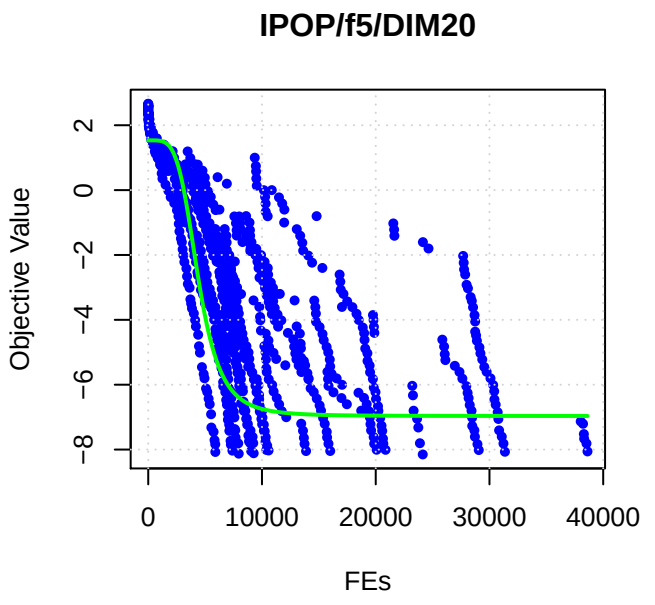
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30000
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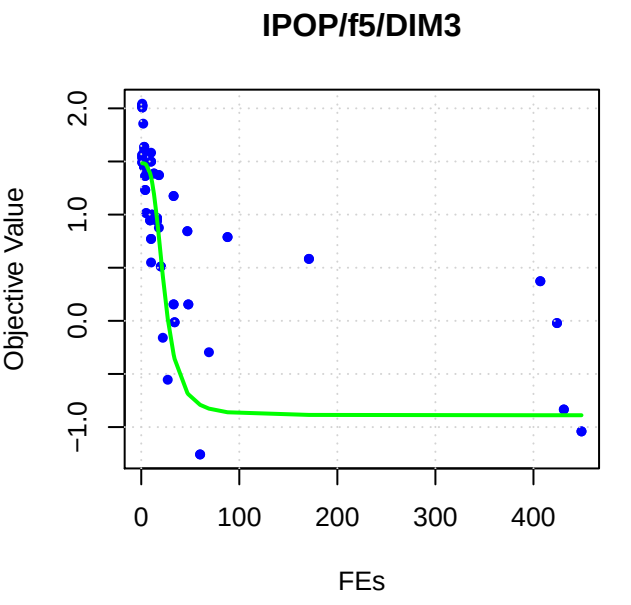
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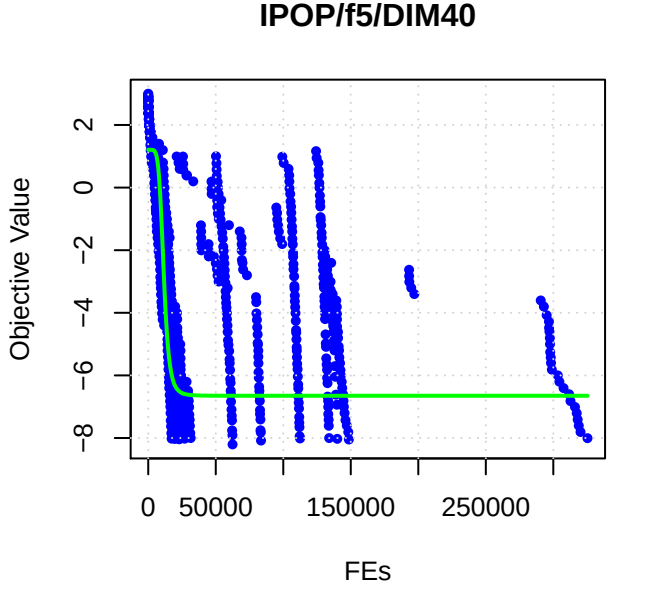
200
300
400
FEs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Objective Value
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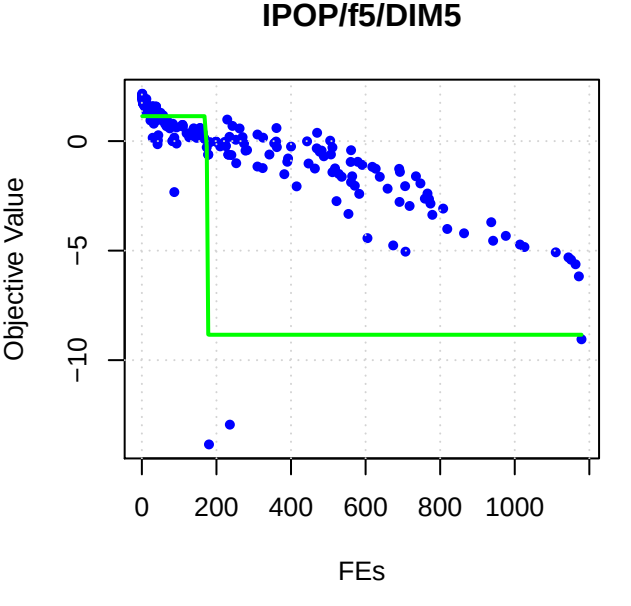
150000
250000
FEs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−10
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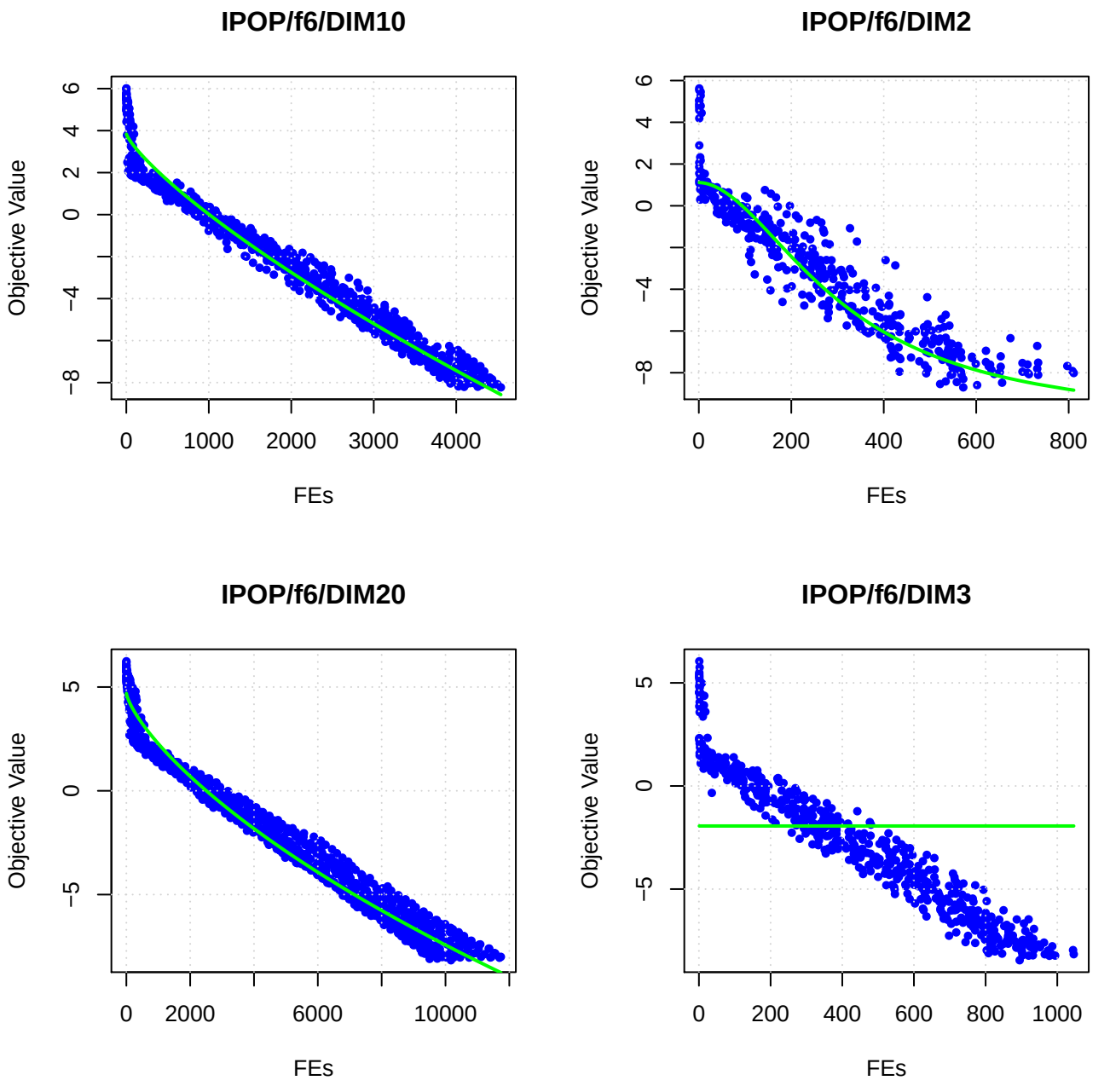
600
800
1000
FEs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Objective Value
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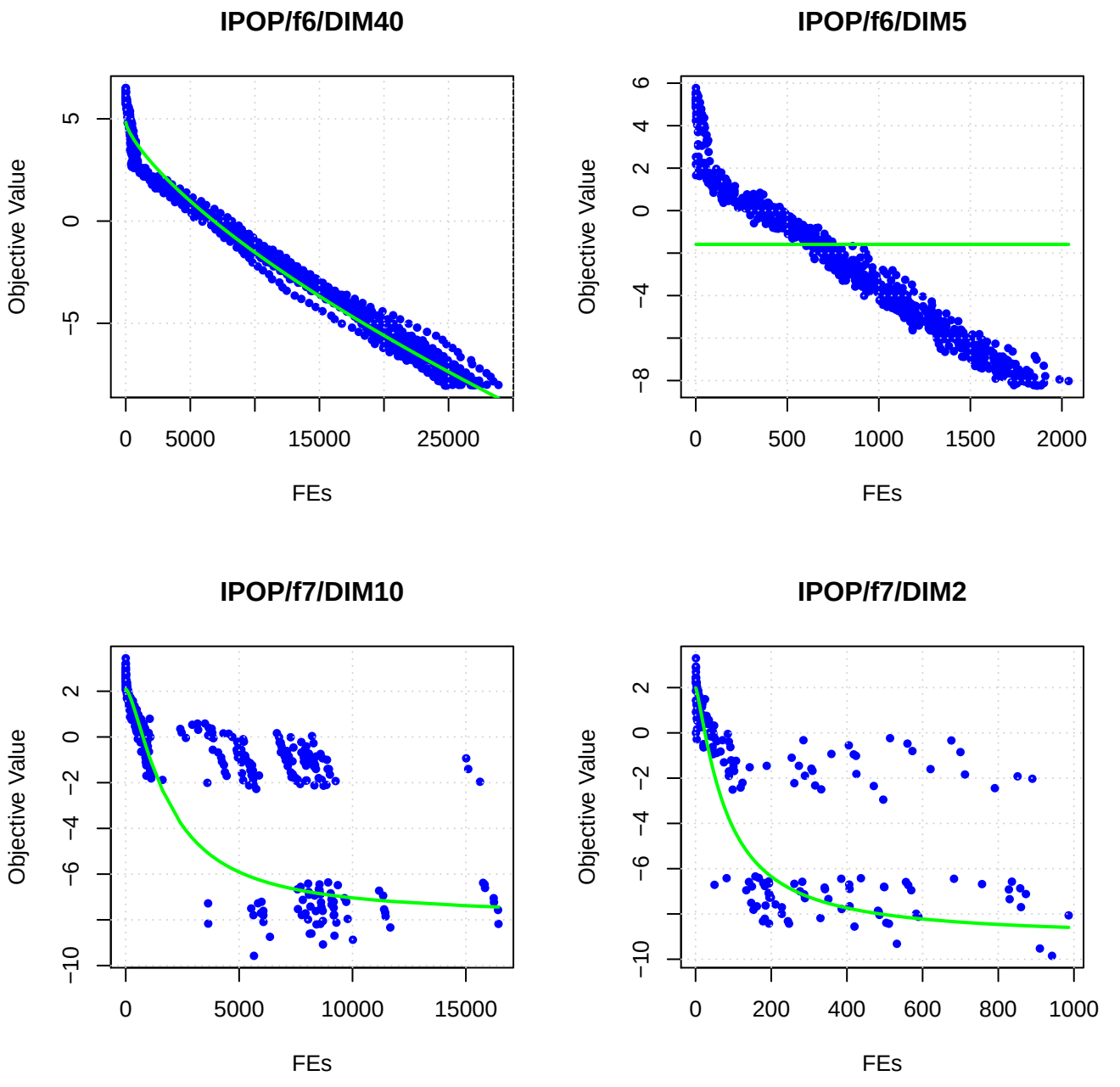
IPOP/f6/DIM2
Objective Value
FEs
IPOP/f6/DIM20
Objective Value
FEs
IPOP/f6/DIM3
Objective Value
FEs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Objective Value
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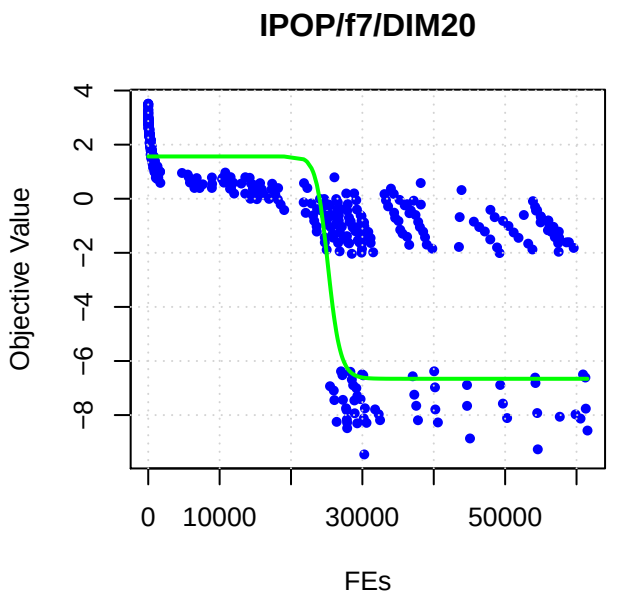
Objective Value
FEs
IPOP/f7/DIM10
Objective Value
FEs
IPOP/f7/DIM2
Objective Value
FEs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Objective Value
FEs
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−8
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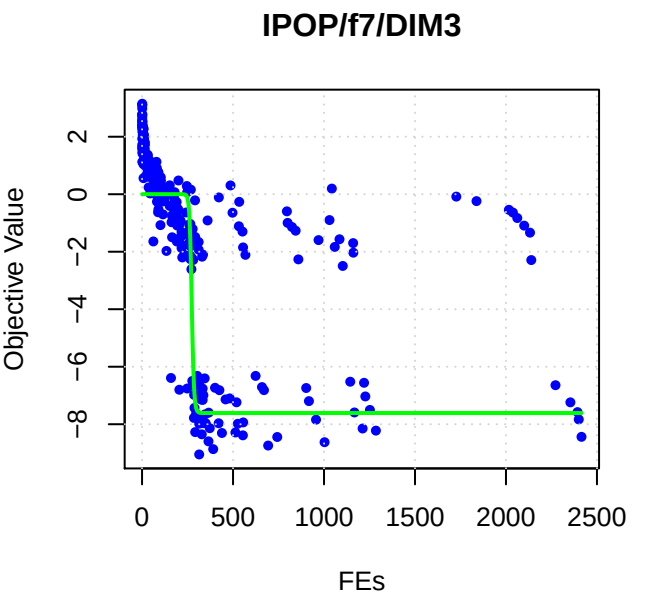
10000
30000
50000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Objective Value
FEs
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−4
−6
−8
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1000
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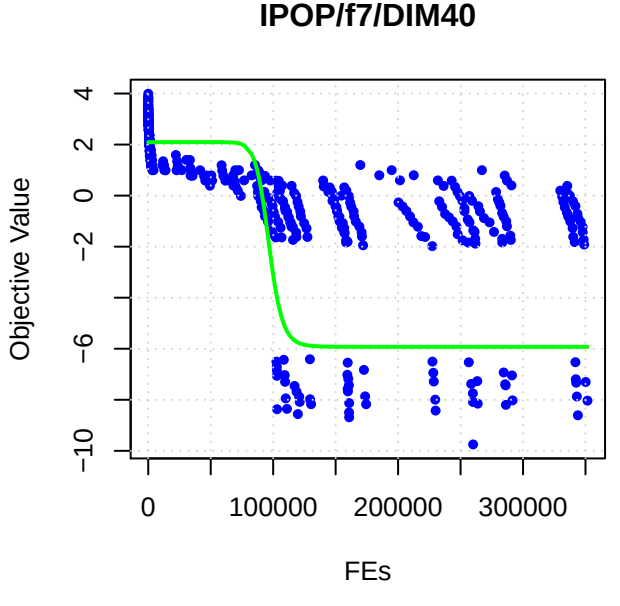
2000
2500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Objective Value
FEs
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200000
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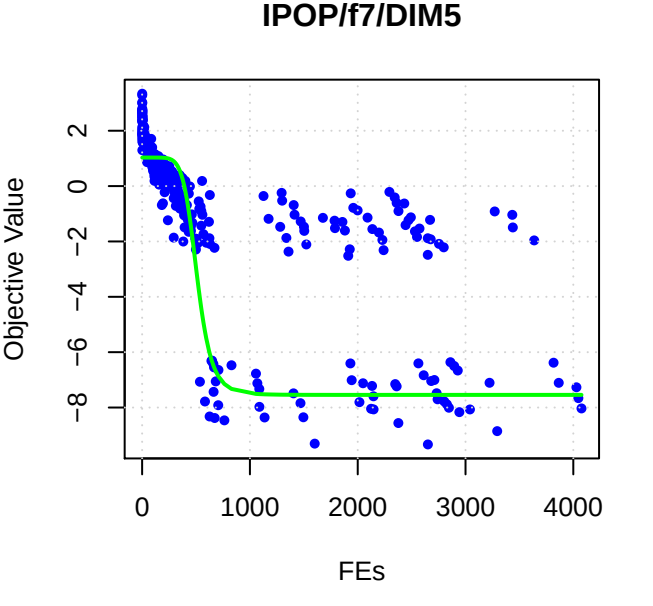
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Objective Value
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3000
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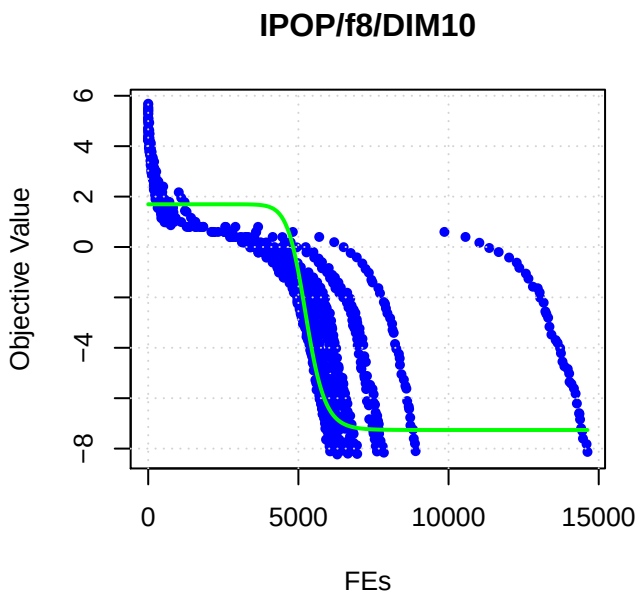
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Objective Value
FEs
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2
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−8
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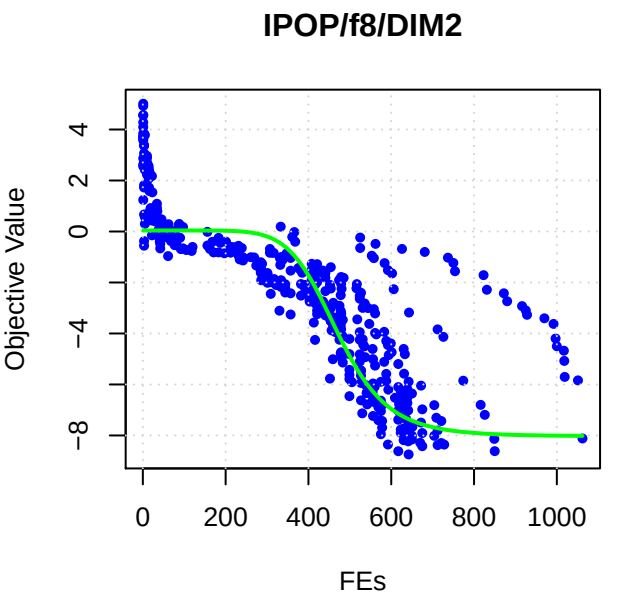
10000
15000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Objective Value
FEs
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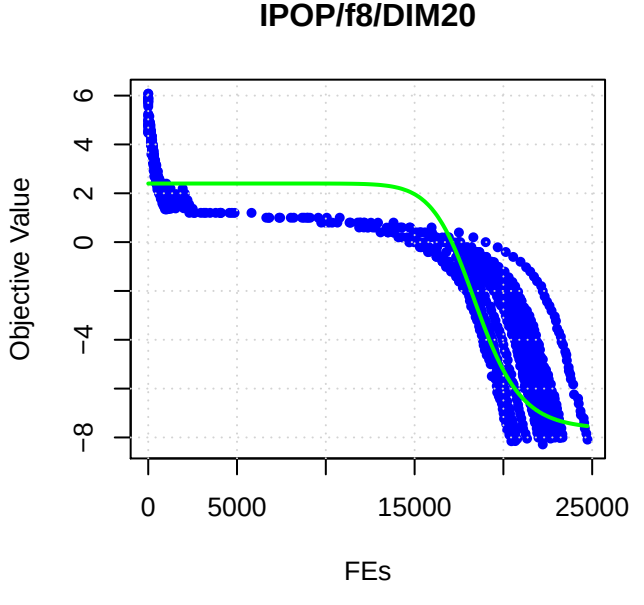
400
600
800
1000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Objective Value
FEs
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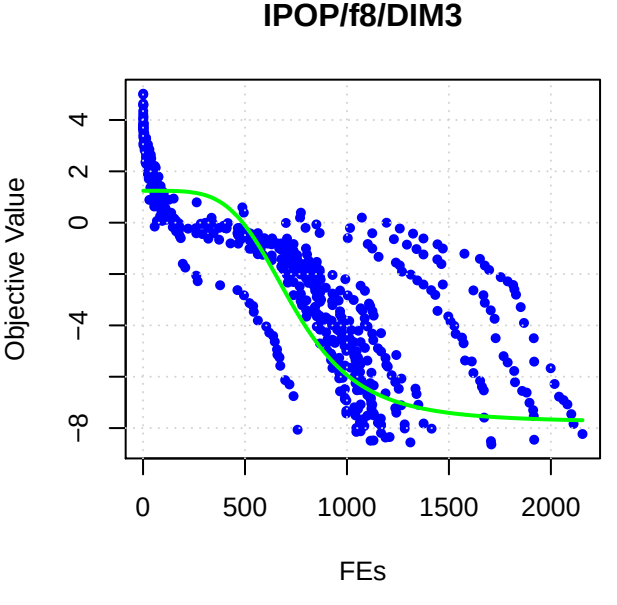
25000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Objective Value
FEs
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−4
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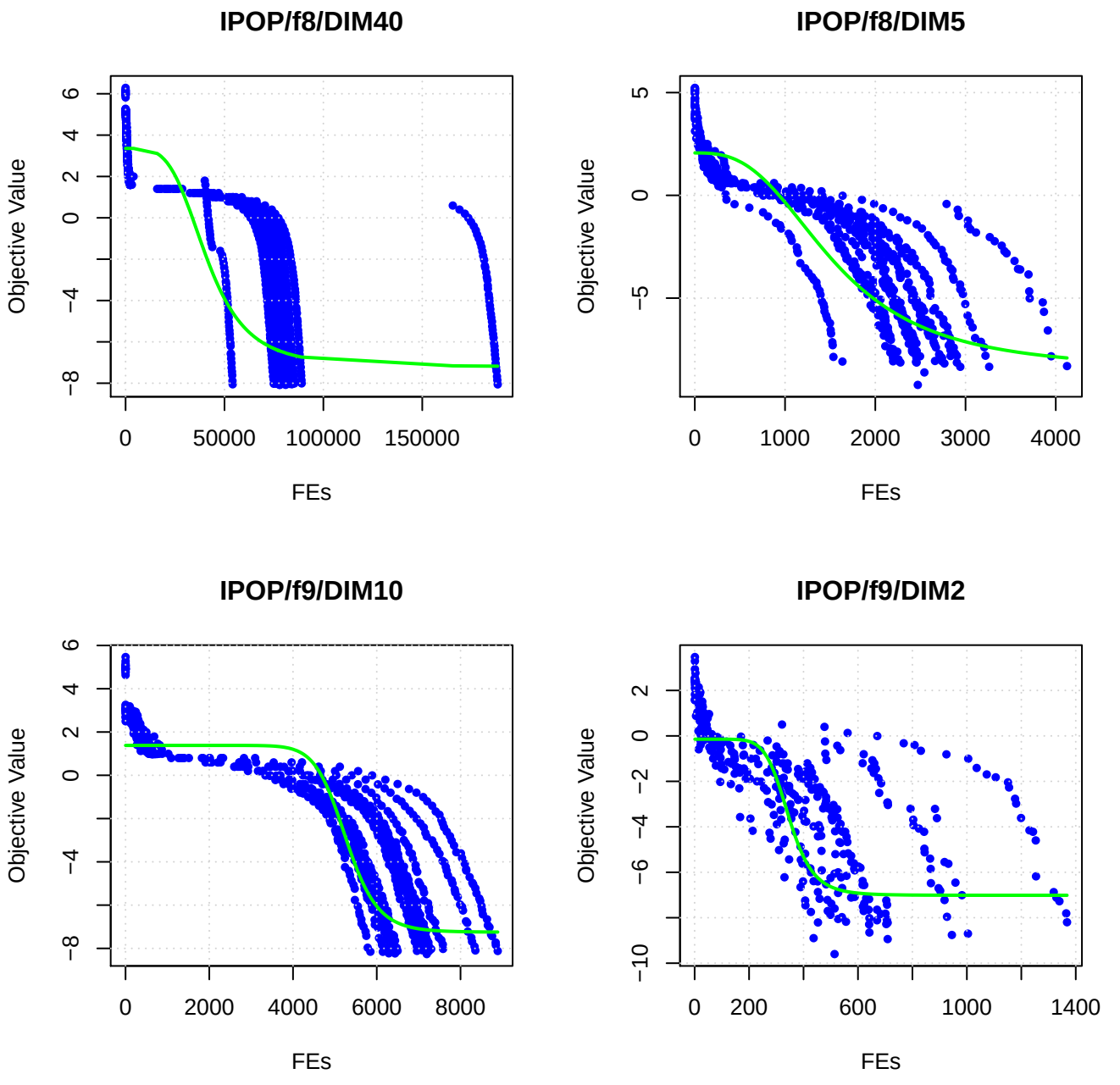
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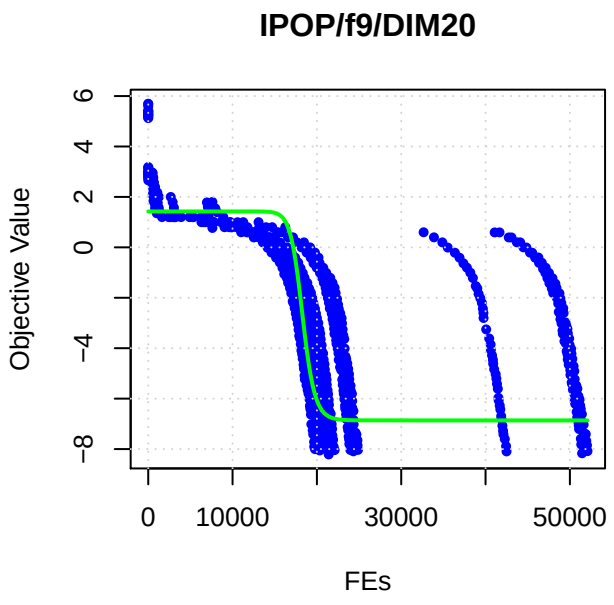
Objective Value
FEs
IPOP/f8/DIM5
Objective Value
FEs
IPOP/f9/DIM10
Objective Value
FEs
IPOP/f9/DIM2
Objective Value
FEs


IPOP/f9/DIM20
Objective Value
FEs
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−4
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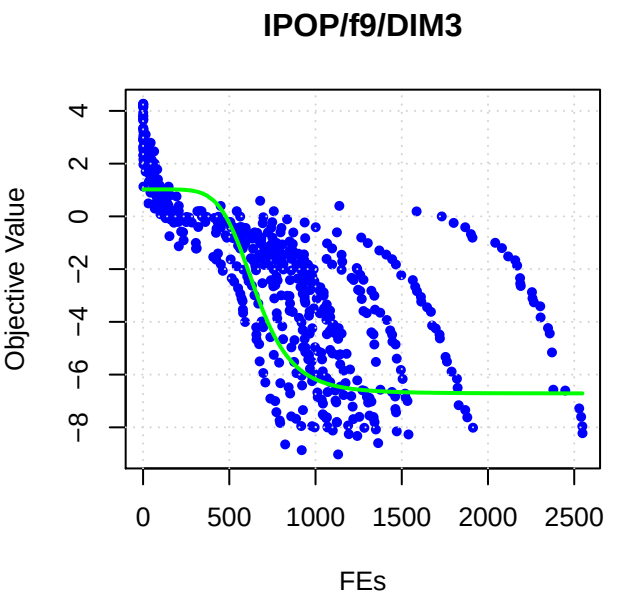
50000


IPOP/f9/DIM3
Objective Value
FEs
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−6
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2000
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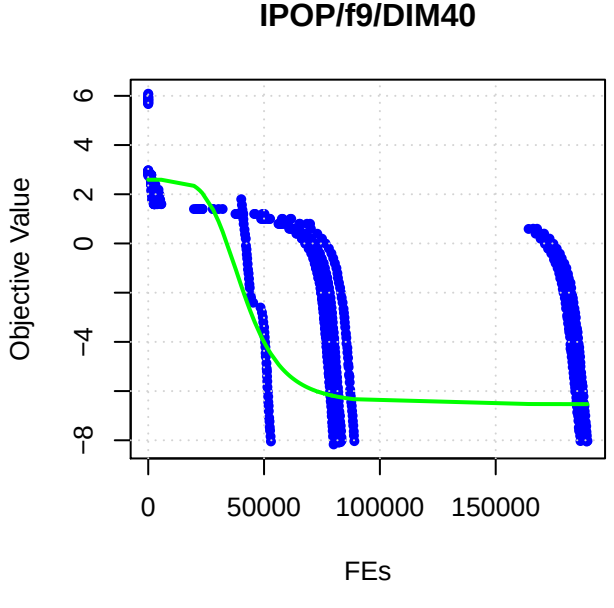
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Objective Value
FEs
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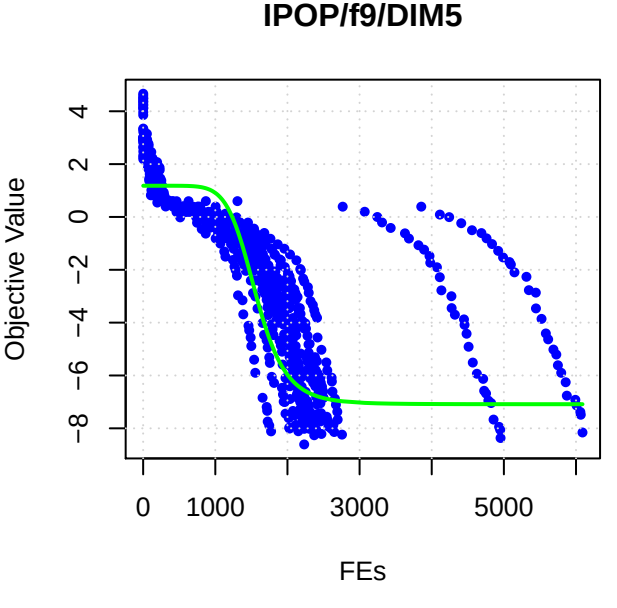
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Objective Value
FEs
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2
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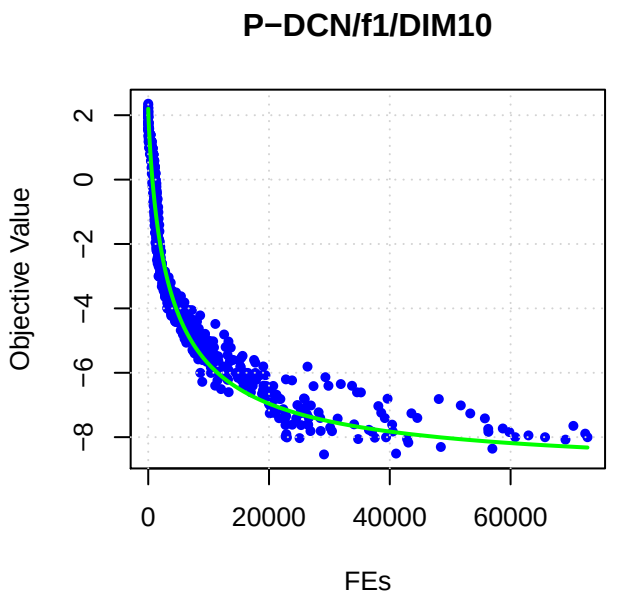
−2
−4
−6
−8
0
1000
3000
5000


P−DCN/f1/DIM10
Objective Value
FEs
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−2
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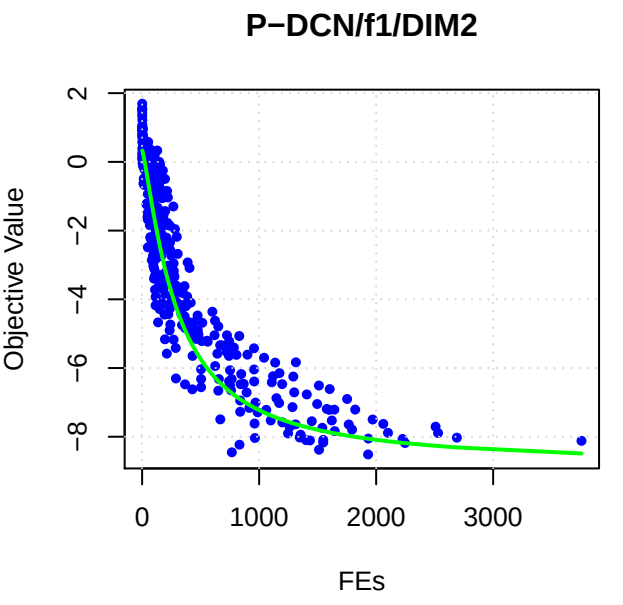
40000
60000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Objective Value
FEs
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−6
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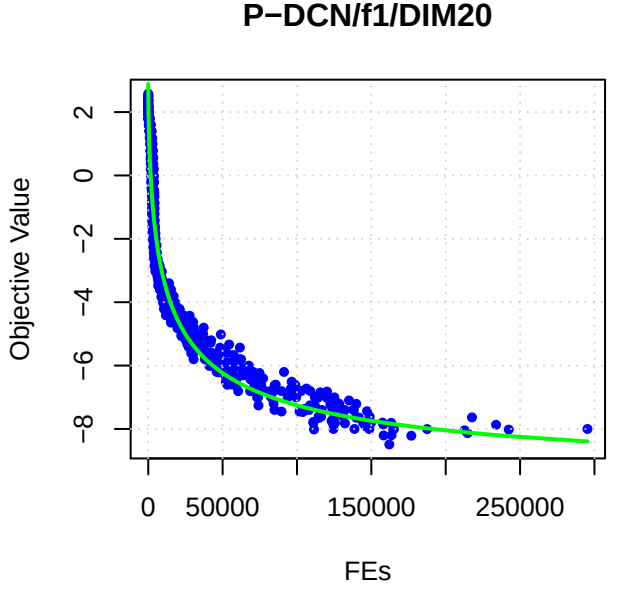
2000
3000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Objective Value
FEs
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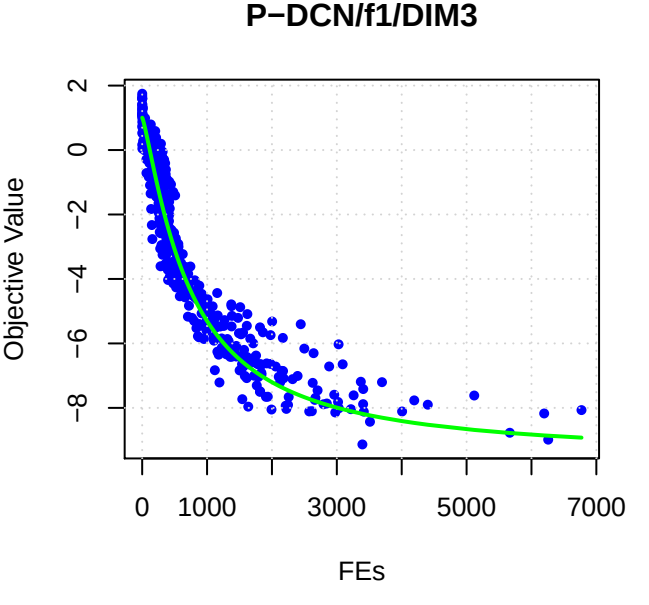
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Objective Value
FEs
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−2
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−6
−8
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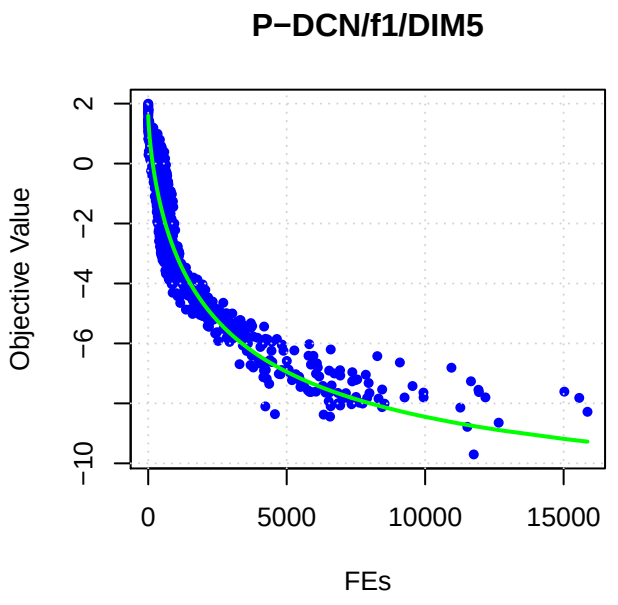
3000
5000
7000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Objective Value
FEs
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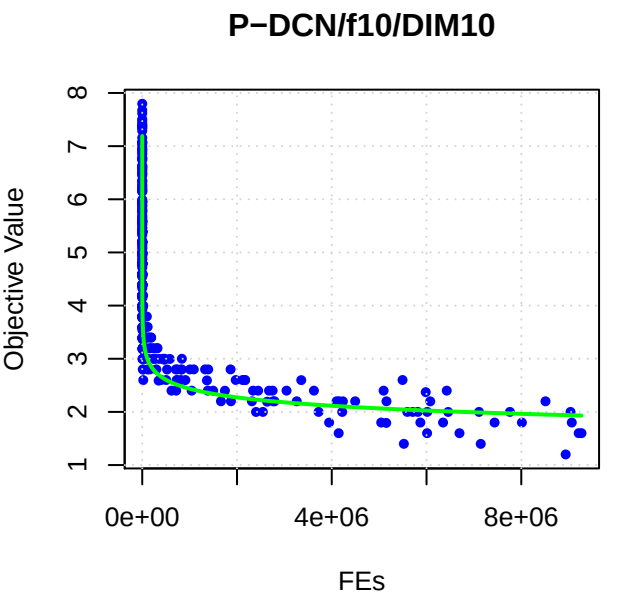
−2
−4
−6
−10
0
5000
10000
15000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Objective Value
FEs
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7
6
5
4
3
2
1
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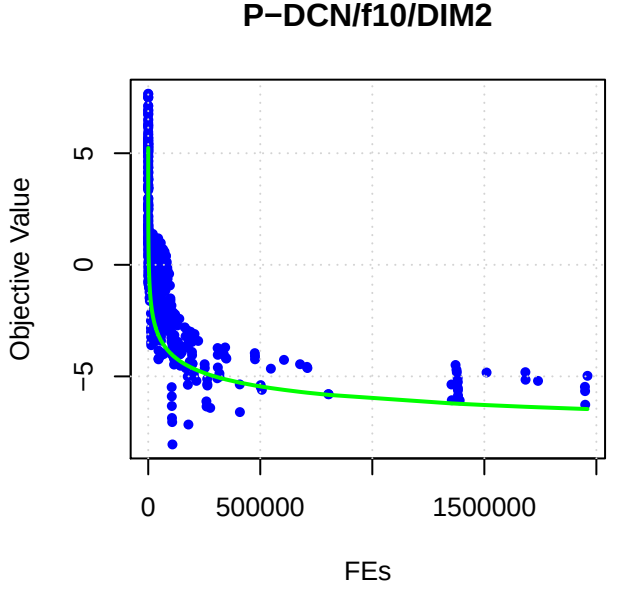
4e+06
8e+06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Objective Value
FEs
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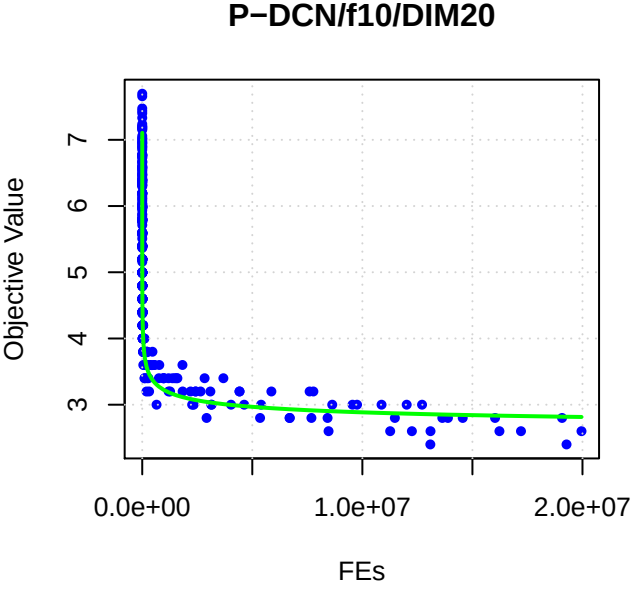
0
500000
1500000


P−DCN/f10/DIM20
Objective Value
FEs
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4
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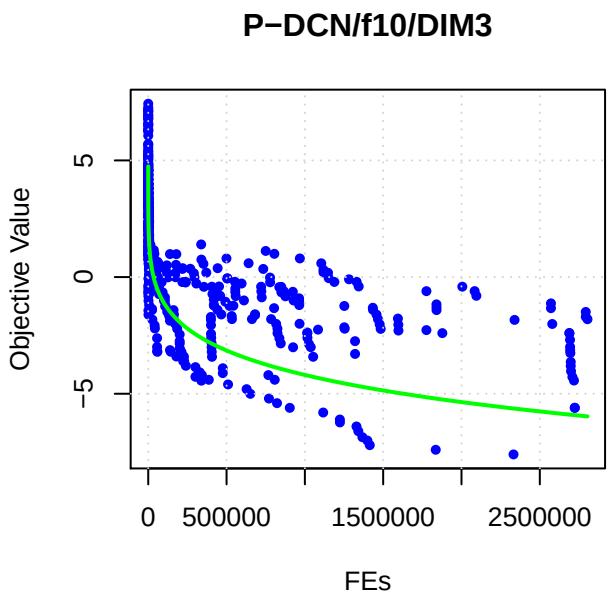
2.0e+07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Objective Value
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−5
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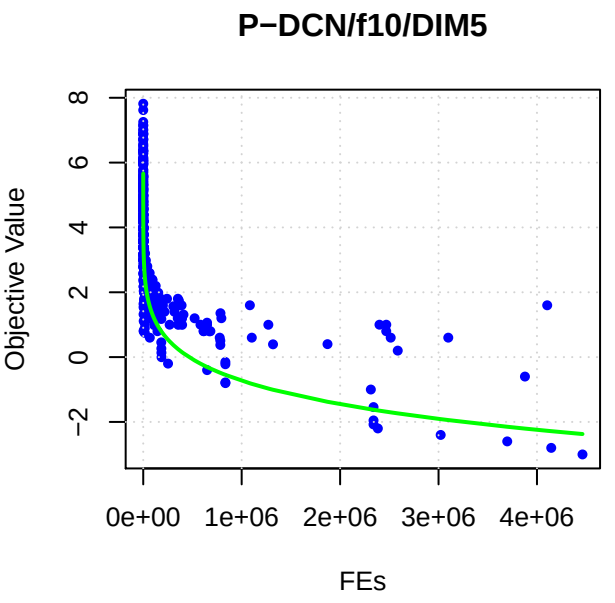
500000
1500000
2500000
FEs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Objective Value
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4
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−2
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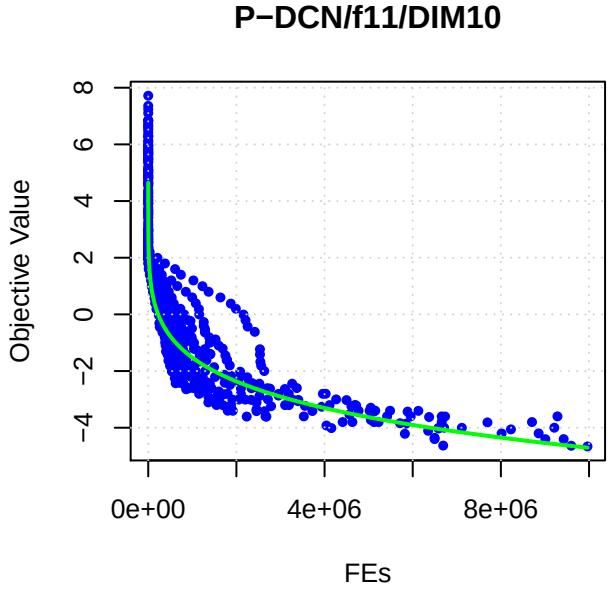
1e+06
2e+06
3e+06
4e+06
FEs


P−DCN/f11/DIM10
Objective Value
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4
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−2
−4
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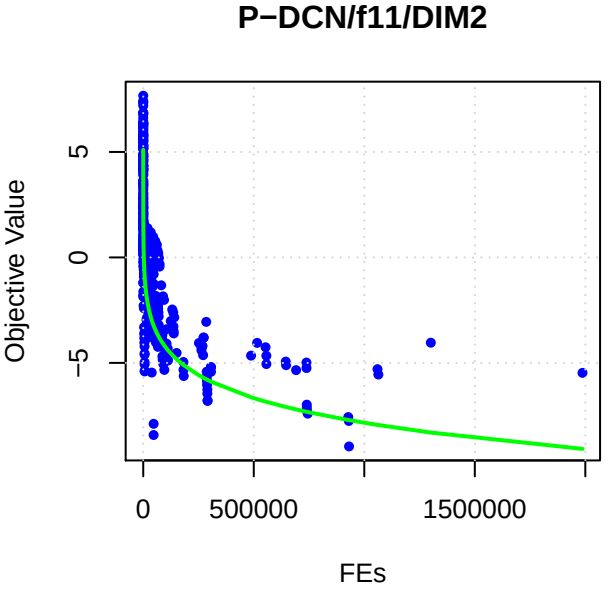
8e+06
FEs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Objective Value
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−5
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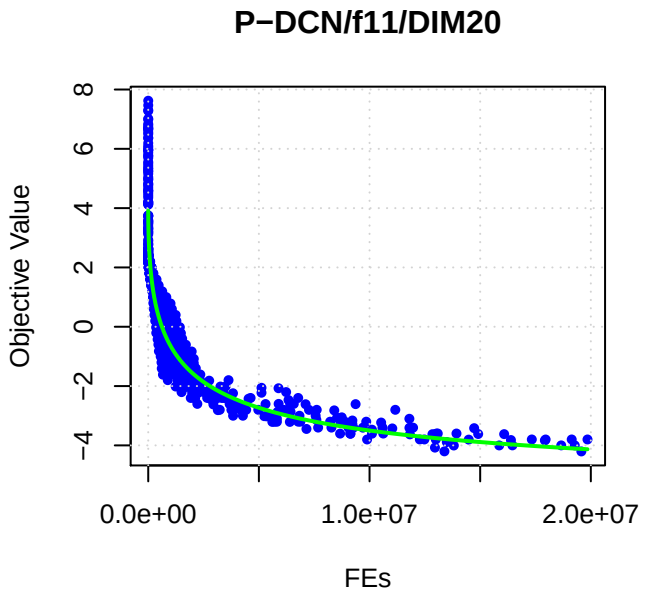
500000
1500000
FEs


P−DCN/f11/DIM20
Objective Value
FEs
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1.0e+07
2.0e+07
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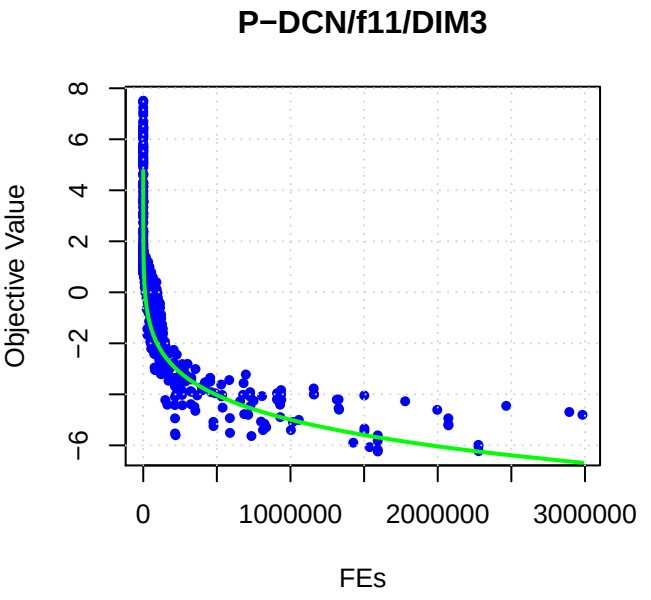
6
4
2
0
−2
−4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Objective Value
FEs
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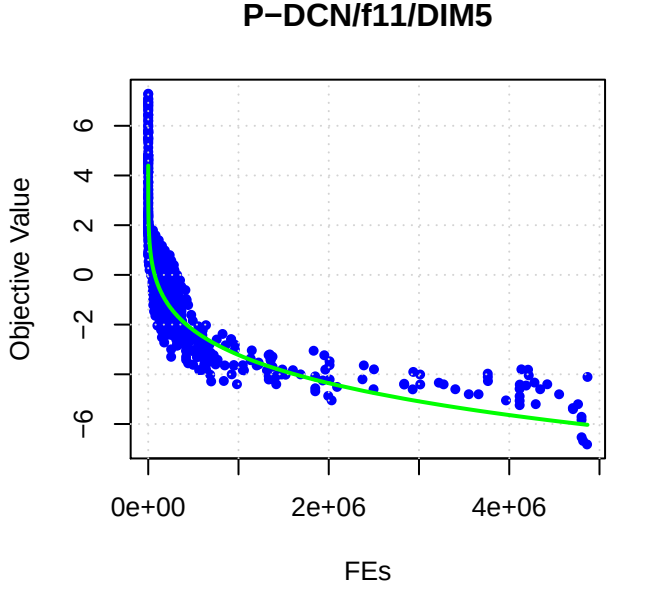
2000000
3000000
8
6
4
2
0
−2
−6


P−DCN/f11/DIM5
Objective Value
FEs
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2e+06
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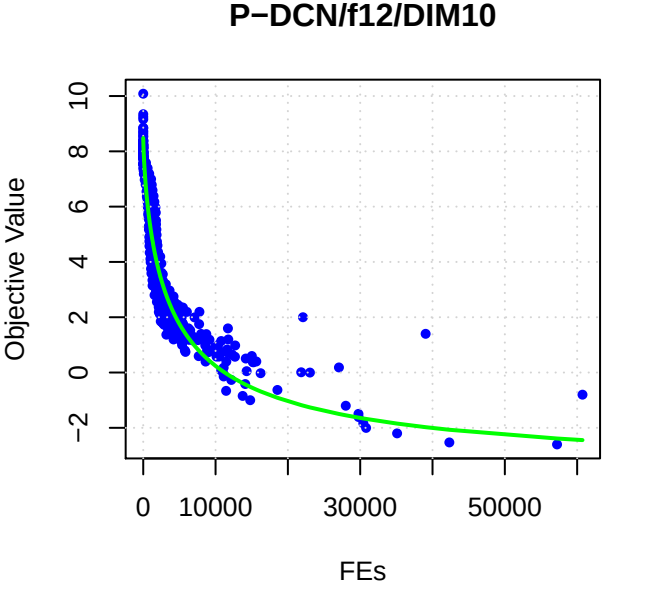
4
2
0
−2
−6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Objective Value
FEs
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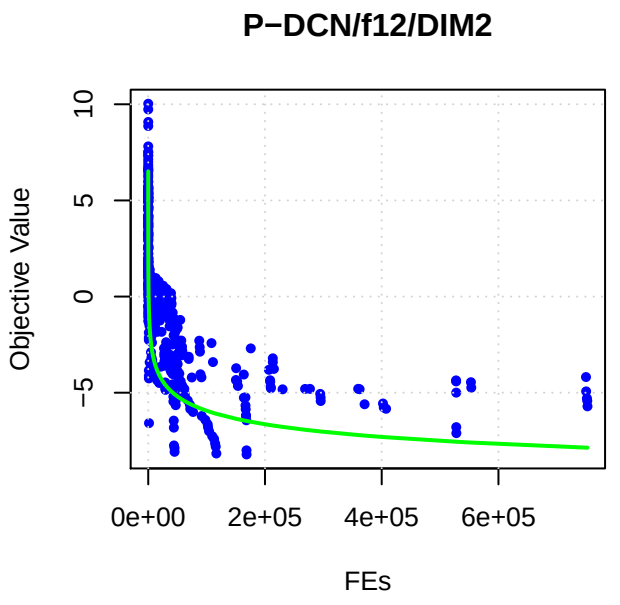
10000
30000
50000
10
8
6
4
2
0
−2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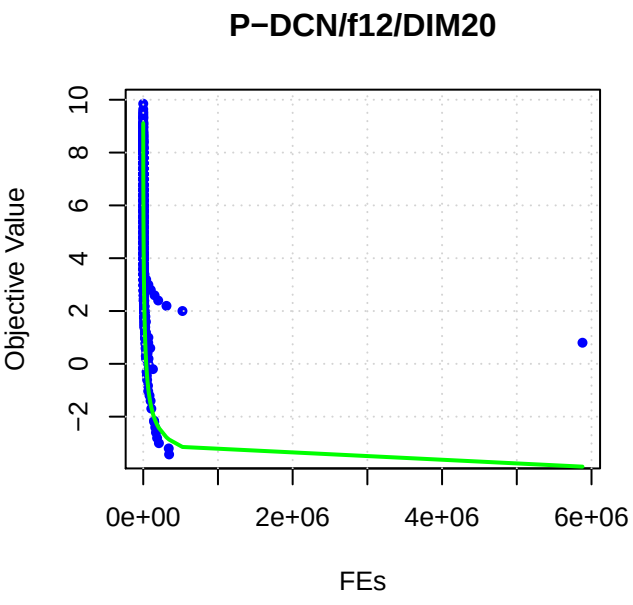
FEs


P−DCN/f12/DIM20
Objective Value
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8
6
4
2
0
−2
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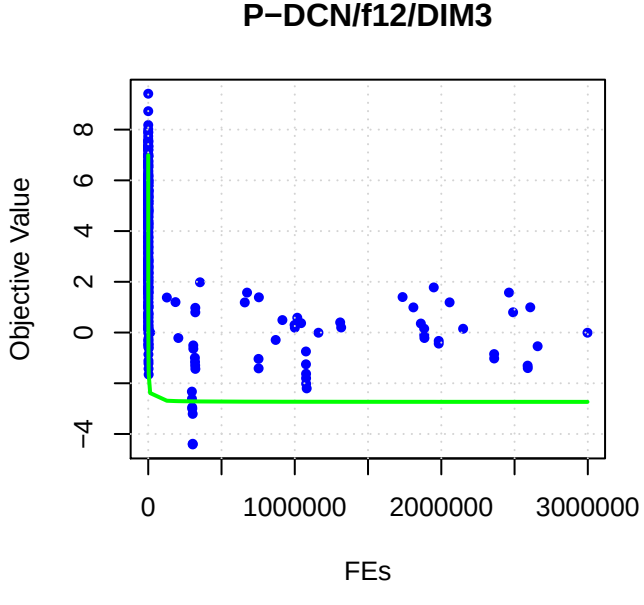
2e+06
4e+06
6e+06
FEs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Objective Value
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4
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−4
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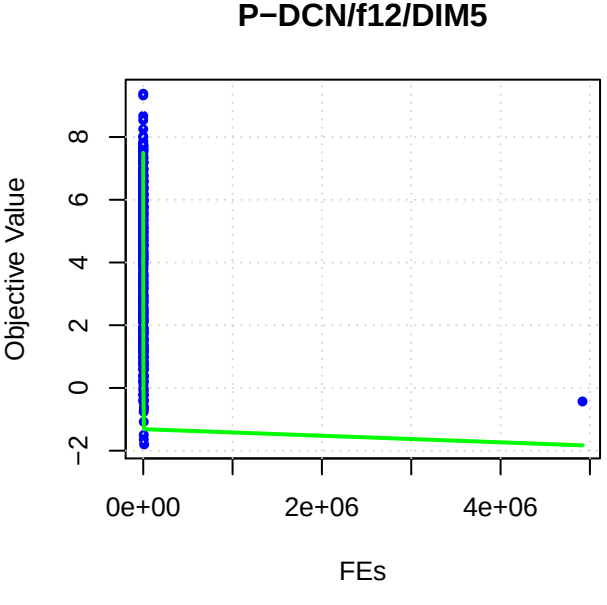
2000000
3000000
FEs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Objective Value
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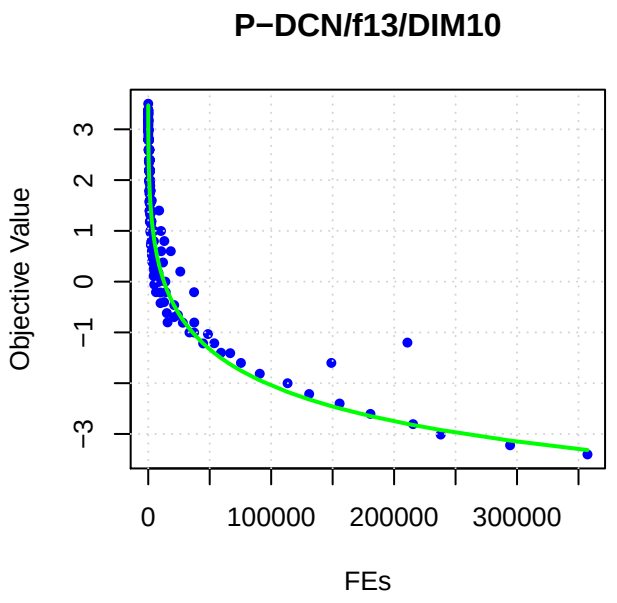
4e+06
FEs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Objective Value
FEs
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−1
−3
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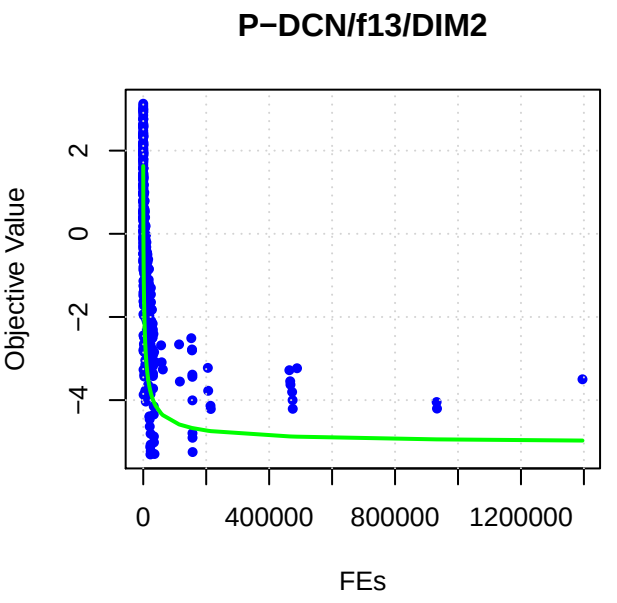
200000
300000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Objective Value
FEs
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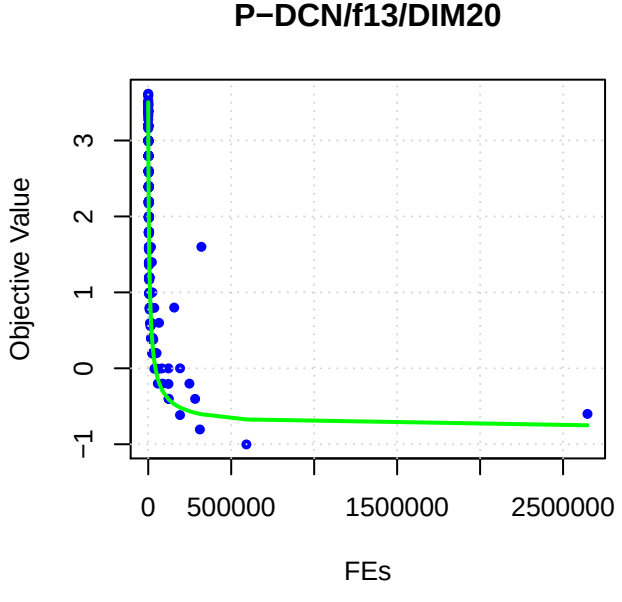
P−DCN/f13/DIM20
Objective Value
FEs
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0
−1
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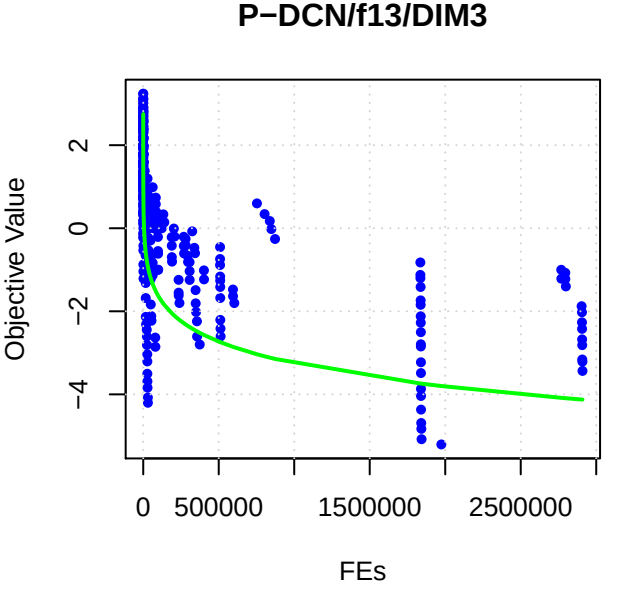
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Objective Value
FEs
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500000
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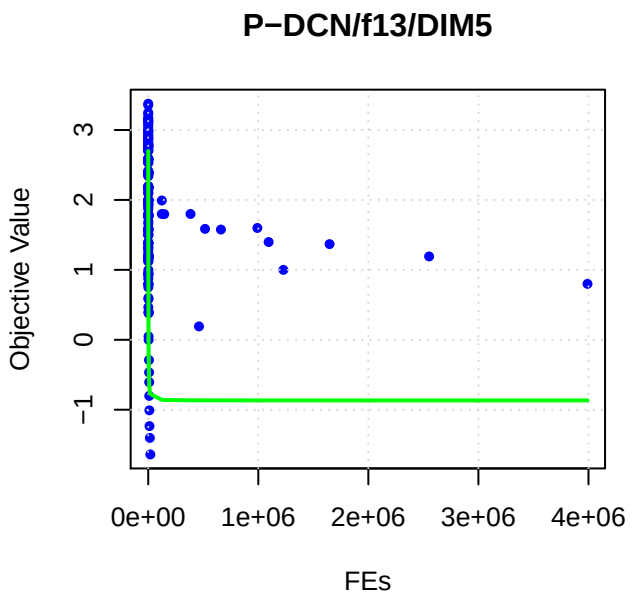
P−DCN/f13/DIM5
Objective Value
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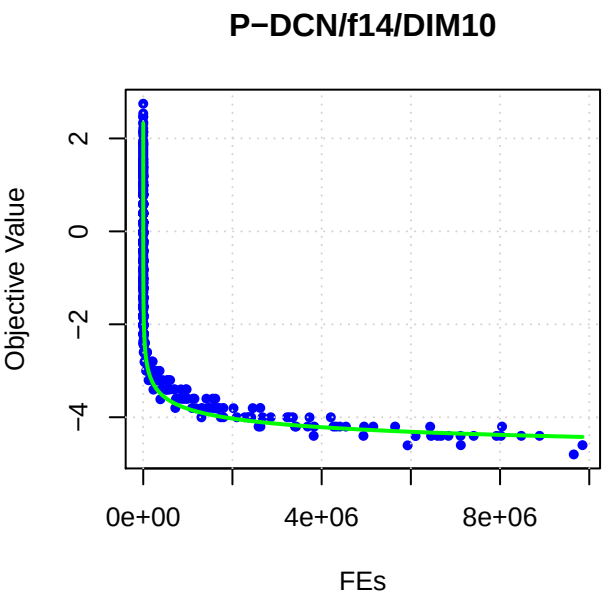
2
3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Objective Value
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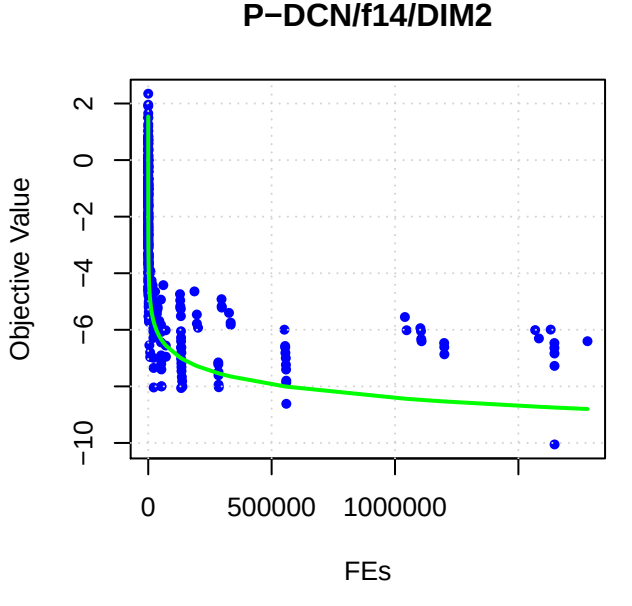
2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Objective Value
FEs
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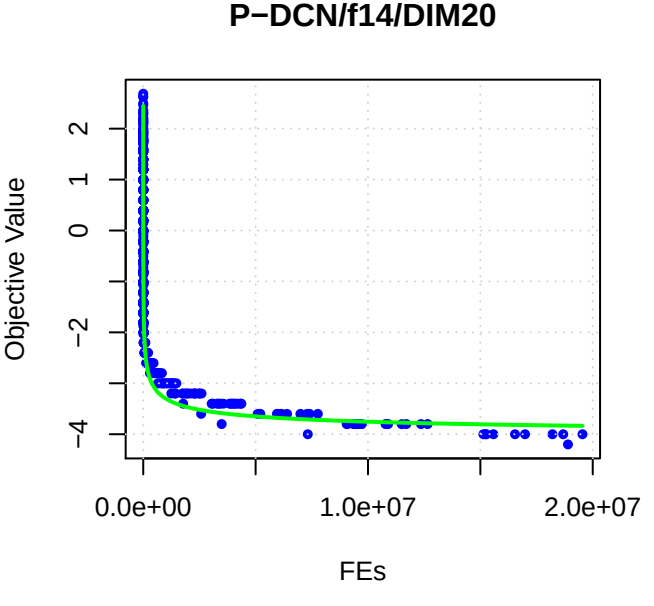
P−DCN/f14/DIM20
Objective Value
FEs
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2.0e+07
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−2
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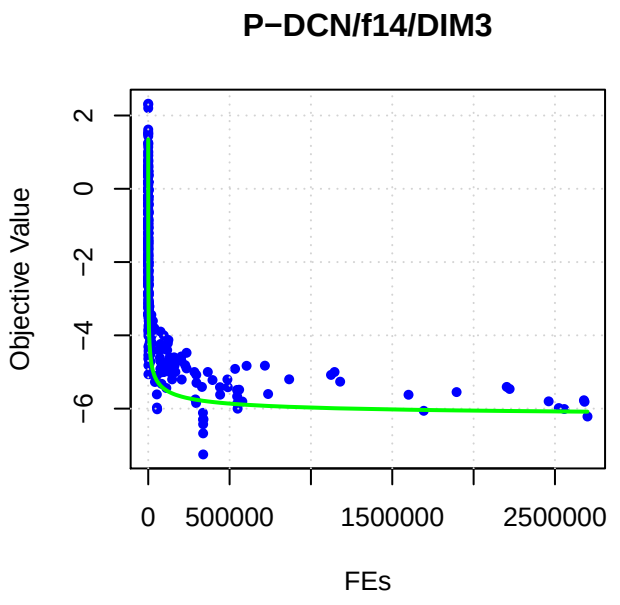
1
2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Objective Value
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−2
−4
−6
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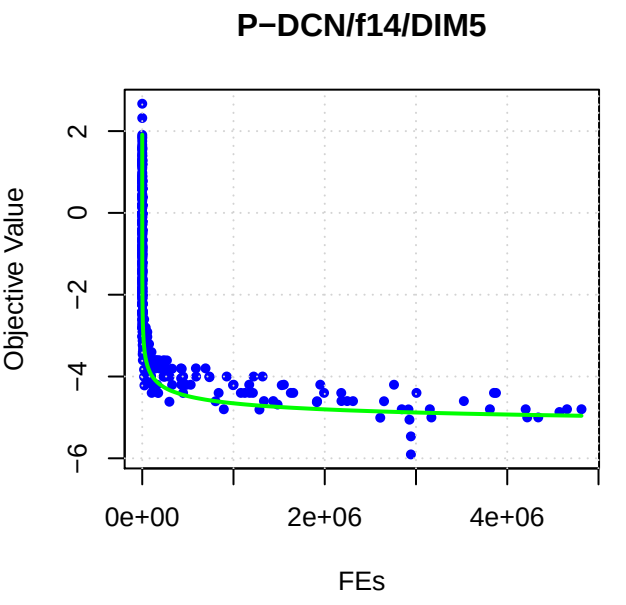
500000
1500000
2500000
FEs


P−DCN/f14/DIM5
Objective Value
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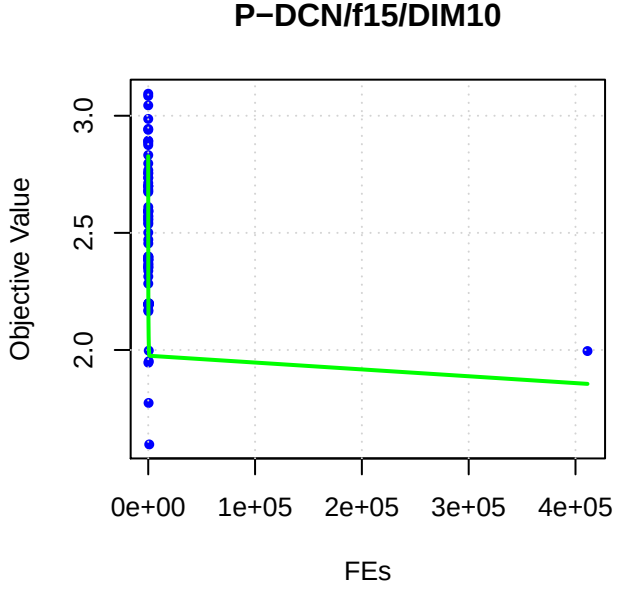
−2
−4
−6
0e+00
2e+06
4e+06
FEs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Objective Value
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2.5
2.0
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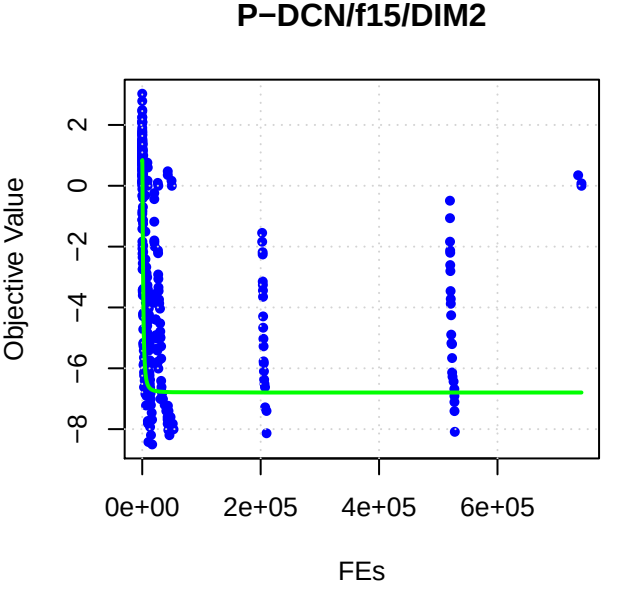
1e+05
2e+05
3e+05
4e+05
FEs


P−DCN/f15/DIM2
Objective Value
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−2
−4
−6
−8
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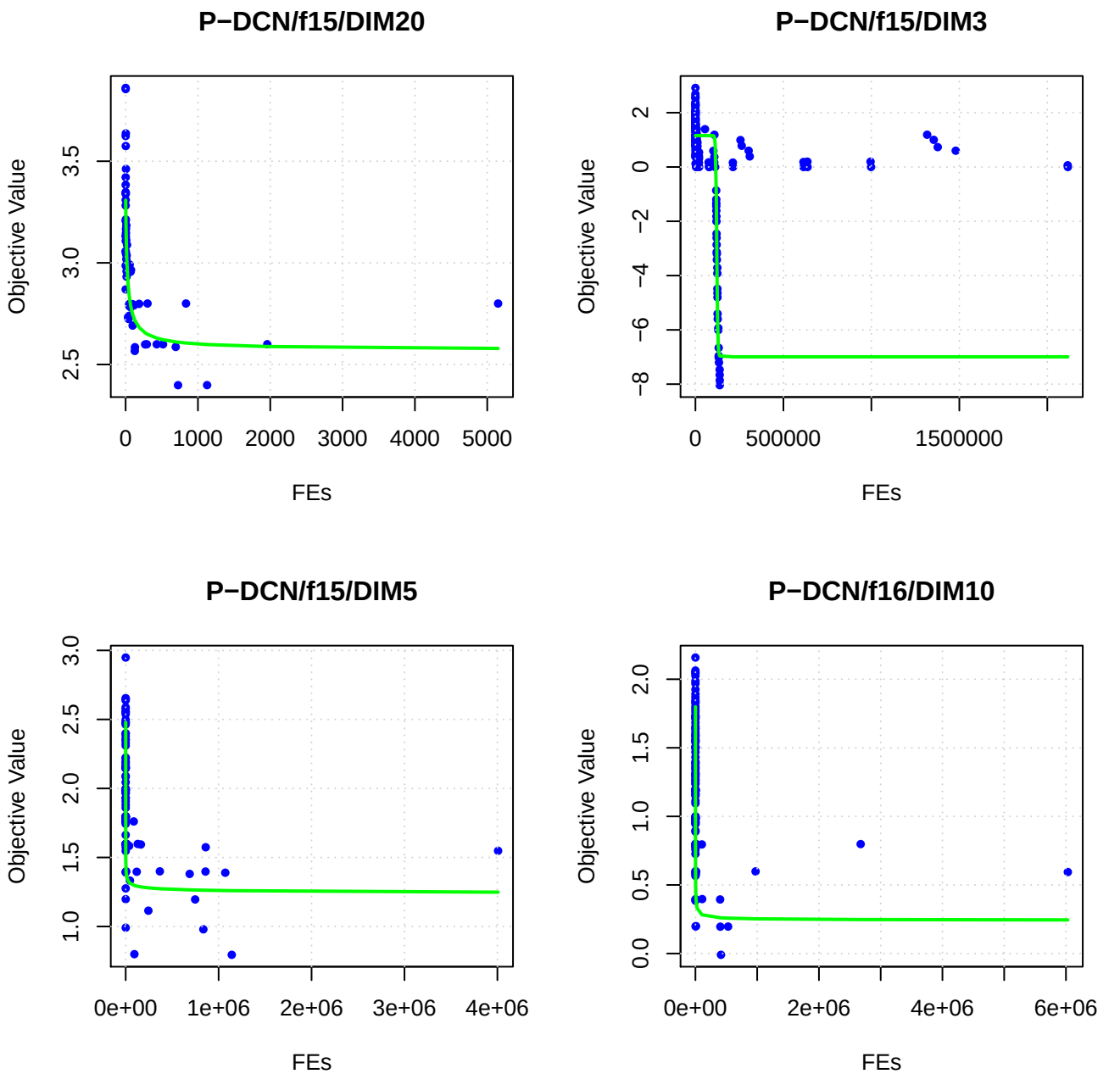
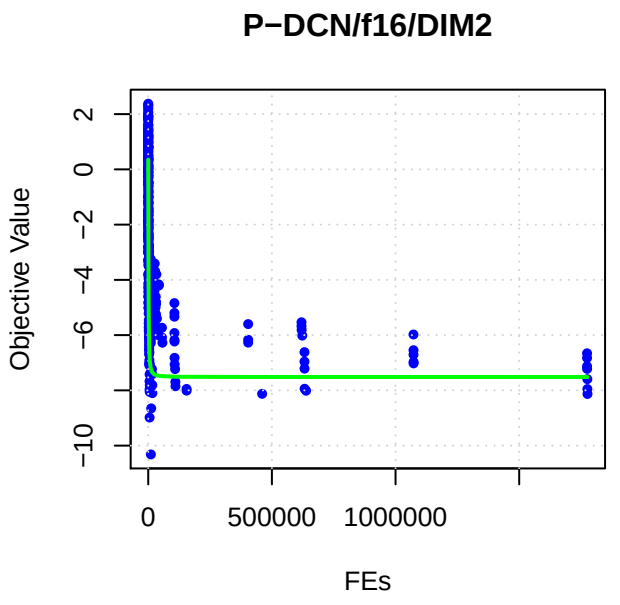
2e+05
4e+05
6e+05
FEs


P−DCN/f15/DIM20
Objective Value
FEs
P−DCN/f15/DIM3
Objective Value
FEs
P−DCN/f15/DIM5
Objective Value
FEs
P−DCN/f16/DIM10
Objective Value
FEs


P−DCN/f16/DIM2
Objective Value
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−2
−4
−6
−10
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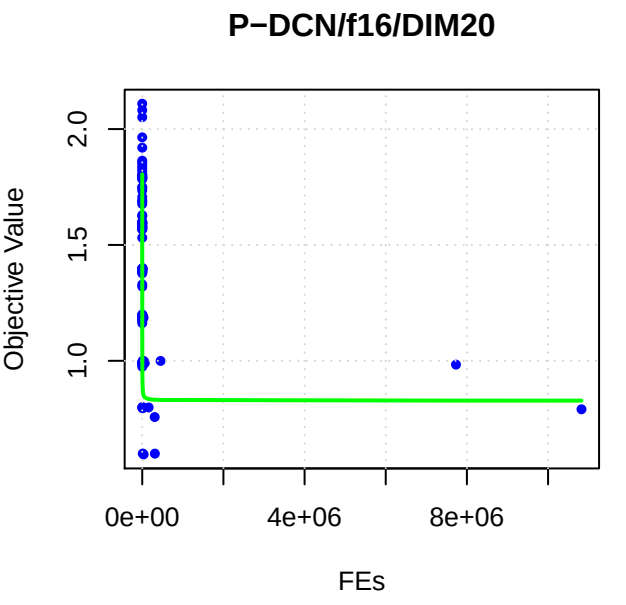
500000
1000000
FEs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Objective Value
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1.5
1.0
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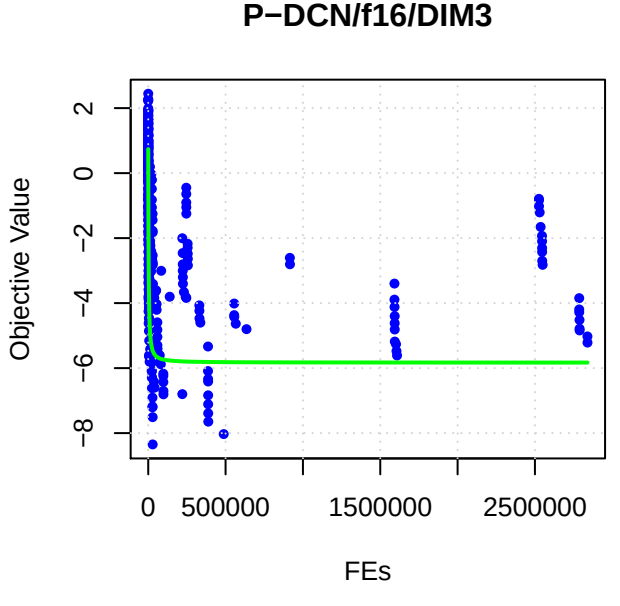
8e+06
FEs


P−DCN/f16/DIM3
Objective Value
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−2
−4
−6
−8
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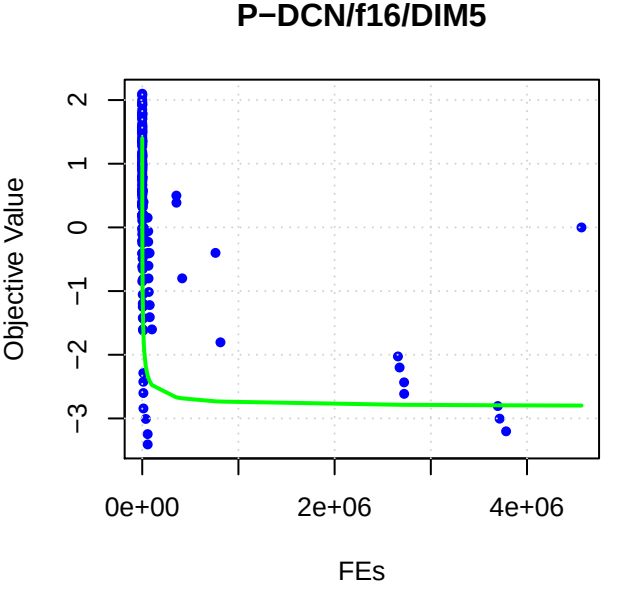
500000
1500000
2500000
FEs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Objective Value
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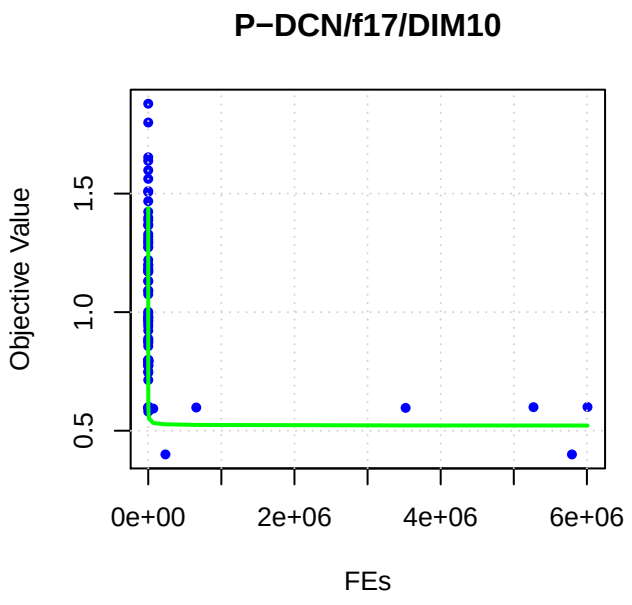
1
0
−1
−2
−3
0e+00
2e+06
4e+06
FEs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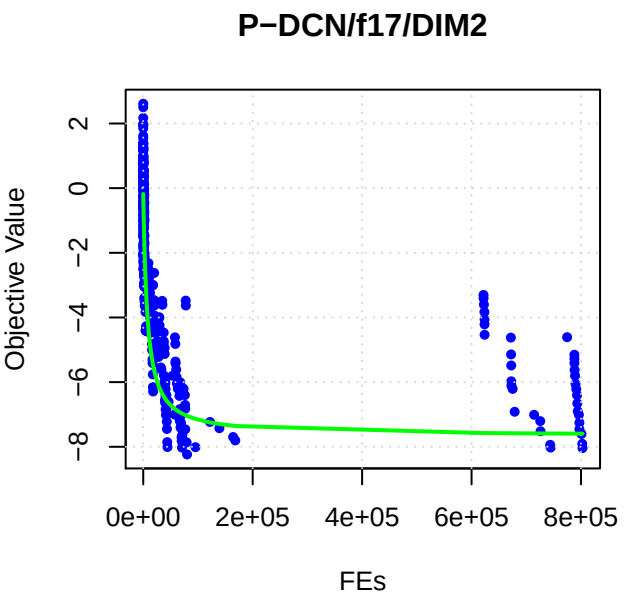
Objective Value
0.5
1.0
1.5
0e+00
2e+06
4e+06
6e+06
FEs


P−DCN/f17/DIM2
Objective Value
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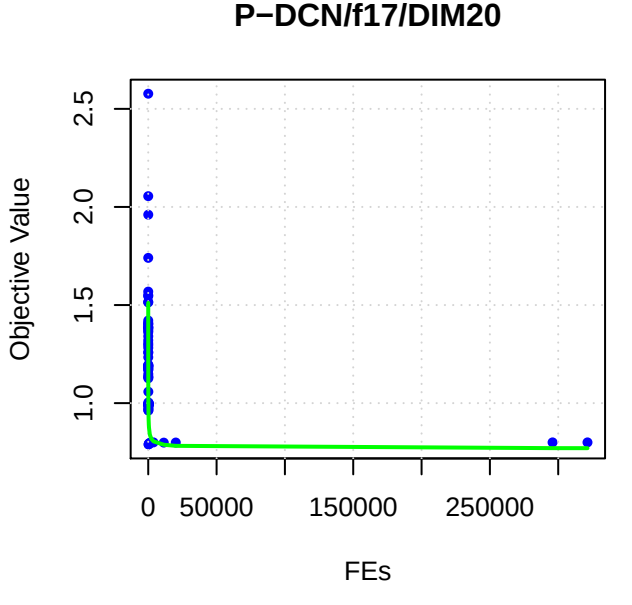
−2
−4
−6
−8
0e+00
2e+05
4e+05
6e+05
8e+05
FEs


P−DCN/f17/DIM20
Objective Value
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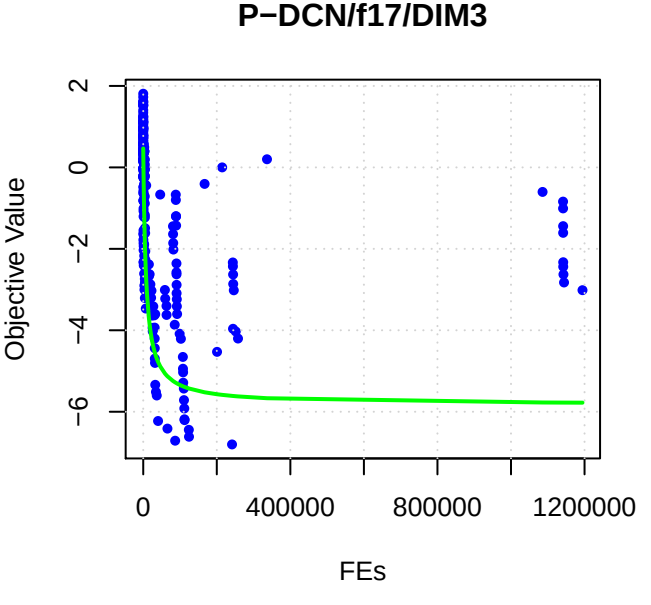
1.5
2.0
2.5
0
50000
150000
250000
FEs


P−DCN/f17/DIM3
Objective Value
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−2
−4
−6
0
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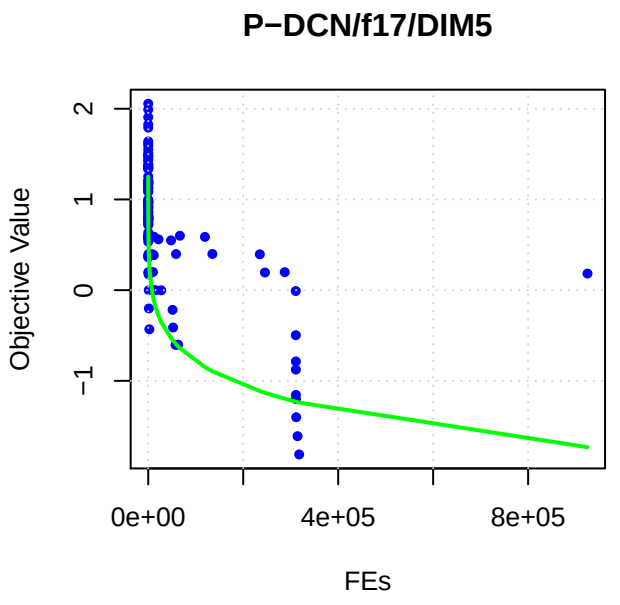
800000
1200000
FEs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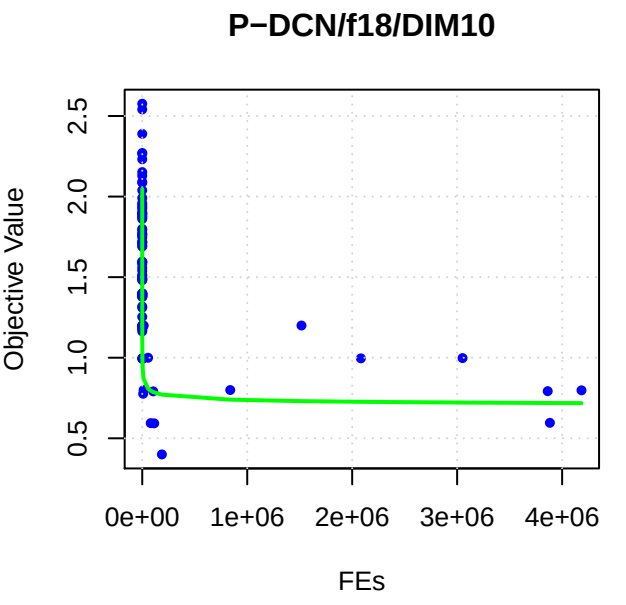
Objective Value
FEs
0e+00
4e+05
8e+05
−1
0
1
2


P−DCN/f18/DIM10
Objective Value
FEs
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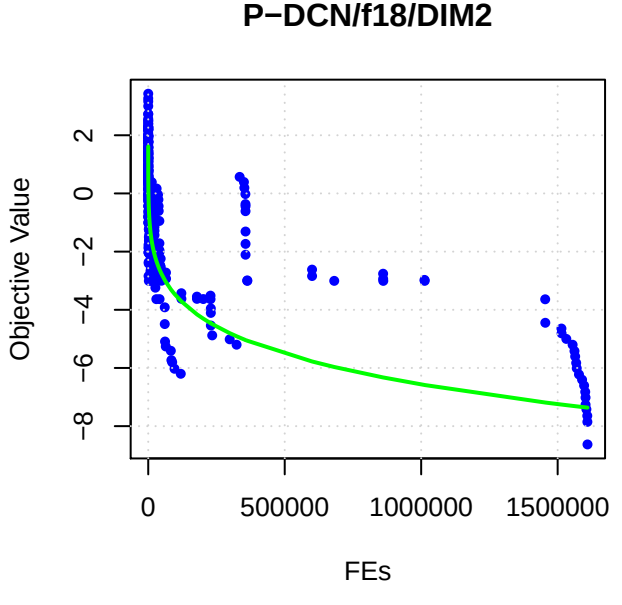
1e+06
2e+06
3e+06
4e+06
0.5
1.0
1.5
2.0
2.5


P−DCN/f18/DIM2
Objective Value
FEs
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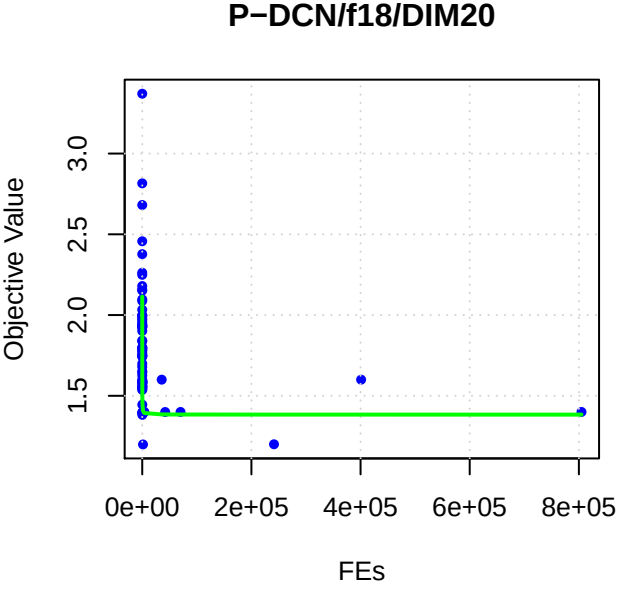
500000
1000000
1500000
−8
−6
−4
−2
0
2


P−DCN/f18/DIM20
Objective Value
FEs
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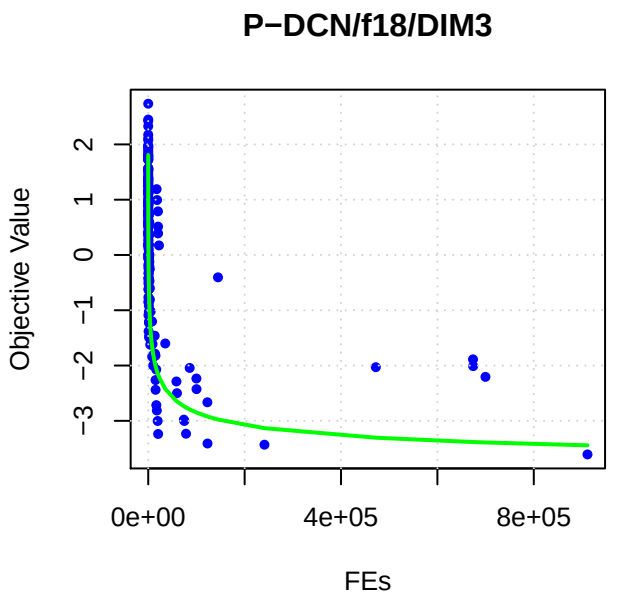
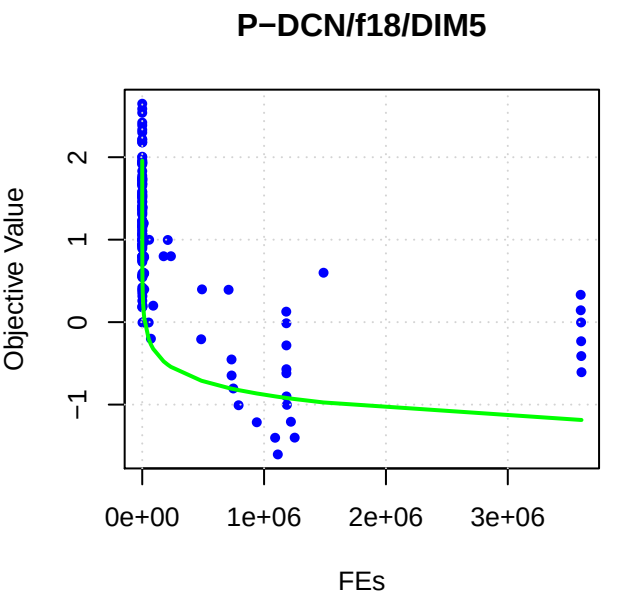
2e+05
4e+05
6e+05
8e+05
1.5
2.0
2.5
3.0


P−DCN/f18/DIM3
Objective Value
FEs
0e+00
4e+05
8e+05
2
1
0
−1
−2
−3


P−DCN/f18/DIM5
Objective Value
FEs
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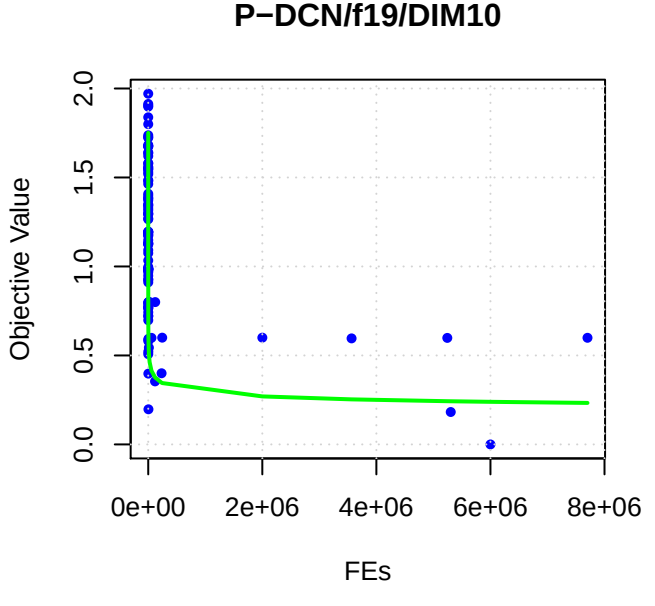
1e+06
2e+06
3e+06
2
1
0
−1


P−DCN/f19/DIM10
Objective Value
FEs
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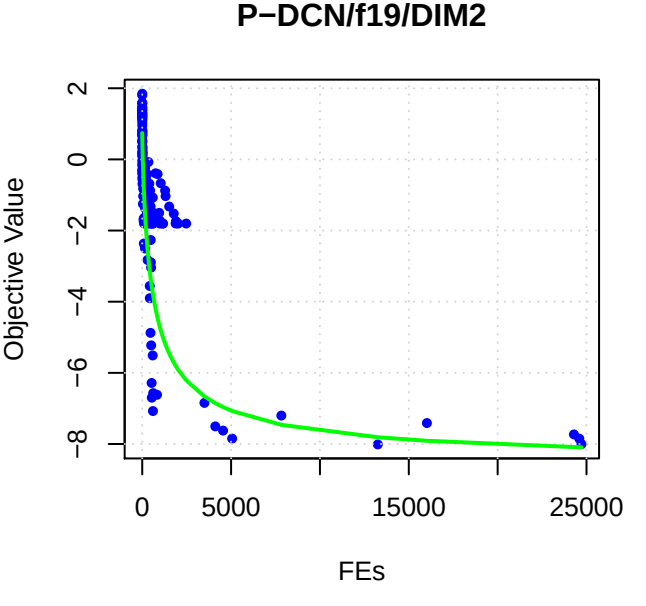
2e+06
4e+06
6e+06
8e+06
2.0
1.5
1.0
0.5
0.0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Objective Value
FEs
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5000
15000
25000
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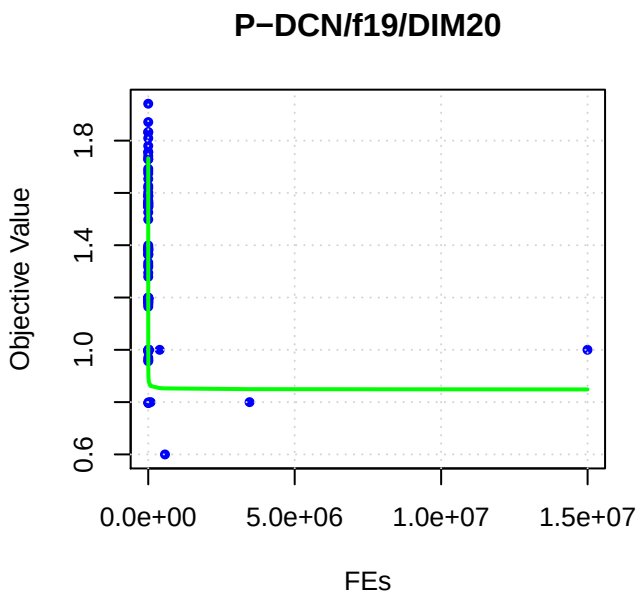
−2
−4
−6
−8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Objective Value
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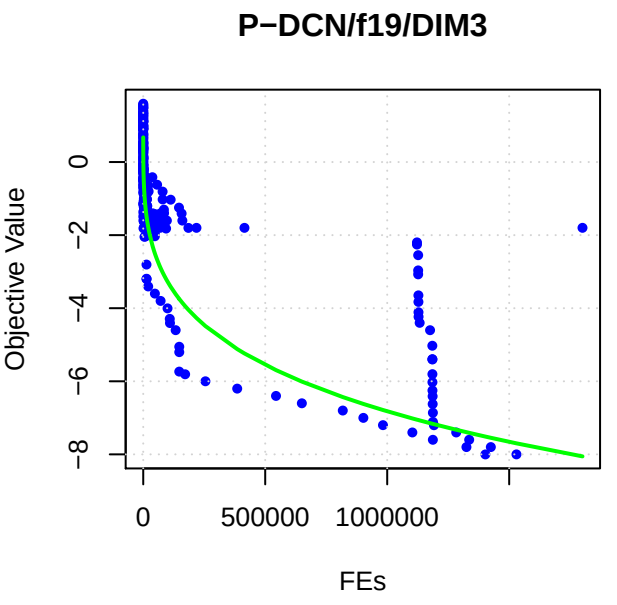
1.0
1.4
1.8
0.0e+00
5.0e+06
1.0e+07
1.5e+07
FEs


P−DCN/f19/DIM3
Objective Value
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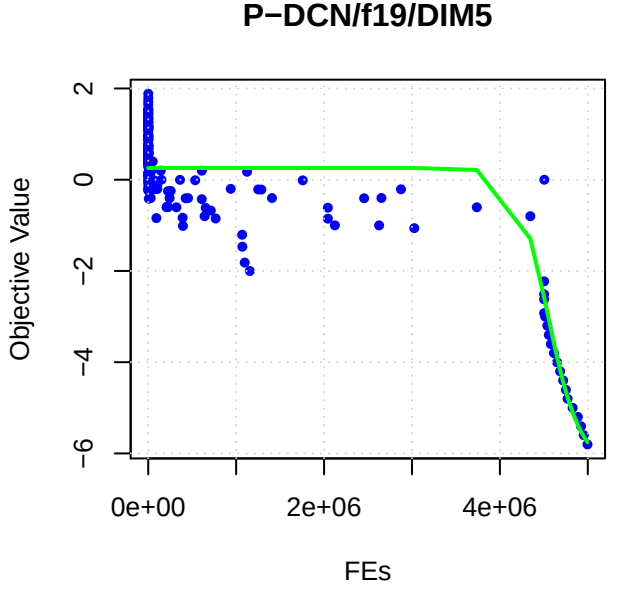
−4
−6
−8
0
500000
1000000
FEs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Objective Value
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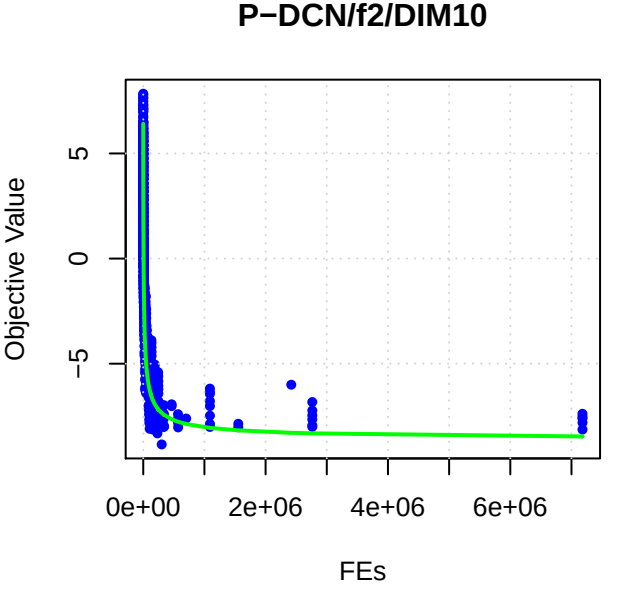
−2
−4
−6
0e+00
2e+06
4e+06
FEs


P−DCN/f2/DIM10
Objective Value
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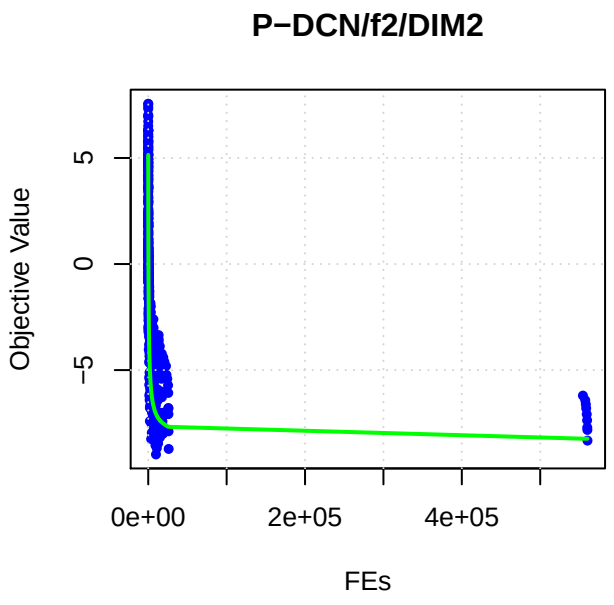
−5
0e+00
2e+06
4e+06
6e+06
FEs


P−DCN/f2/DIM2
Objective Value
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−5
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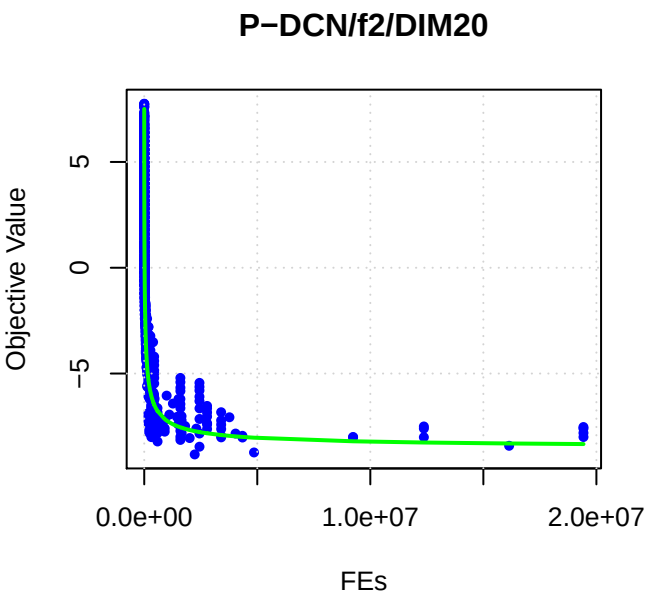
2e+05
4e+05
FEs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Objective Value
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−5
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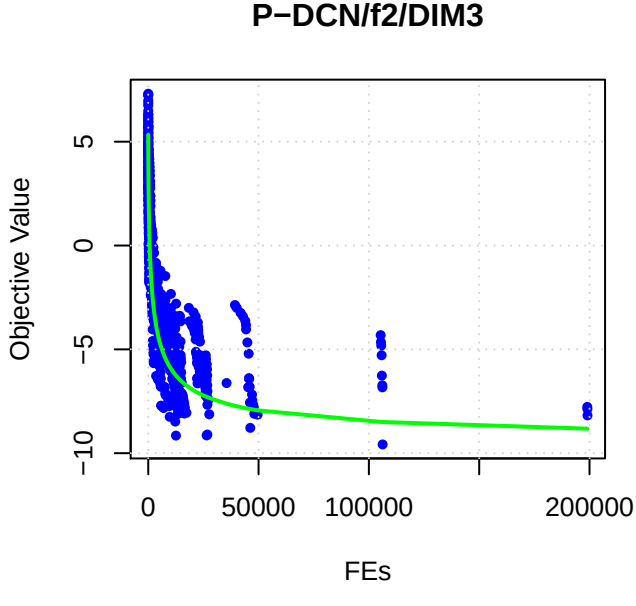
2.0e+07
FEs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Objective Value
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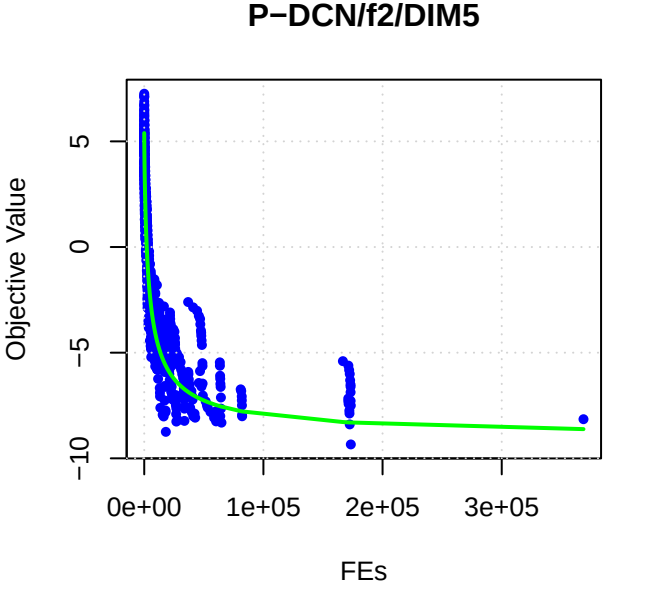
−5
−10
0
50000
100000
200000
FEs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Objective Value
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−5
−10
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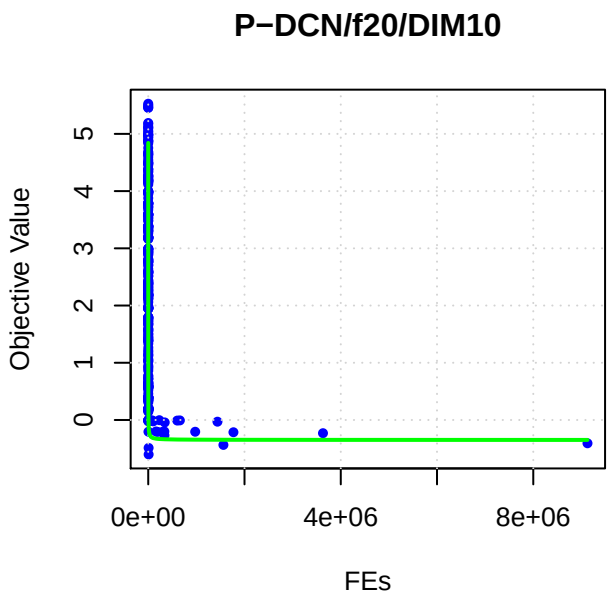
1e+05
2e+05
3e+05
FEs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Objective Value
FEs
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4e+06
8e+06
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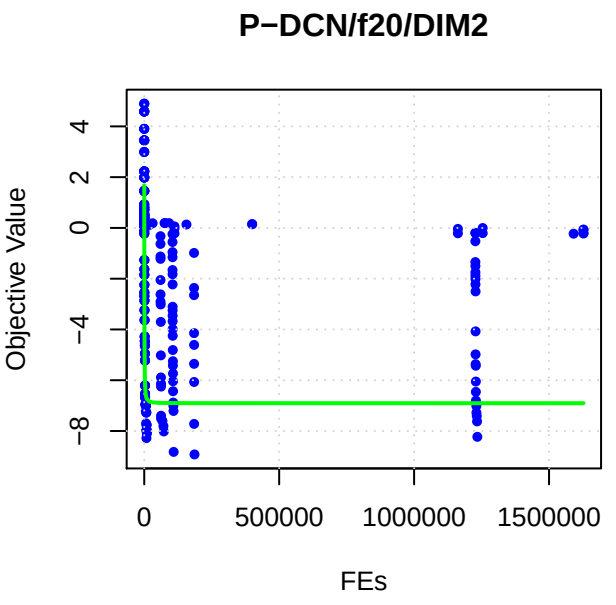
2
3
4
5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Objective Value
FEs
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1500000
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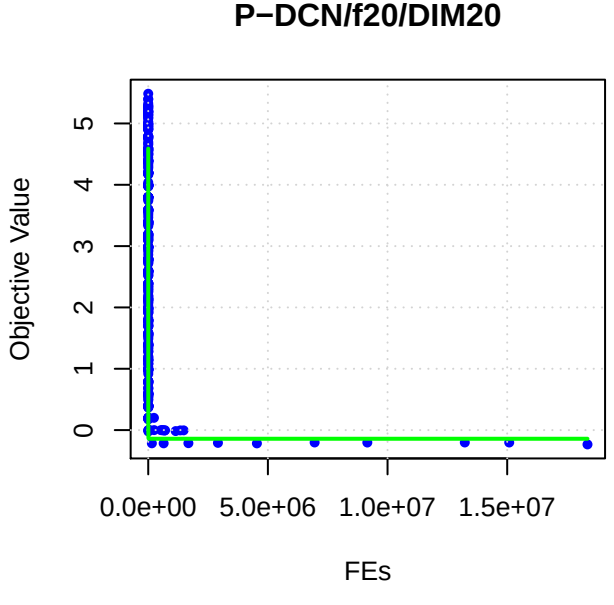
2
4


P−DCN/f20/DIM20
Objective Value
FEs
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5.0e+06
1.0e+07
1.5e+07
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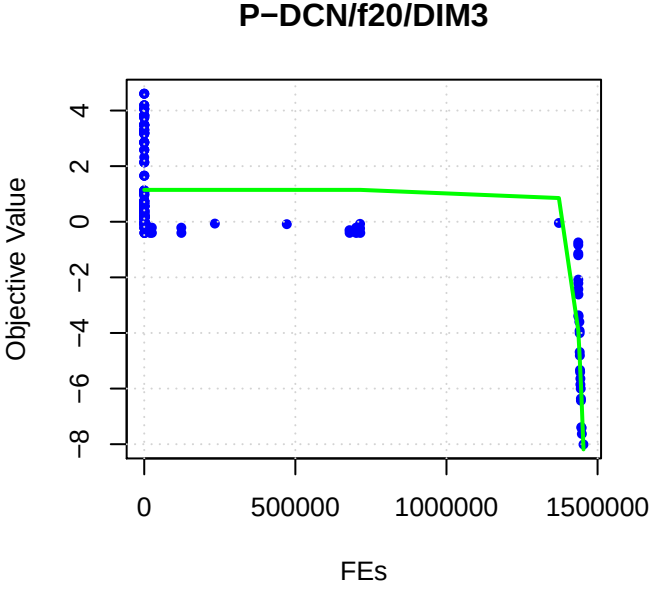
2
3
4
5


P−DCN/f20/DIM3
Objective Value
FEs
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500000
1000000
1500000
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−4
−2
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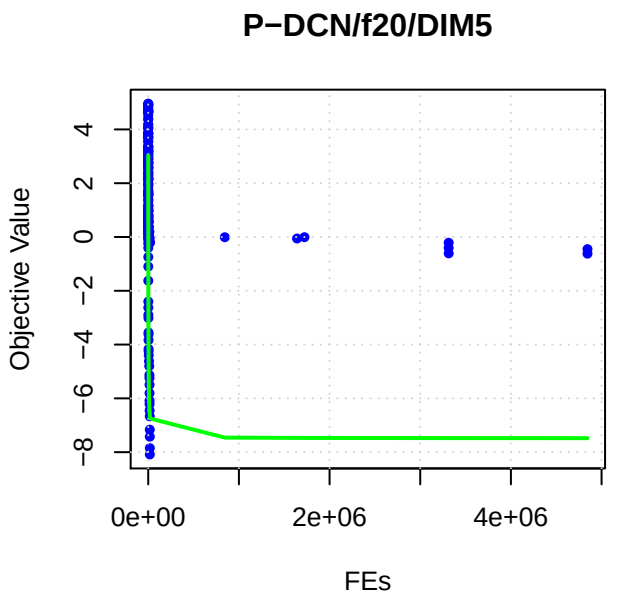
2
4


P−DCN/f20/DIM5
Objective Value
FEs
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2
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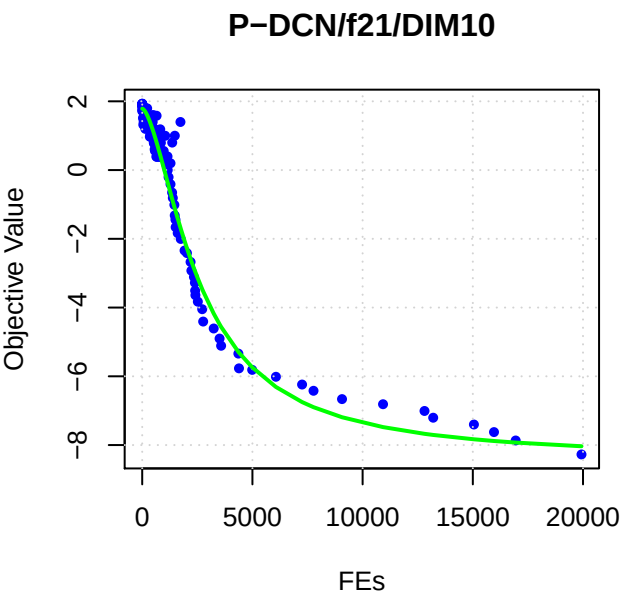
−2
−4
−6
−8
0e+00
2e+06
4e+06


P−DCN/f21/DIM10
Objective Value
FEs
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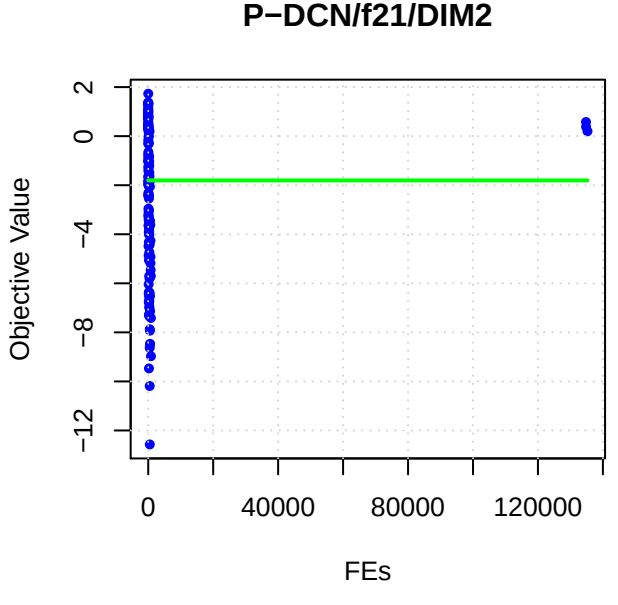
−2
−4
−6
−8
0
5000
10000
15000
20000


P−DCN/f21/DIM2
Objective Value
FEs
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−8
−12
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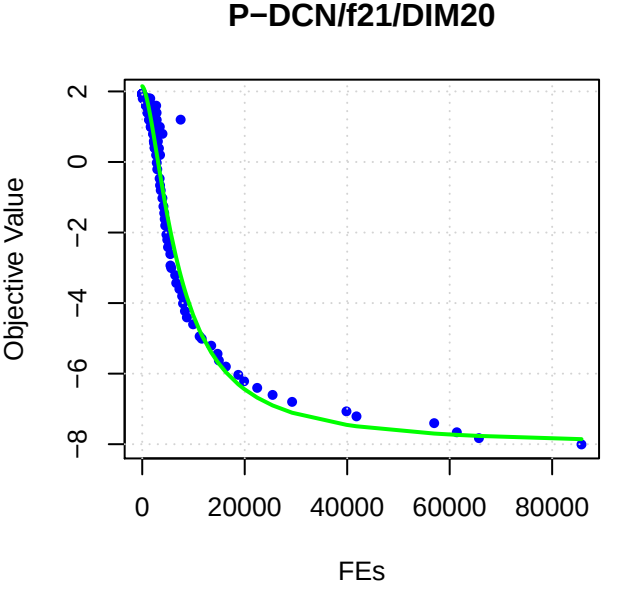
40000
80000
120000


P−DCN/f21/DIM20
Objective Value
FEs
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−6
−8
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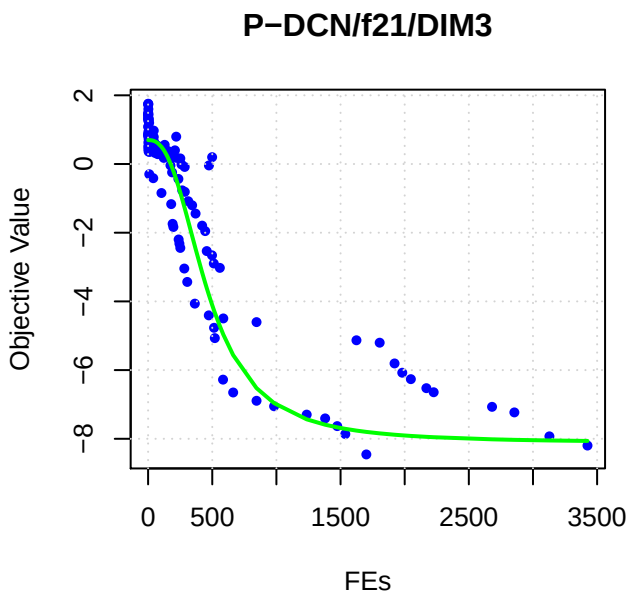
40000
60000
80000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Objective Value
FEs
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−4
−6
−8
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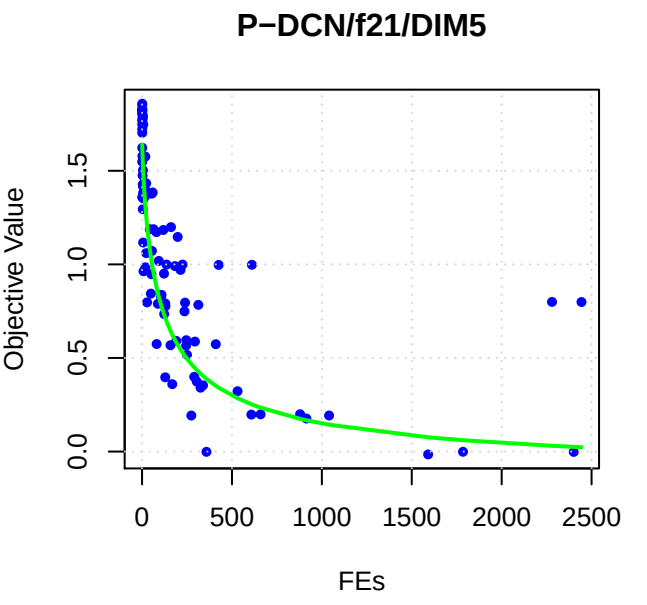
1500
2500
3500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Objective Value
FEs
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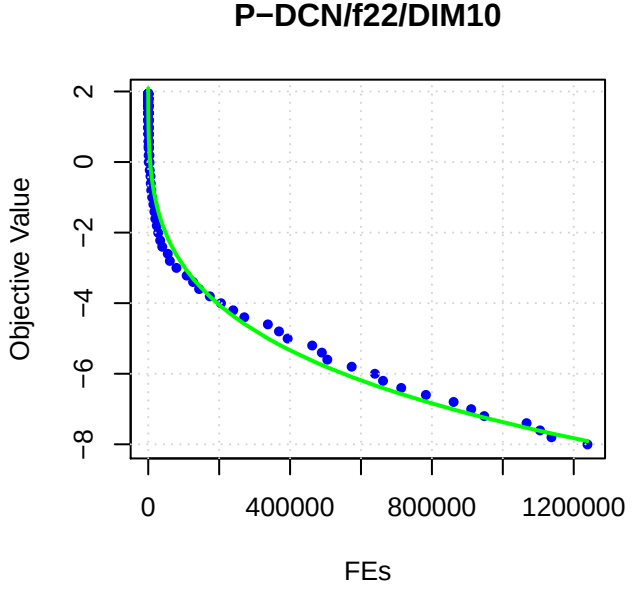
0.5
0.0
0
500
1000
1500
2000
2500


P−DCN/f22/DIM10
Objective Value
FEs
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−2
−4
−6
−8
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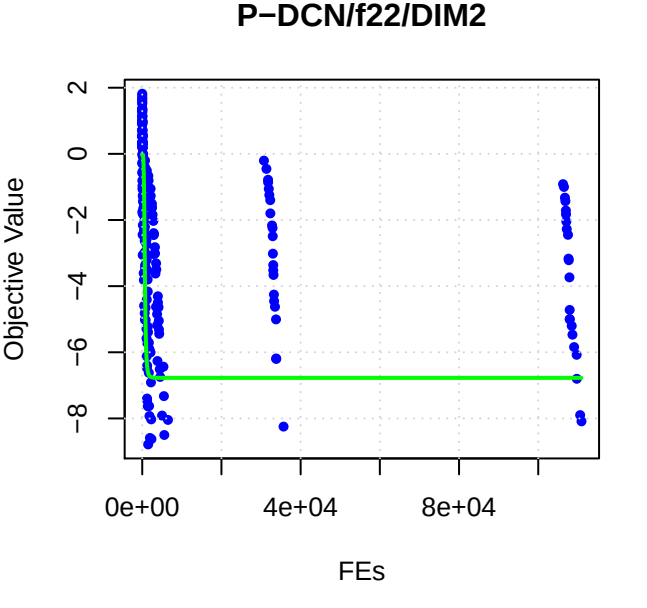
400000
800000
1200000


P−DCN/f22/DIM2
Objective Value
FEs
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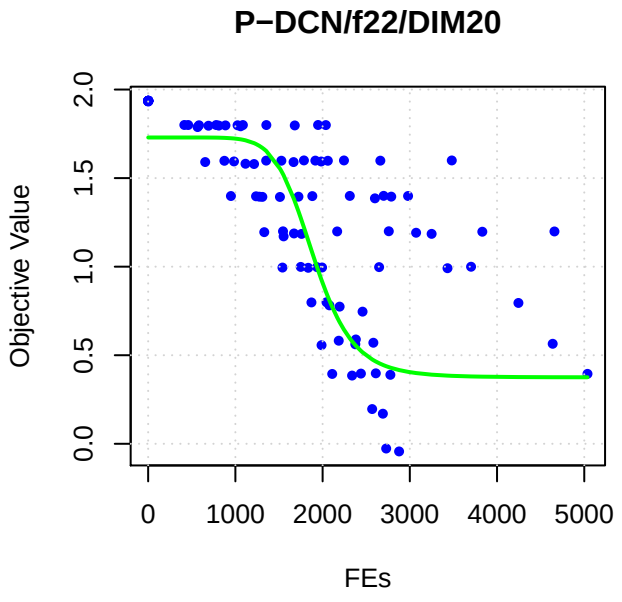
−2
−4
−6
−8
0e+00
4e+04
8e+04


P−DCN/f22/DIM20
Objective Value
FEs
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0.5
1.0
1.5
2.0
0
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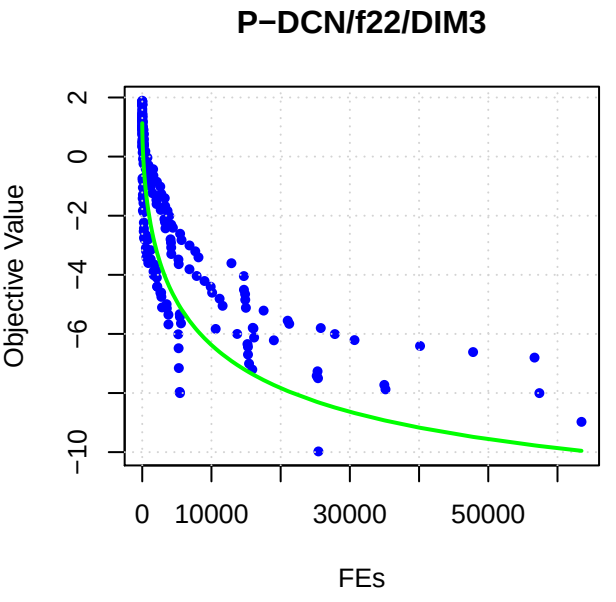
2000
3000
4000
5000


P−DCN/f22/DIM3
Objective Value
FEs
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−4
−6
−10
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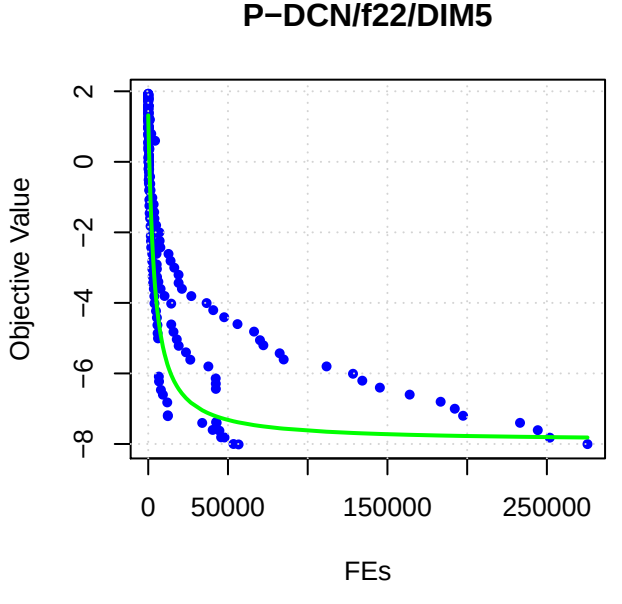
10000
30000
50000


P−DCN/f22/DIM5
Objective Value
FEs
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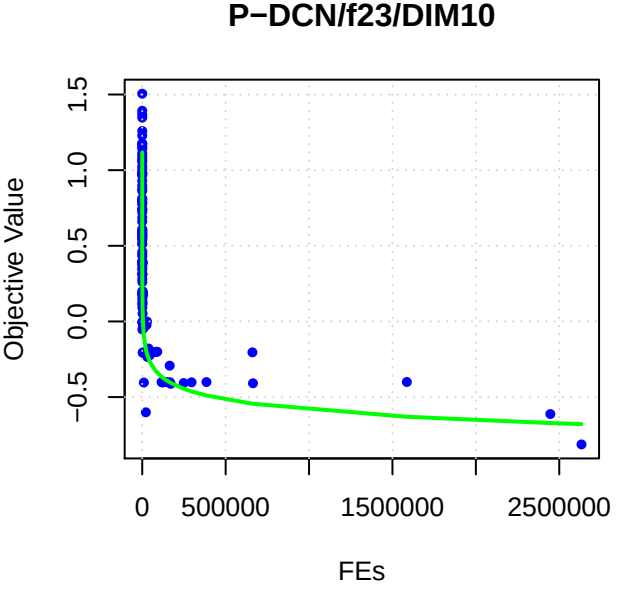
−4
−6
−8
0
50000
150000
250000


P−DCN/f23/DIM10
Objective Value
FEs
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1.0
0.5
0.0
−0.5
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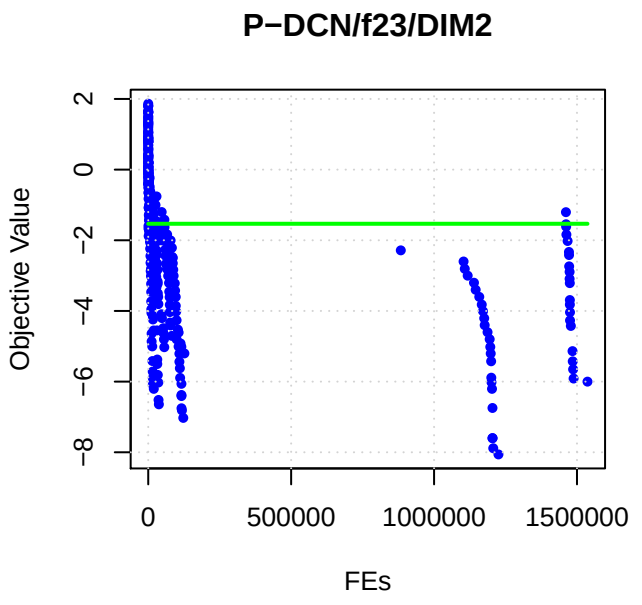
500000
1500000
2500000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Objective Value
FEs
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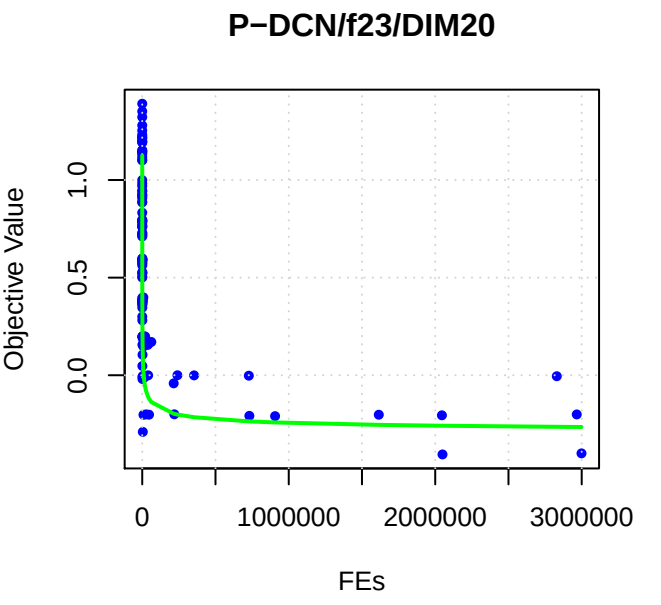
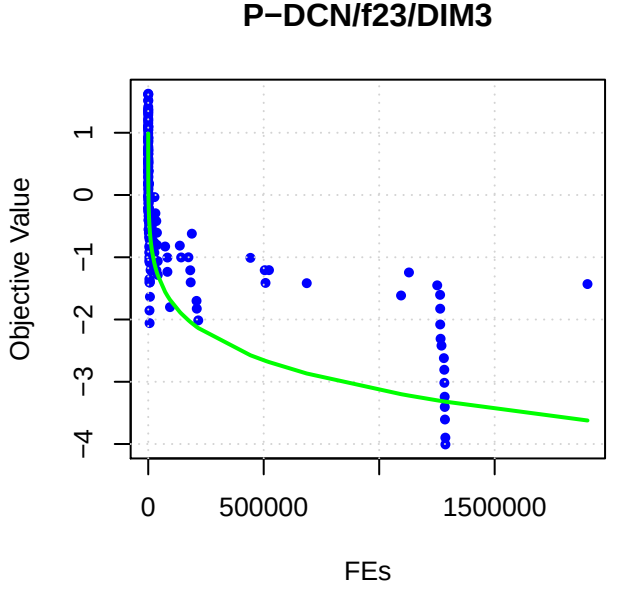
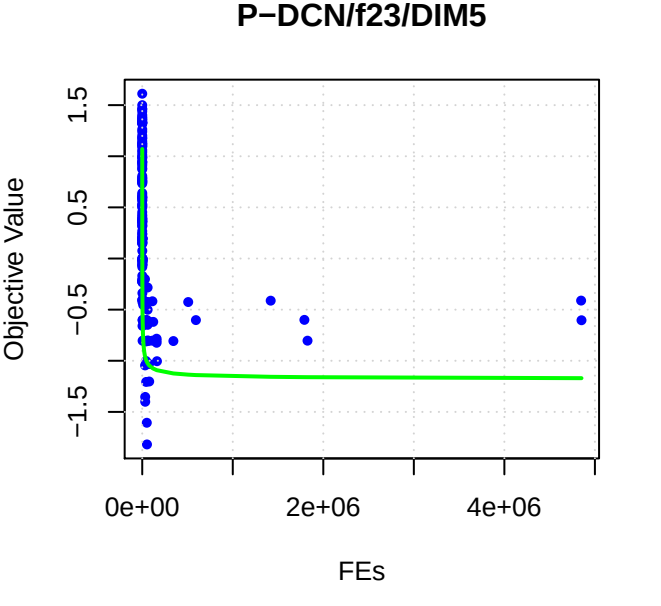
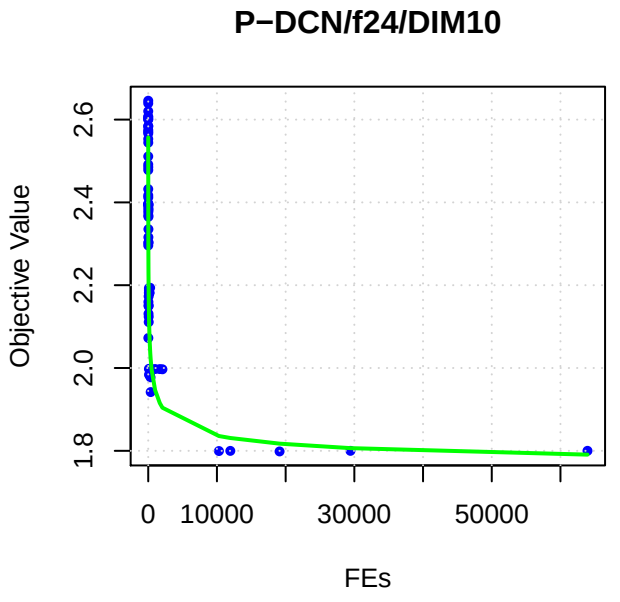
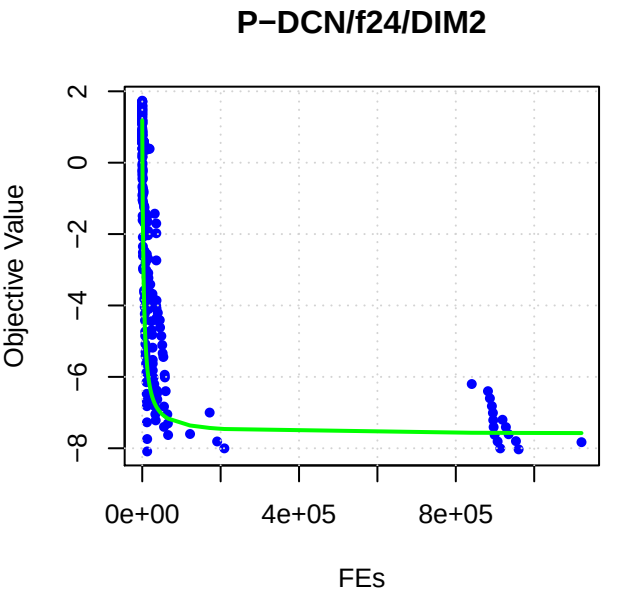
−2
−4
−6
−8
0
500000
1000000
1500000

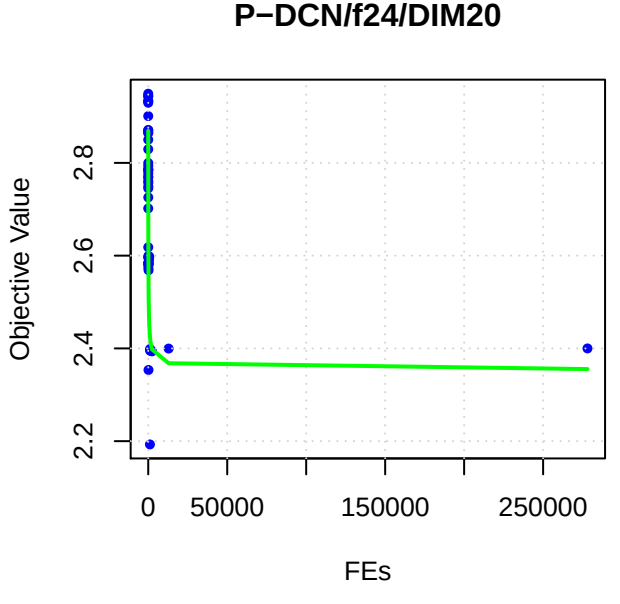

P−DCN/f23/DIM20
Objective Value
FEs
1.0
0.5
0.0
0
1000000
2000000
3000000

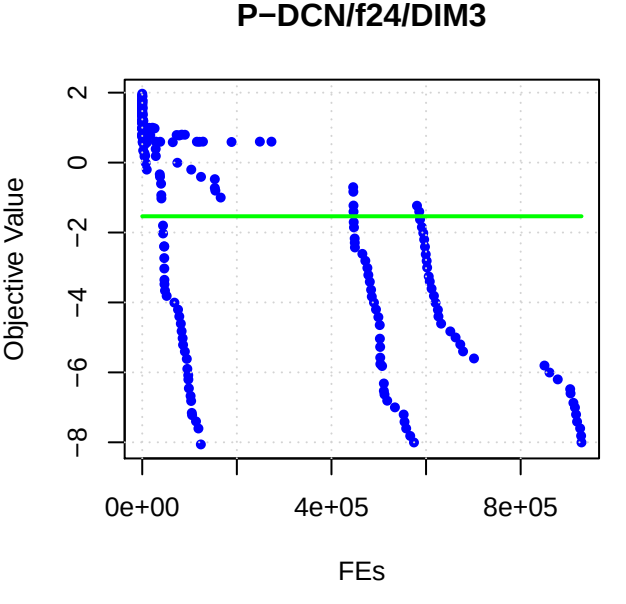

P−DCN/f23/DIM3
Objective Value
FEs
1
0
−1
−2
−3
−4
0
500000
1500000

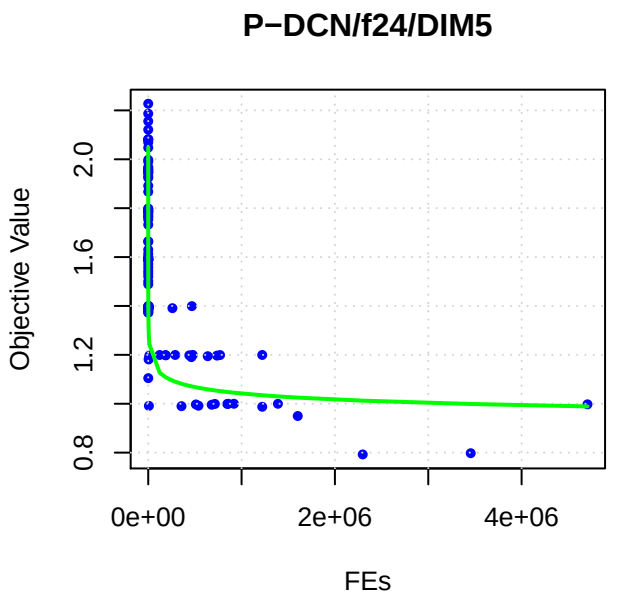

P−DCN/f23/DIM5
Objective Value
FEs
1.5
0.5
−0.5
−1.5
0e+00
2e+06
4e+06

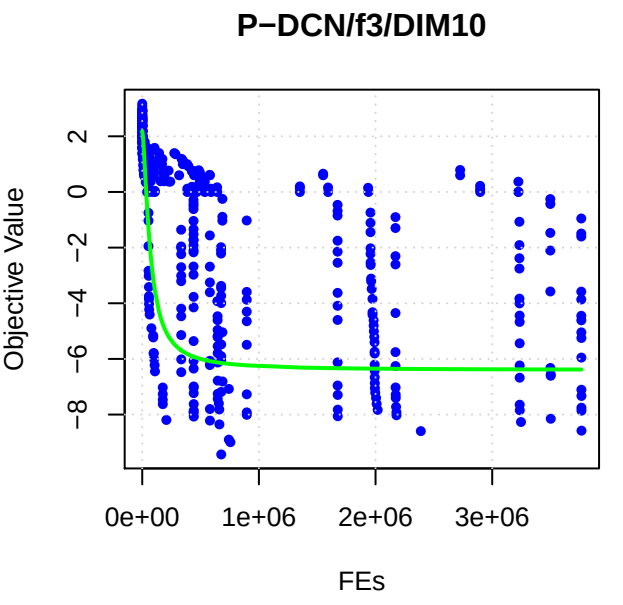

P−DCN/f24/DIM10
Objective Value
1.8
2.0
2.2
2.4
2.6
0
10000
30000
50000
FEs

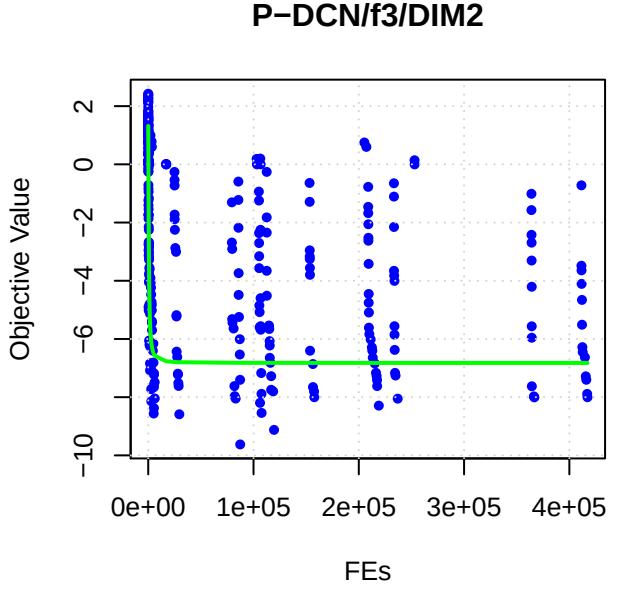

P−DCN/f24/DIM2
Objective Value
−8
−6
−4
−2
0
2
0e+00
4e+05
8e+05
FEs

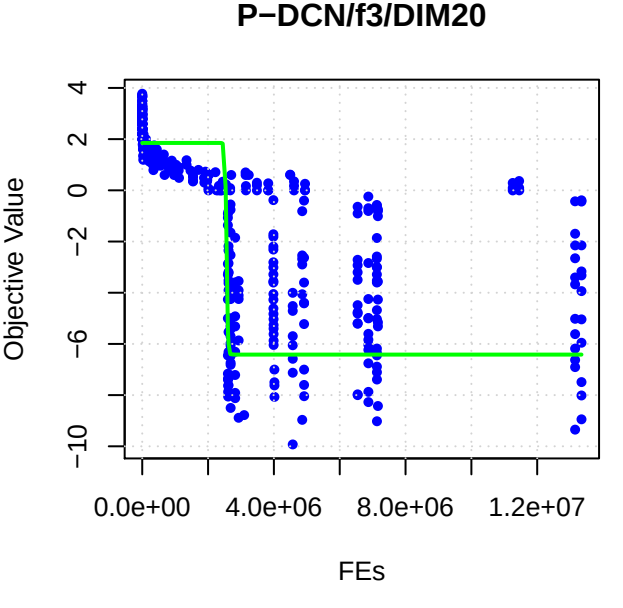

P−DCN/f24/DIM20
Objective Value
2.2
2.4
2.6
2.8
0
50000
150000
250000
FEs

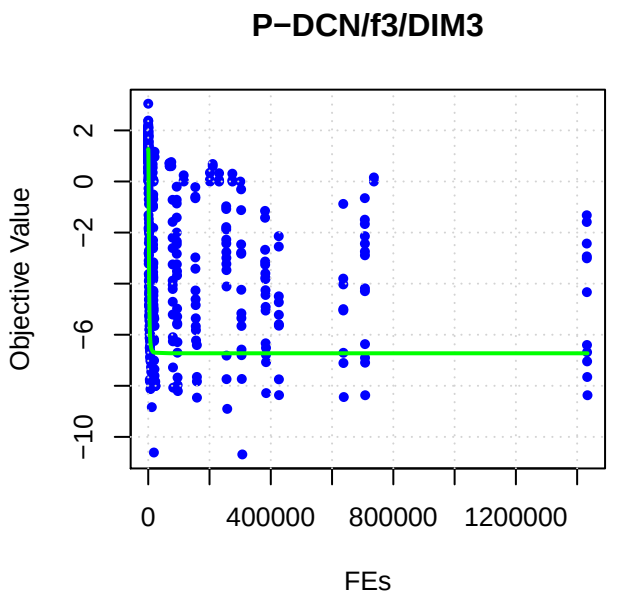

P−DCN/f24/DIM3
Objective Value
−8
−6
−4
−2
0
2
0e+00
4e+05
8e+05
FEs

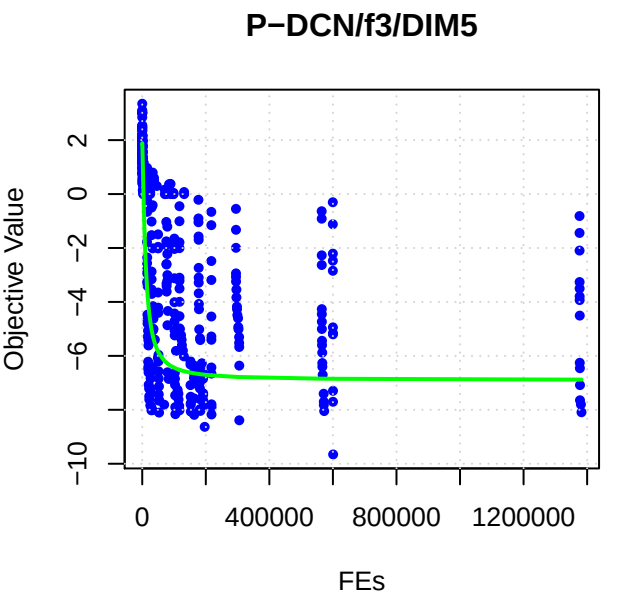

P−DCN/f24/DIM5
Objective Value
0.8
1.2
1.6
2.0
0e+00
2e+06
4e+06
FEs

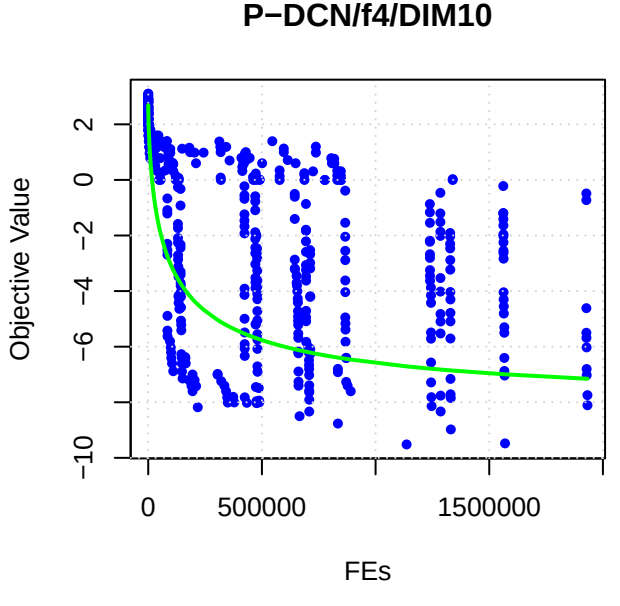

P−DCN/f3/DIM10
Objective Value
−8
−6
−4
−2
0
2
0e+00
1e+06
2e+06
3e+06
FEs

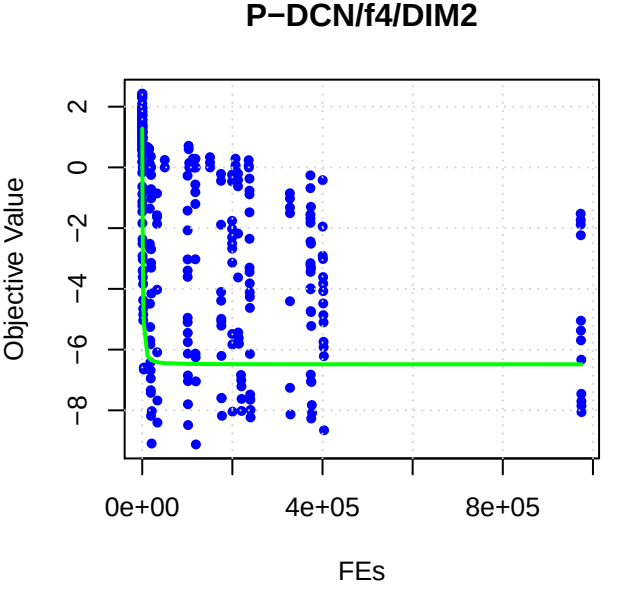

P−DCN/f3/DIM2
Objective Value
−10
−6
−4
−2
0
2
0e+00
1e+05
2e+05
3e+05
4e+05
FEs

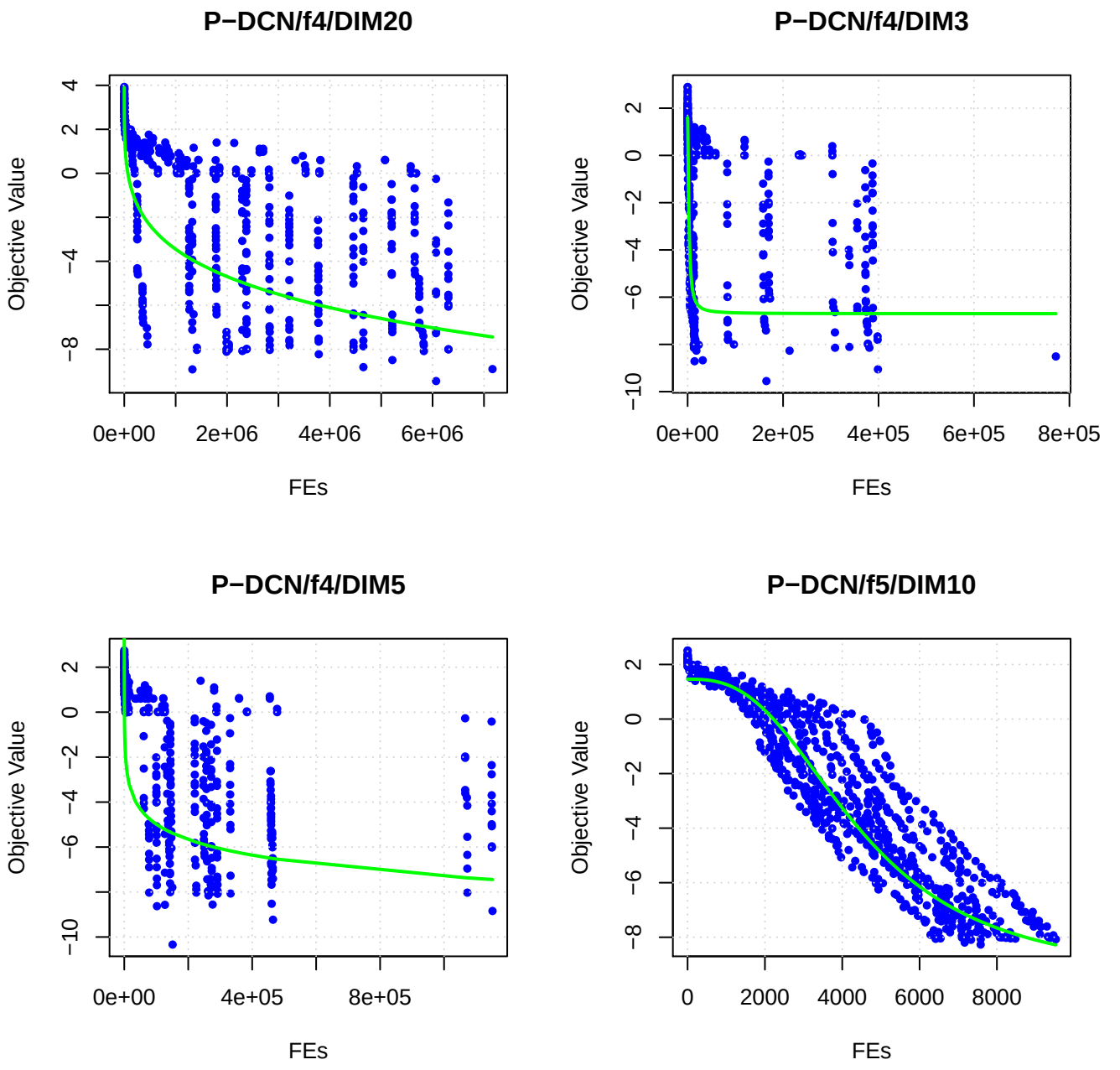

P−DCN/f3/DIM20
Objective Value
−10
−6
−2
0
2
4
0.0e+00
4.0e+06
8.0e+06
1.2e+07
FEs

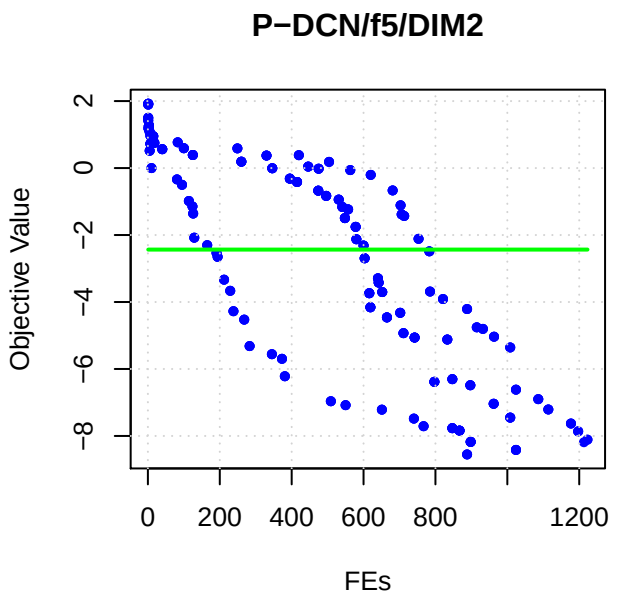

P−DCN/f3/DIM3
Objective Value
2
0
−2
−6
−10
0
400000
800000
1200000
FEs

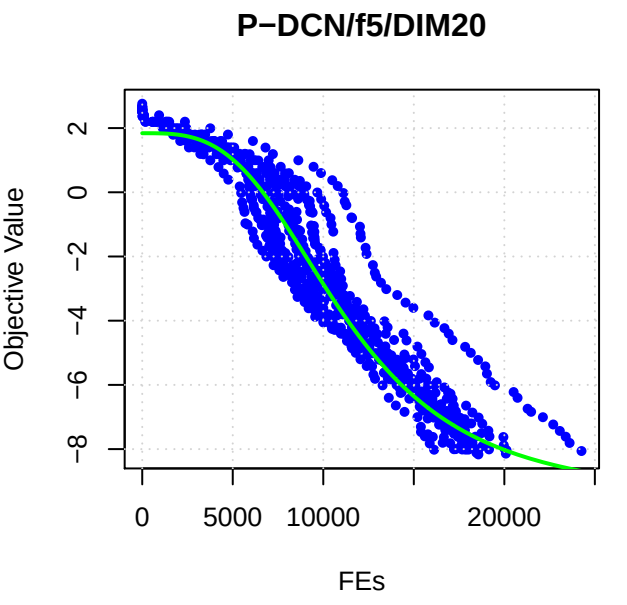

P−DCN/f3/DIM5
Objective Value
2
0
−2
−4
−6
−10
0
400000
800000
1200000
FEs

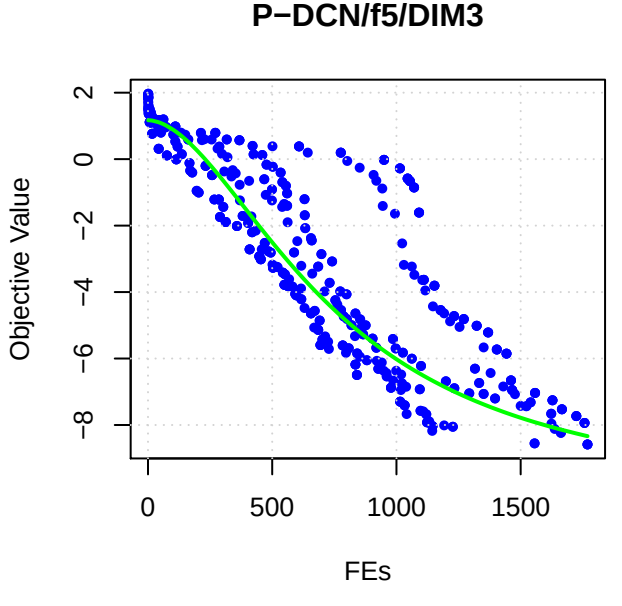

P−DCN/f4/DIM10
Objective Value
2
0
−2
−4
−6
−10
0
500000
1500000
FEs

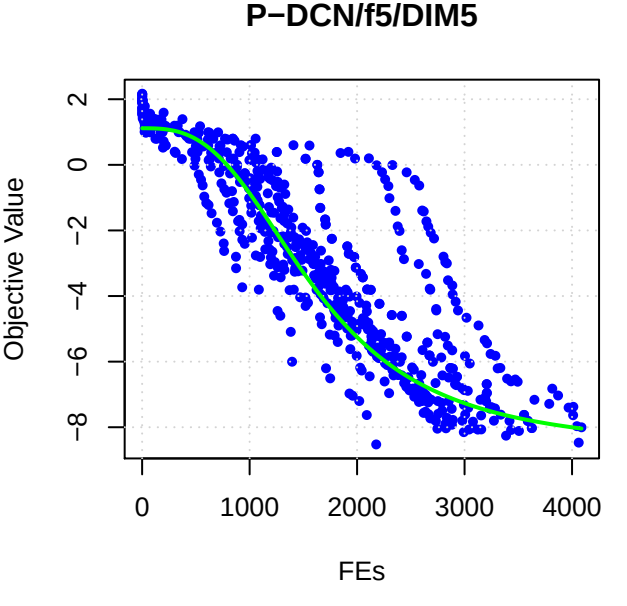

P−DCN/f4/DIM2
Objective Value
2
0
−2
−4
−6
−8
0e+00
4e+05
8e+05
FEs

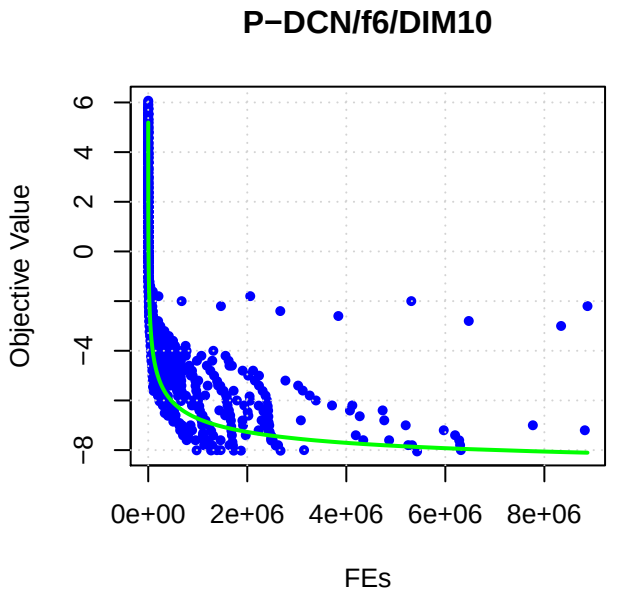

P−DCN/f4/DIM20
Objective Value
4
2
0
−4
−8
0e+00
2e+06
4e+06
6e+06
FEs
P−DCN/f4/DIM3
Objective Value
2
0
−2
−4
−6
−10
0e+00
2e+05
4e+05
6e+05
8e+05
FEs
P−DCN/f4/DIM5
Objective Value
2
0
−2
−4
−6
−10
0e+00
4e+05
8e+05
FEs
P−DCN/f5/DIM10
Objective Value
2
0
−2
−4
−6
−8
0
2000
4000
6000
8000
FEs

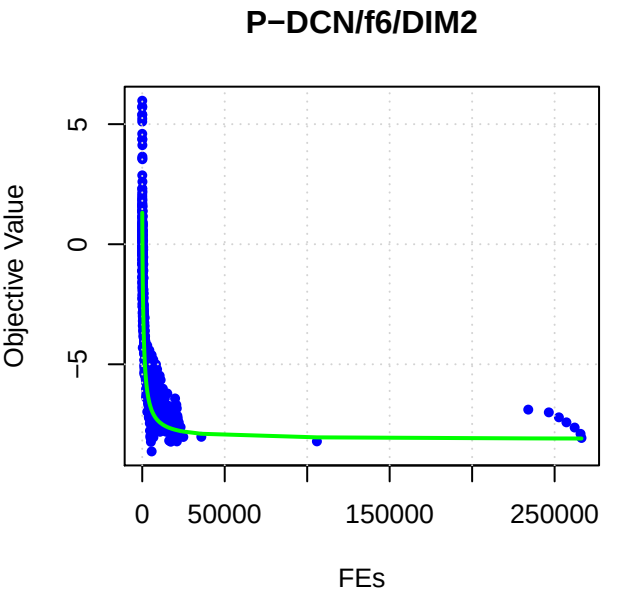

P−DCN/f5/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
200
400
600
800
1200

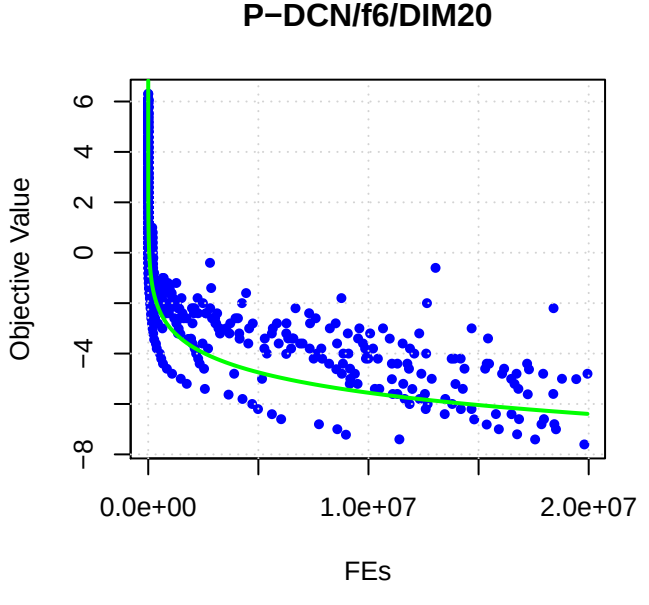

P−DCN/f5/DIM20
Objective Value
FEs
2
0
−2
−4
−6
−8
0
5000
10000
20000

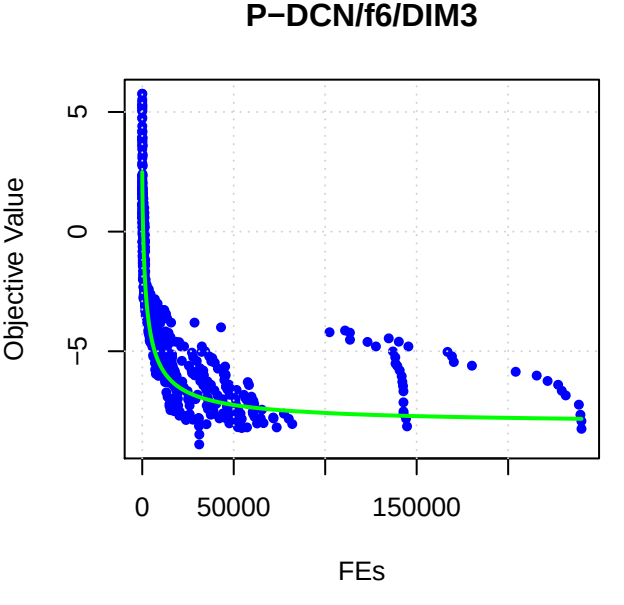

P−DCN/f5/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
500
1000
1500


P−DCN/f5/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
1000
2000
3000
4000


P−DCN/f6/DIM10
Objective Value
6
4
2
0
−4
−8
0e+00
2e+06
4e+06
6e+06
8e+06
FEs


P−DCN/f6/DIM2
Objective Value
5
0
−5
0
50000
150000
250000
FEs


P−DCN/f6/DIM20
Objective Value
6
4
2
0
−4
−8
0.0e+00
1.0e+07
2.0e+07
FEs


P−DCN/f6/DIM3
Objective Value
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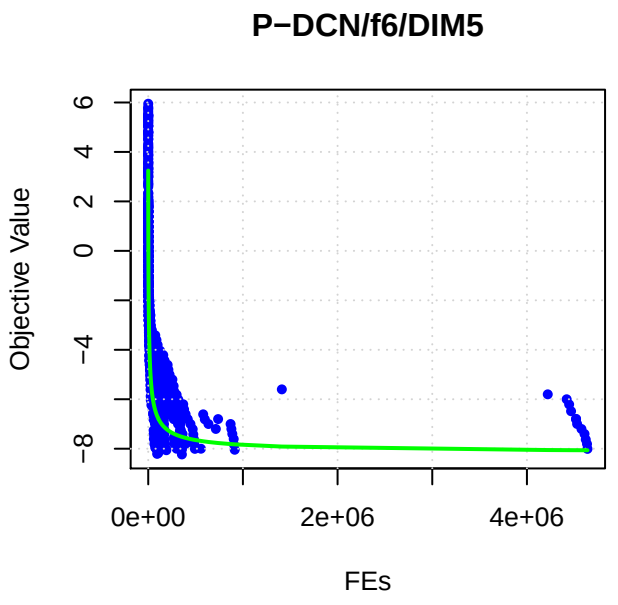
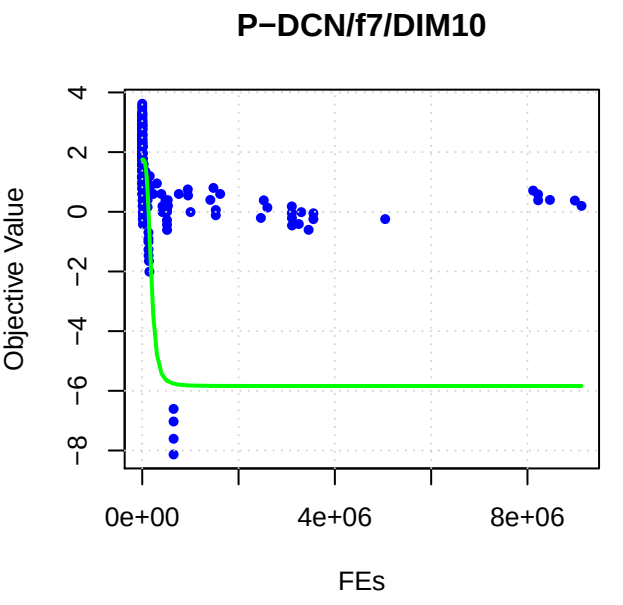
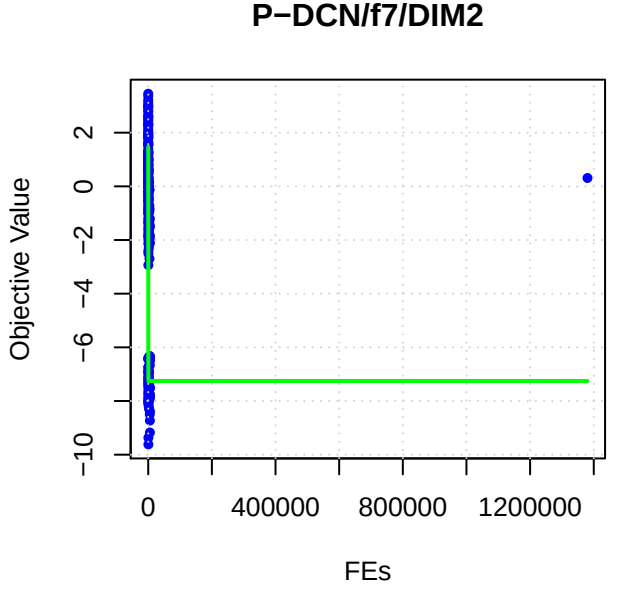
−5
0
50000
150000
FEs


P−DCN/f6/DIM5
Objective Value
FEs
6
4
2
0
−4
−8
0e+00
2e+06
4e+06


P−DCN/f7/DIM10
Objective Value
FEs
4
2
0
−2
−4
−6
−8
0e+00
4e+06
8e+06


P−DCN/f7/DIM2
Objective Value
FEs
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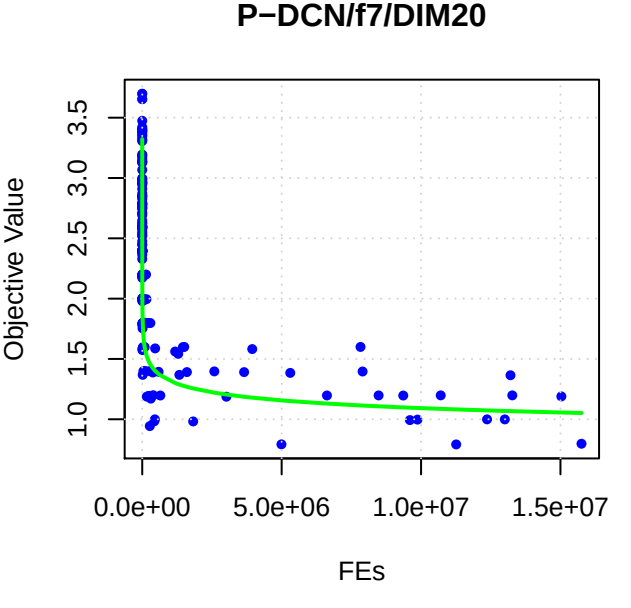
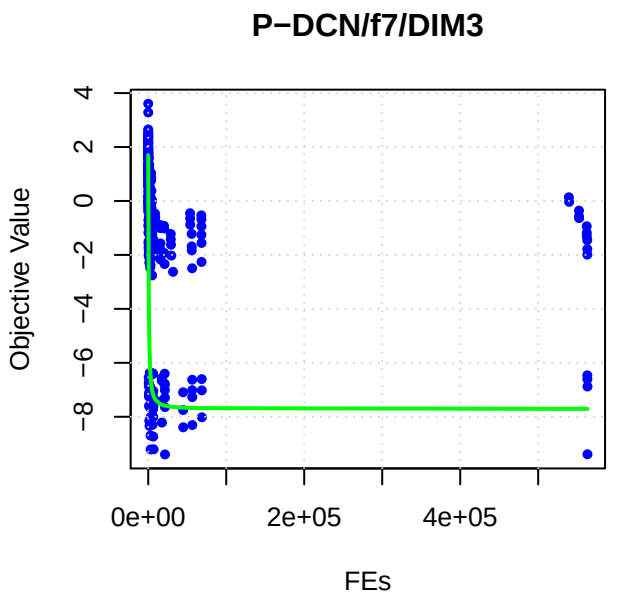
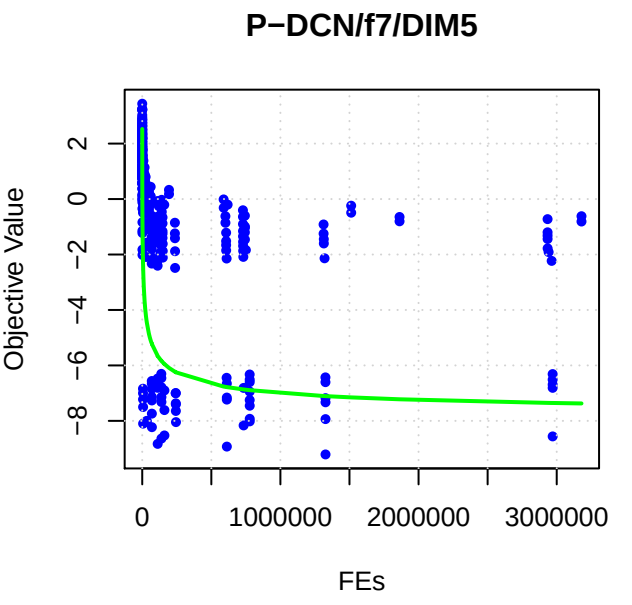
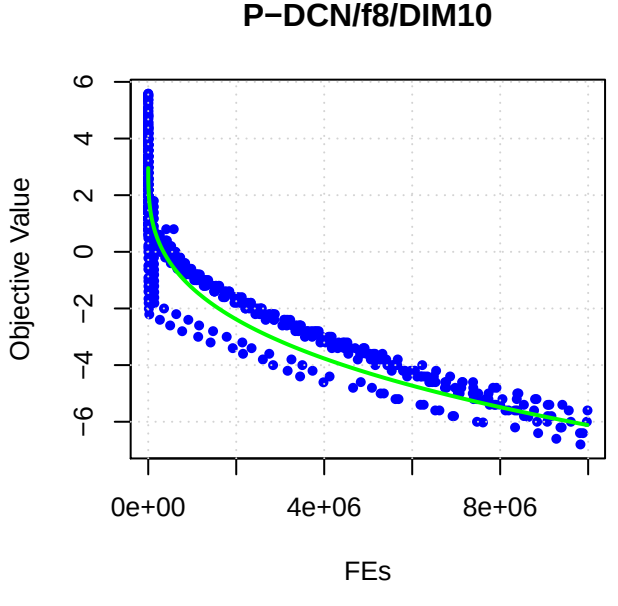
0
−2
−4
−6
−10
0
400000
800000
1200000


P−DCN/f7/DIM20
Objective Value
FEs
3.5
3.0
2.5
2.0
1.5
1.0
0.0e+00
5.0e+06
1.0e+07
1.5e+07


P−DCN/f7/DIM3
Objective Value
FEs
0e+00
2e+05
4e+05
4
2
0
−2
−4
−6
−8


P−DCN/f7/DIM5
Objective Value
FEs
0
1000000
2000000
3000000
2
0
−2
−4
−6
−8


P−DCN/f8/DIM10
Objective Value
FEs
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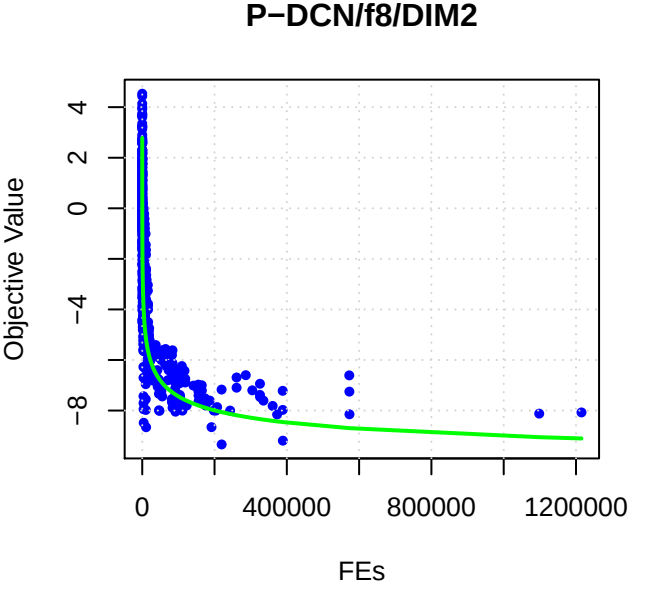
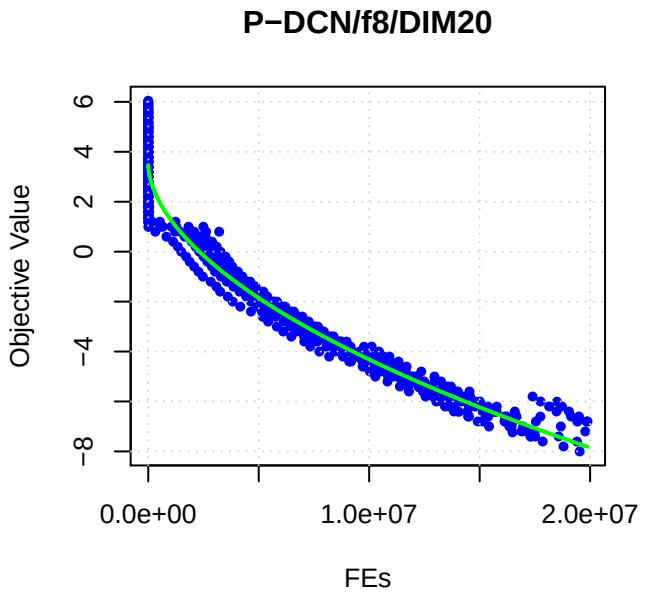
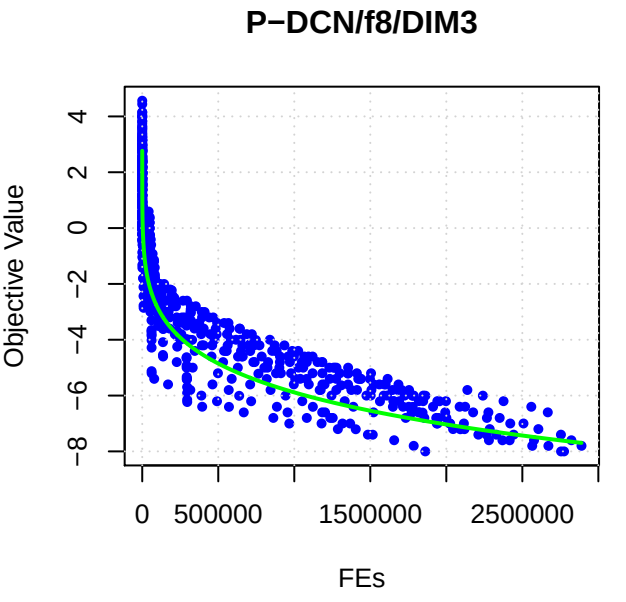
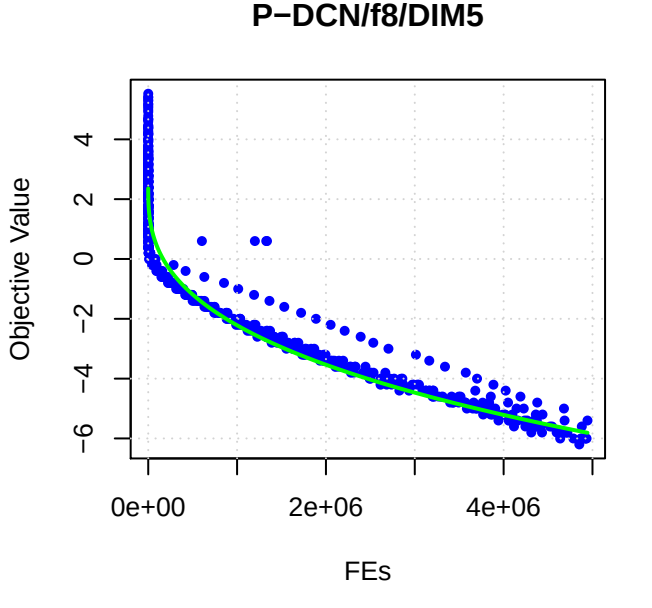
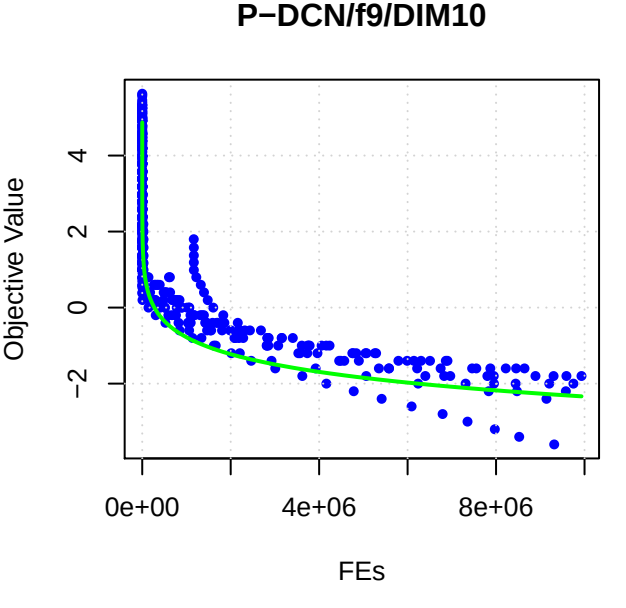
4e+06
8e+06
6
4
2
0
−2
−4
−6

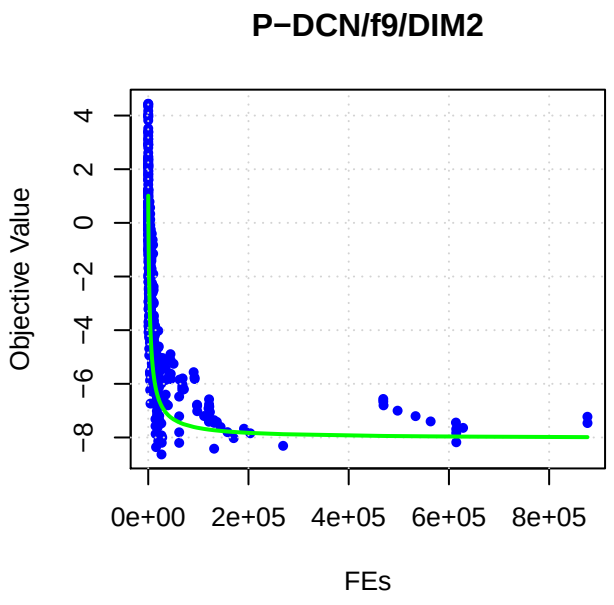

P−DCN/f8/DIM2
Objective Value
FEs
0
400000
800000
1200000
4
2
0
−4
−8

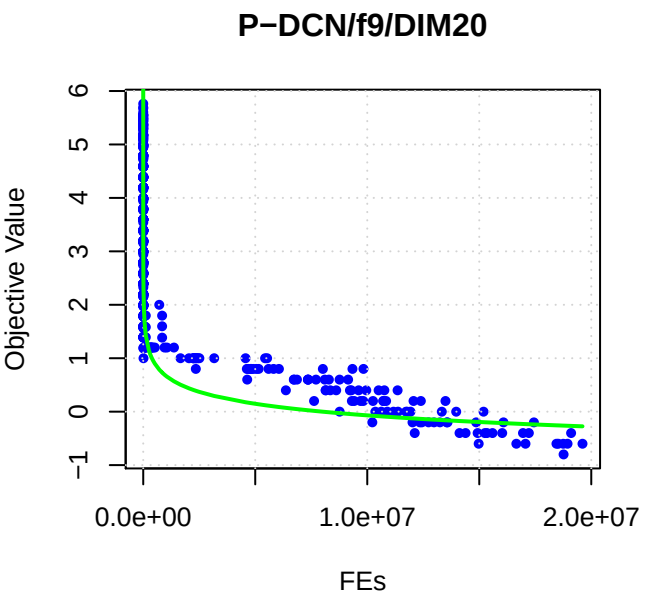

P−DCN/f8/DIM20
Objective Value
6
4
2
0
−4
−8
0.0e+00
1.0e+07
2.0e+07
FEs


P−DCN/f8/DIM3
Objective Value
4
2
0
−2
−4
−6
−8
0
500000
1500000
2500000
FEs


P−DCN/f8/DIM5
Objective Value
4
2
0
−2
−4
−6
0e+00
2e+06
4e+06
FEs


P−DCN/f9/DIM10
Objective Value
4
2
0
−2
0e+00
4e+06
8e+06
FEs


P−DCN/f9/DIM2
Objective Value
FEs
0e+00
2e+05
4e+05
6e+05
8e+05
4
2
0
−2
−4
−6
−8


P−DCN/f9/DIM20
Objective Value
FEs
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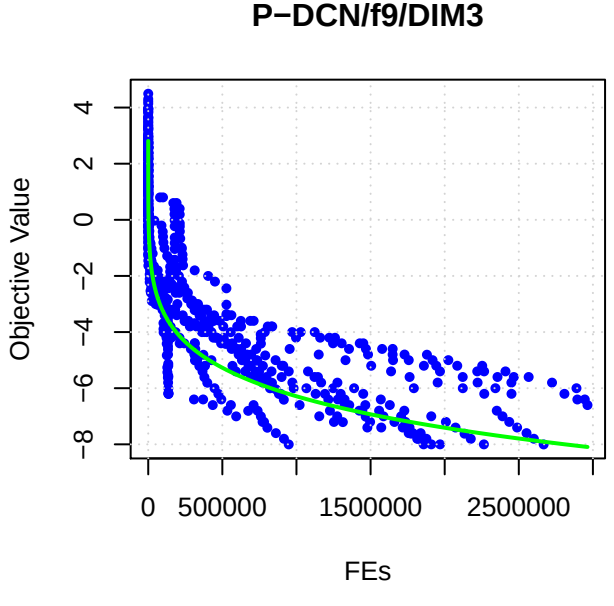
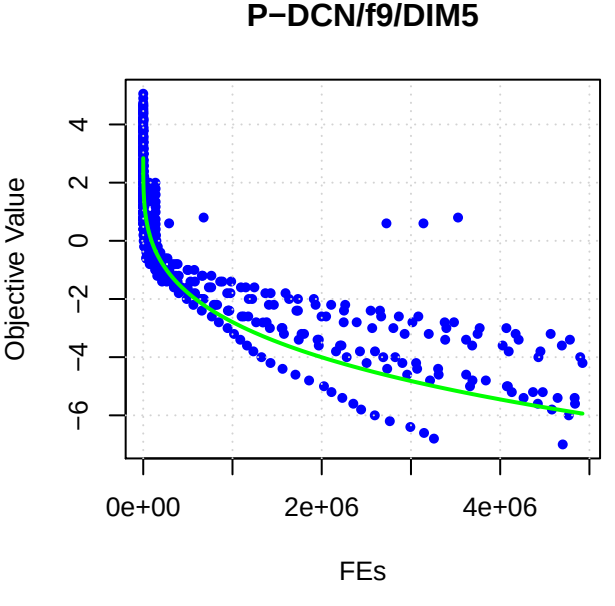
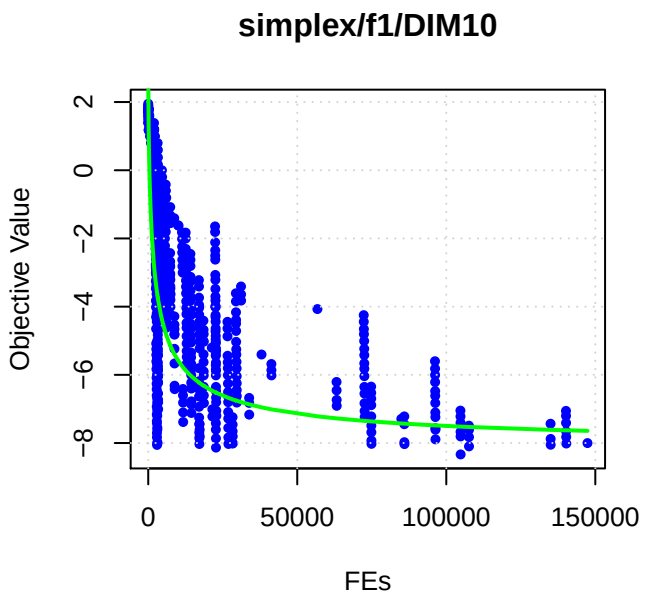
1.0e+07
2.0e+07
6
5
4
3
2
1
0
−1


P−DCN/f9/DIM3
Objective Value
FEs
0
500000
1500000
2500000
4
2
0
−2
−4
−6
−8


P−DCN/f9/DIM5
Objective Value
FEs
0e+00
2e+06
4e+06
4
2
0
−2
−4
−6


simplex/f1/DIM10
Objective Value
FEs
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0
−2
−4
−6
−8
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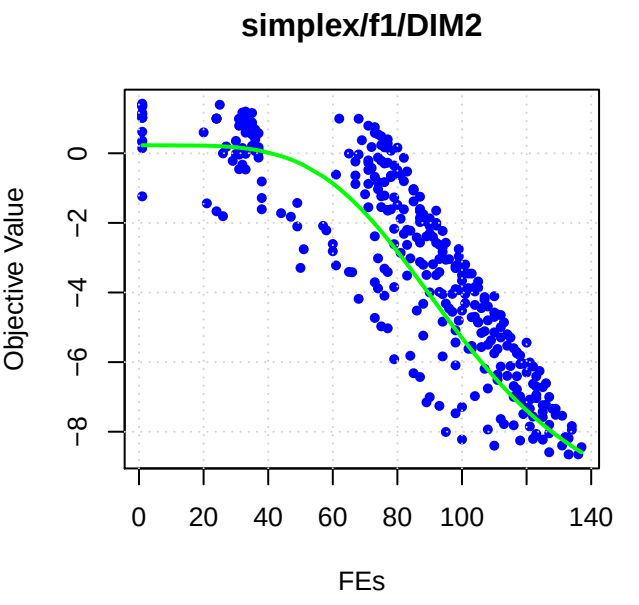
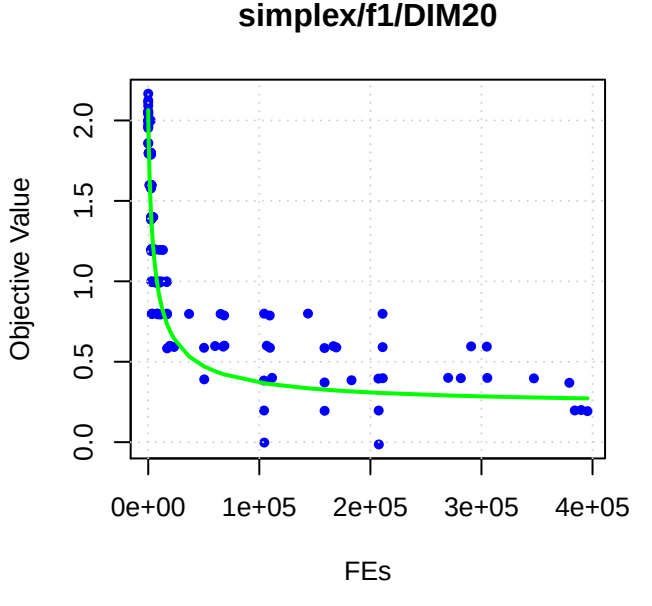
100000
150000


simplex/f1/DIM2
Objective Value
FEs
0
−2
−4
−6
−8
0
20
40
60
80
100
140


simplex/f1/DIM20
Objective Value
FEs
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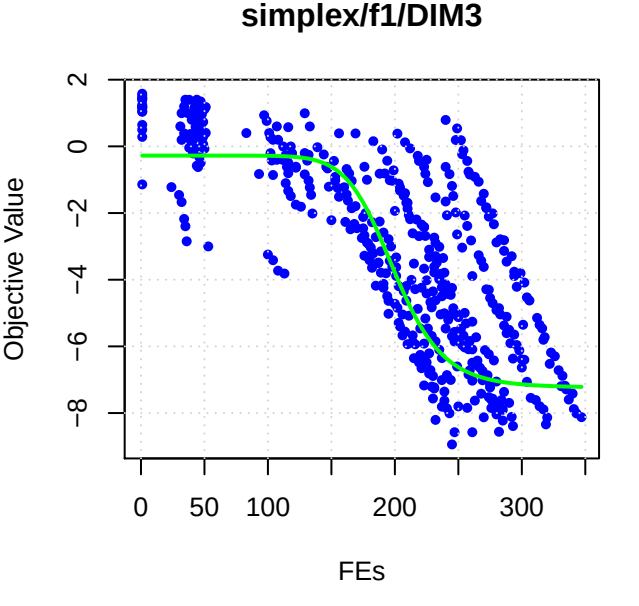
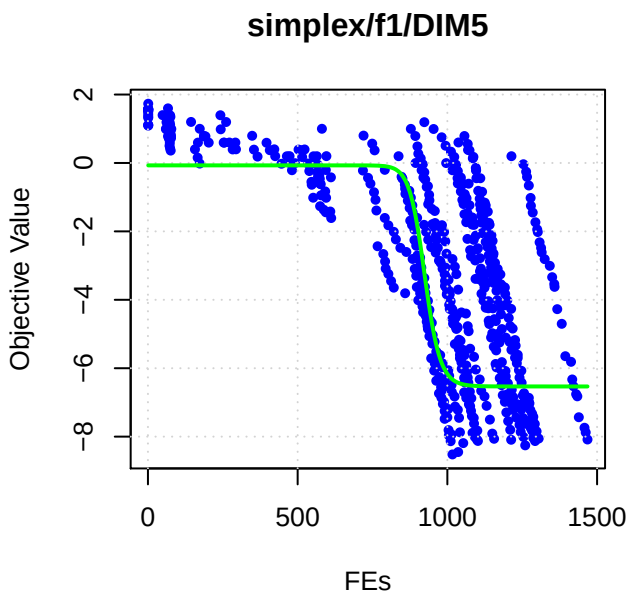
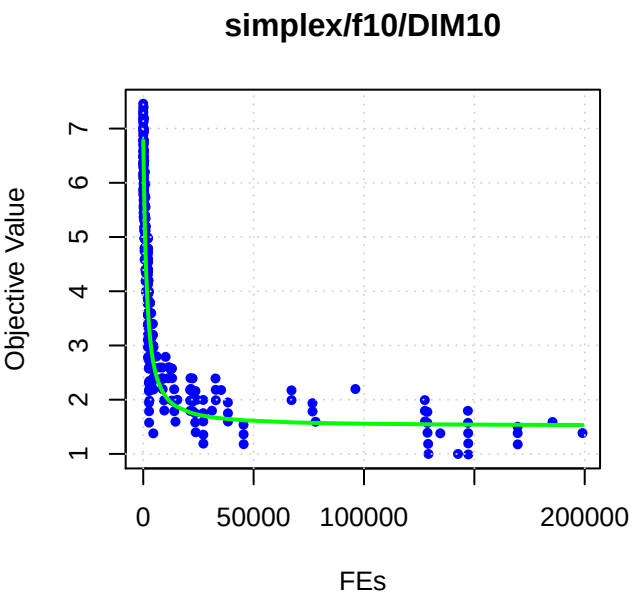
1.5
1.0
0.5
0.0
0e+00
1e+05
2e+05
3e+05
4e+05


simplex/f1/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
200
300


simplex/f1/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
500
1000
1500


simplex/f10/DIM10
Objective Value
FEs
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6
5
4
3
2
1
0
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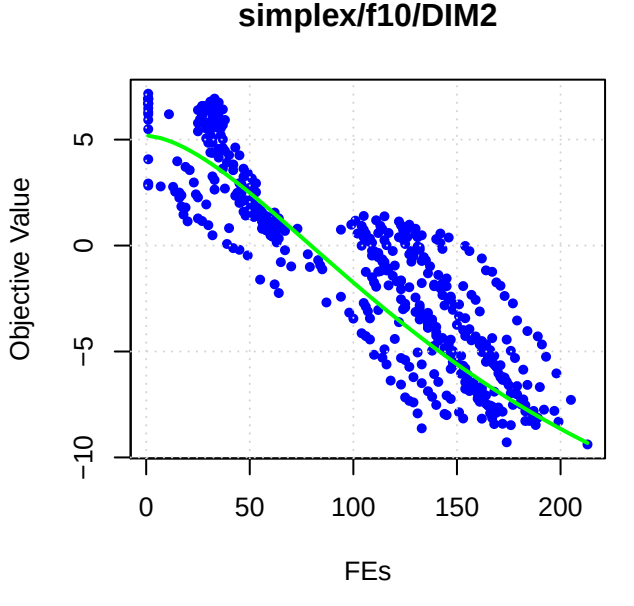
100000
200000


simplex/f10/DIM2
Objective Value
FEs
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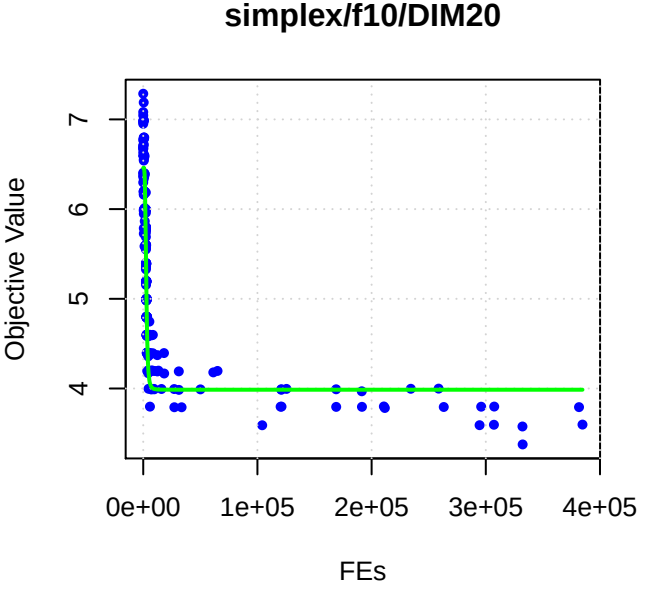
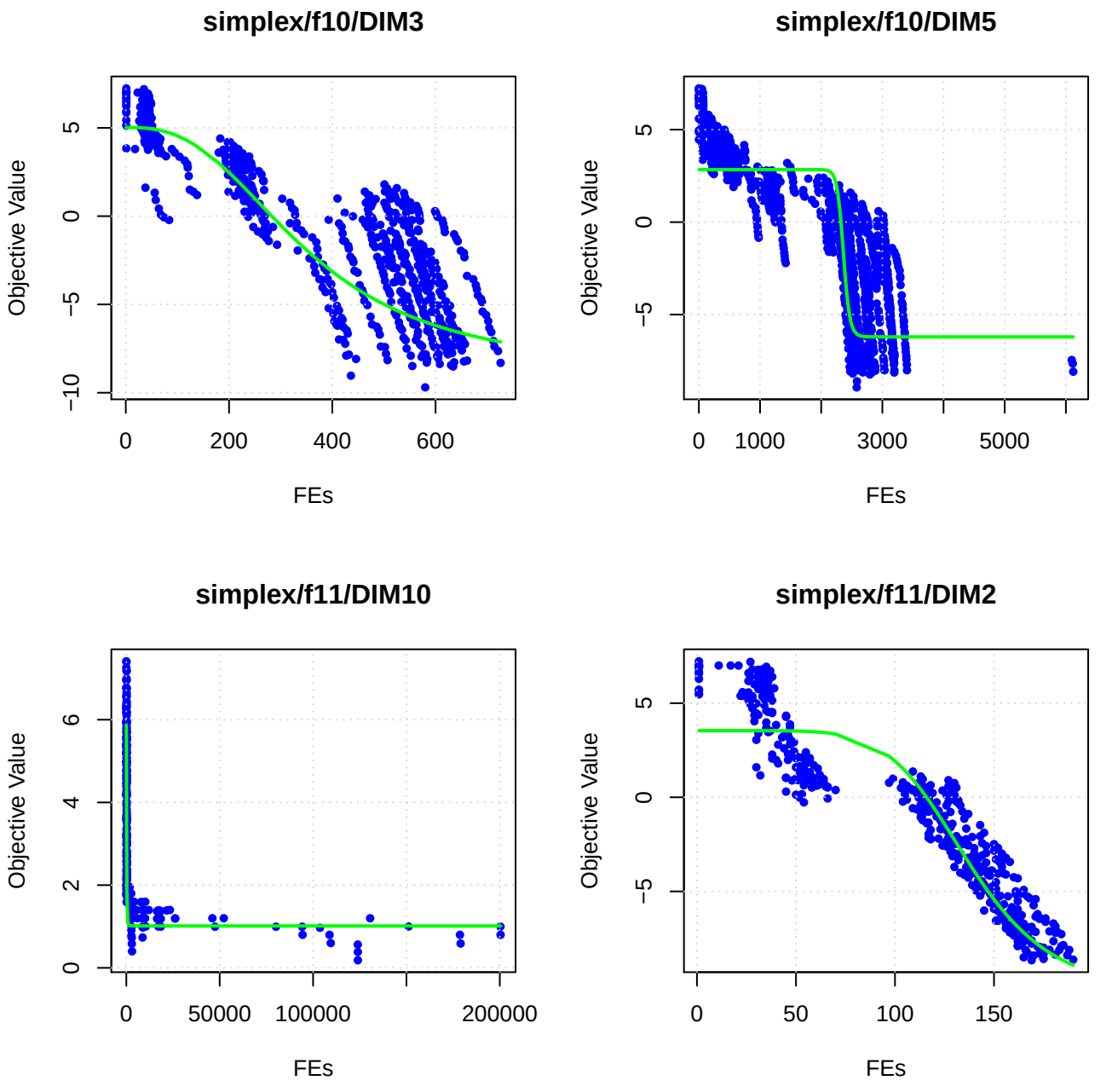
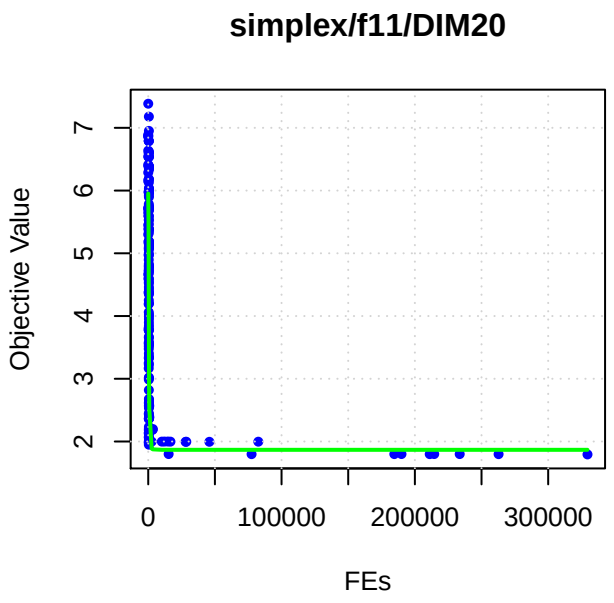
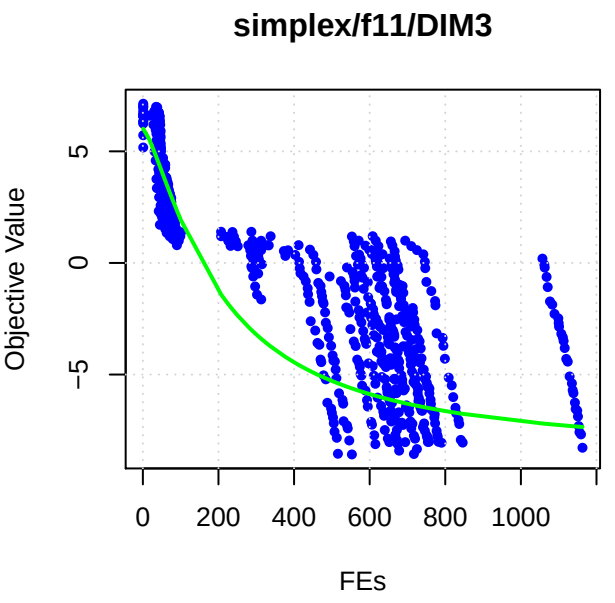
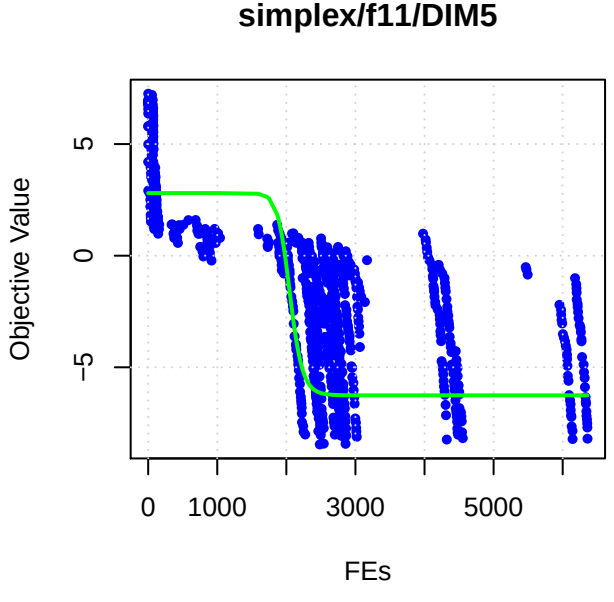
0
−5
−10
0
50
100
150
200

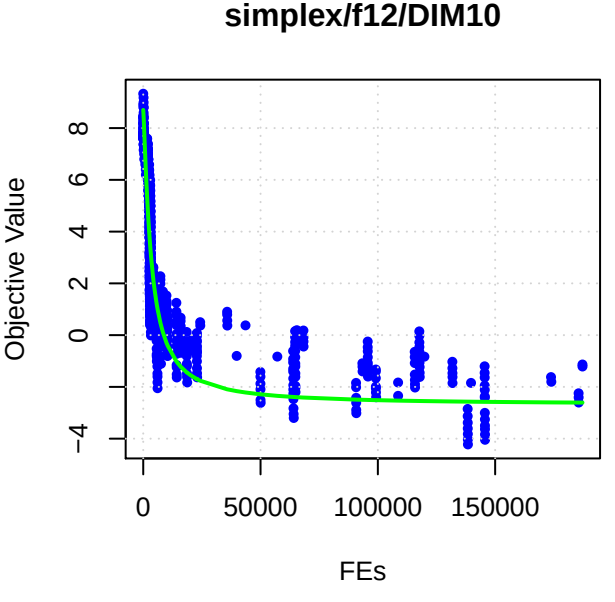

simplex/f10/DIM20
Objective Value
FEs
7
6
5
4
0e+00
1e+05
2e+05
3e+05
4e+05

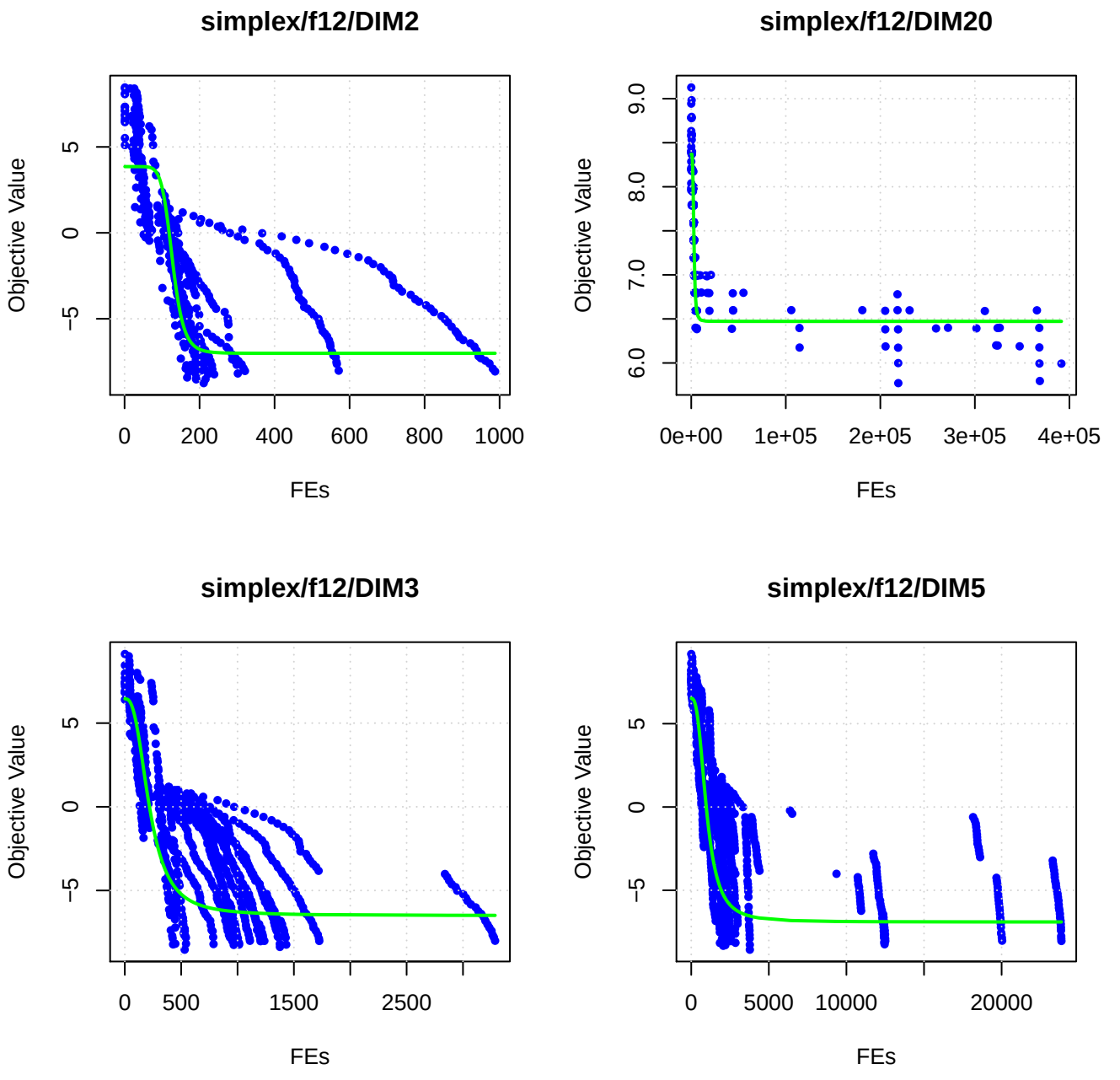

simplex/f10/DIM3
Objective Value
FEs
simplex/f10/DIM5
Objective Value
FEs
simplex/f11/DIM10
Objective Value
FEs
simplex/f11/DIM2
Objective Value
FEs

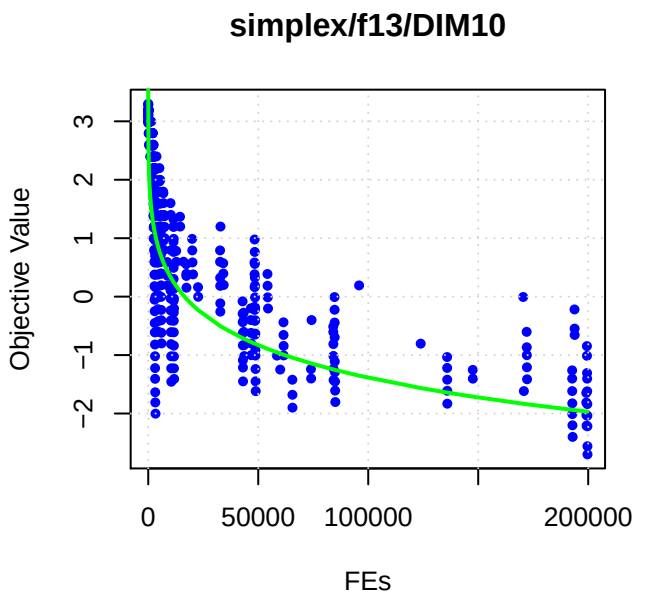

simplex/f11/DIM20
Objective Value
FEs
0
100000
200000
300000
2
3
4
5
6
7

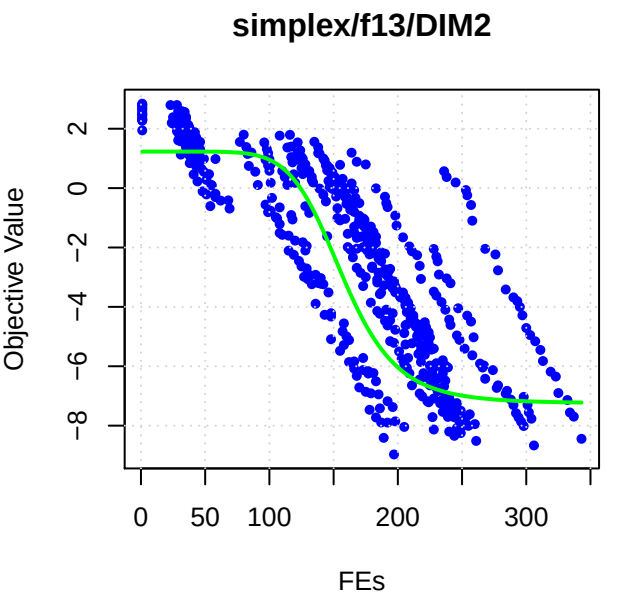

simplex/f11/DIM3
Objective Value
FEs
0
200
400
600
800
1000
−5
0
5

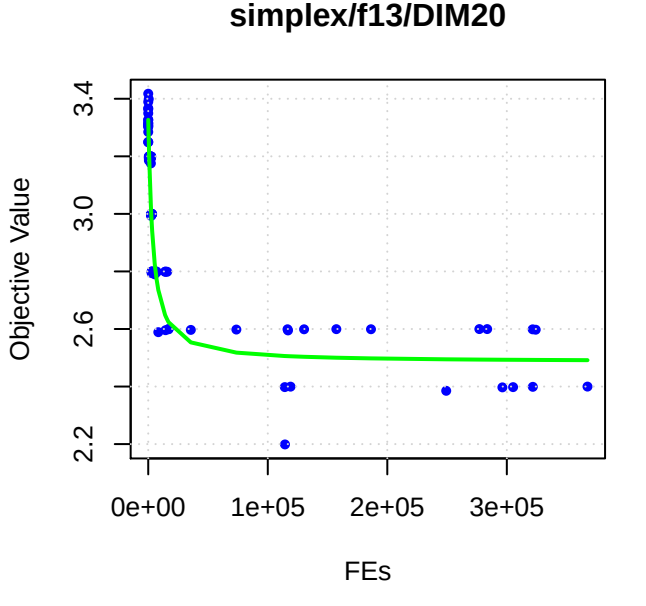

simplex/f11/DIM5
Objective Value
FEs
0
1000
3000
5000
−5
0
5

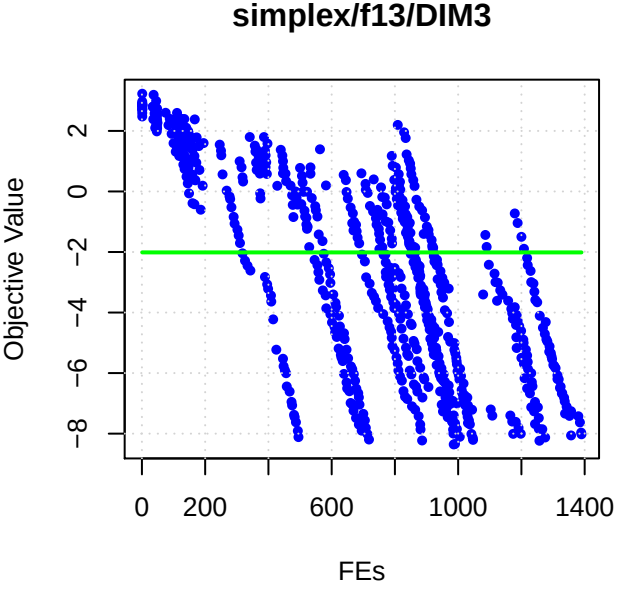

simplex/f12/DIM10
Objective Value
FEs
0
50000
100000
150000
−4
0
2
4
6
8


simplex/f12/DIM2
Objective Value
FEs
simplex/f12/DIM20
Objective Value
FEs
simplex/f12/DIM3
Objective Value
FEs
simplex/f12/DIM5
Objective Value
FEs


simplex/f13/DIM10
Objective Value
FEs
3
2
1
0
−1
−2
0
50000
100000
200000


simplex/f13/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
200
300


simplex/f13/DIM20
Objective Value
FEs
3.4
3.0
2.6
2.2
0e+00
1e+05
2e+05
3e+05


simplex/f13/DIM3
Objective Value
FEs
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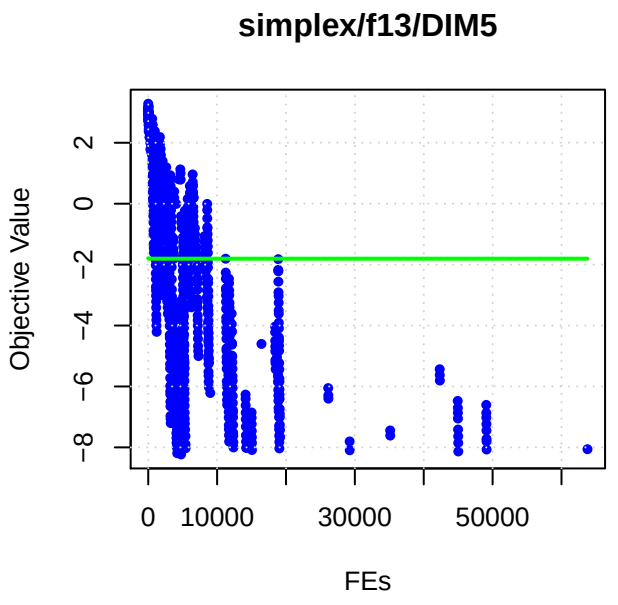
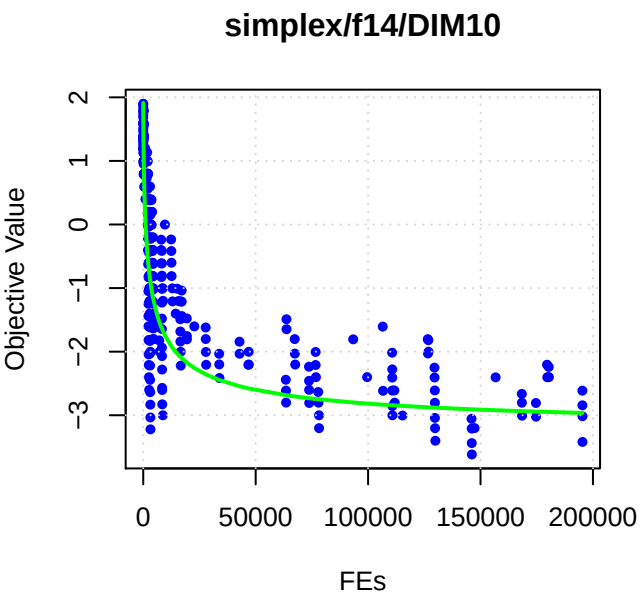
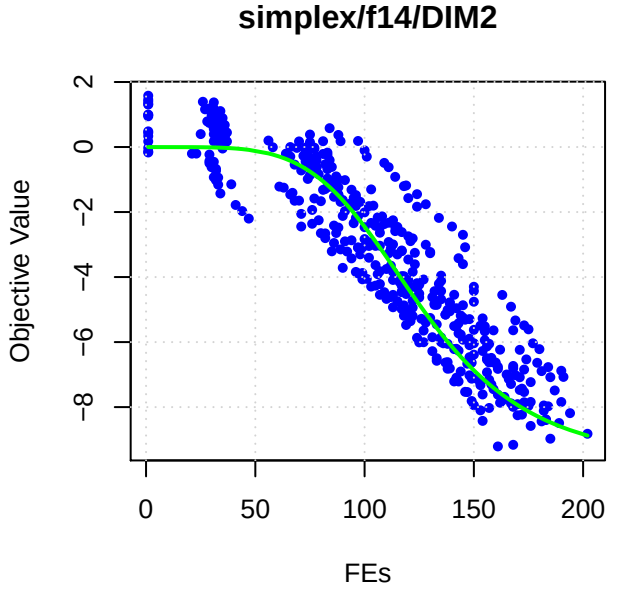
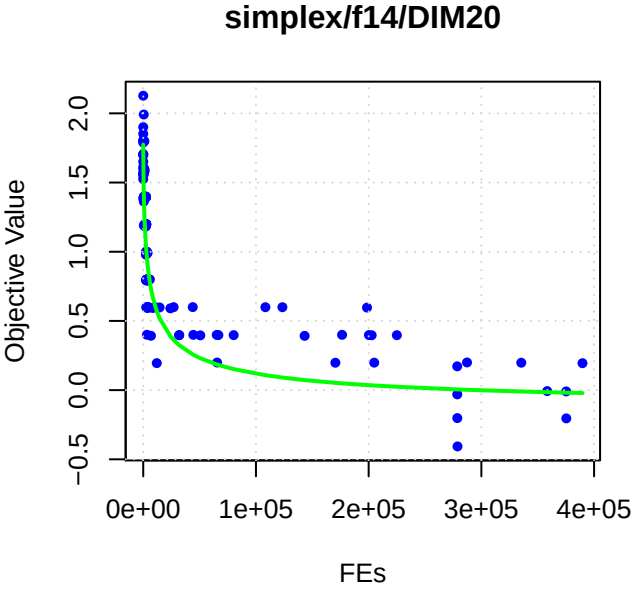
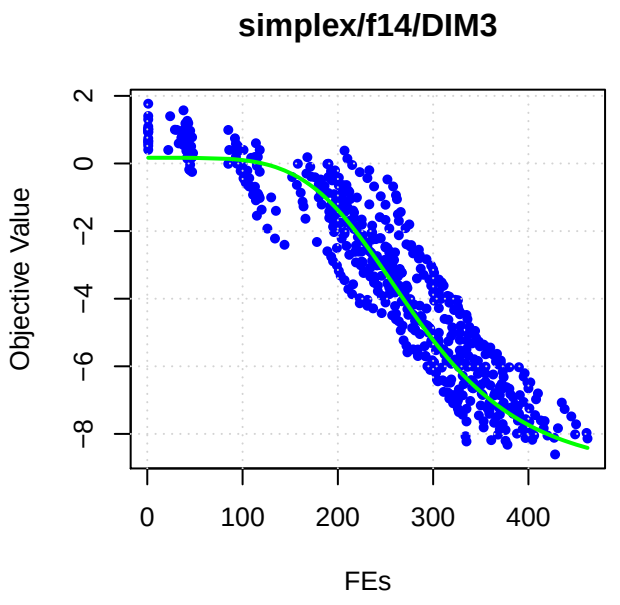
0
−2
−4
−6
−8
0
200
600
1000
1400

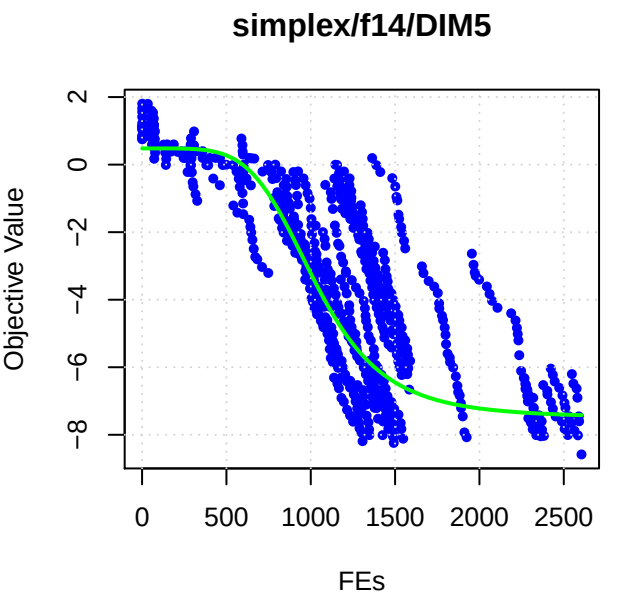

simplex/f13/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
10000
30000
50000


simplex/f14/DIM10
Objective Value
FEs
2
1
0
−1
−2
−3
0
50000
100000
150000
200000


simplex/f14/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50
100
150
200


simplex/f14/DIM20
Objective Value
FEs
2.0
1.5
1.0
0.5
0.0
−0.5
0e+00
1e+05
2e+05
3e+05
4e+05


simplex/f14/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
100
200
300
400


simplex/f14/DIM5
Objective Value
FEs
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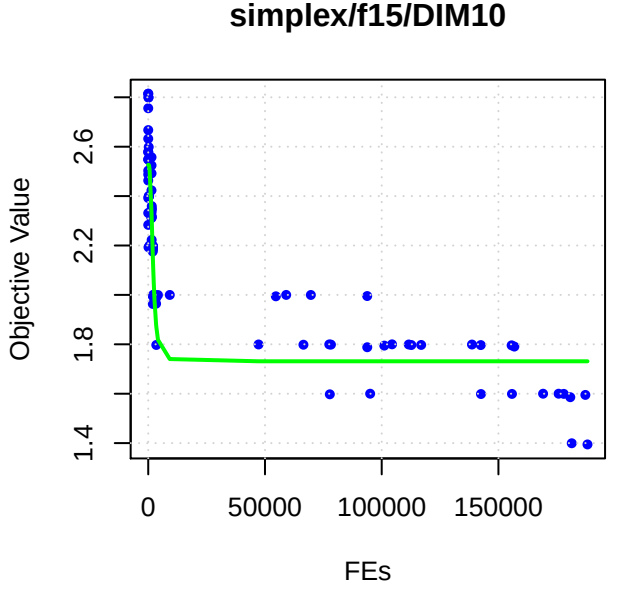
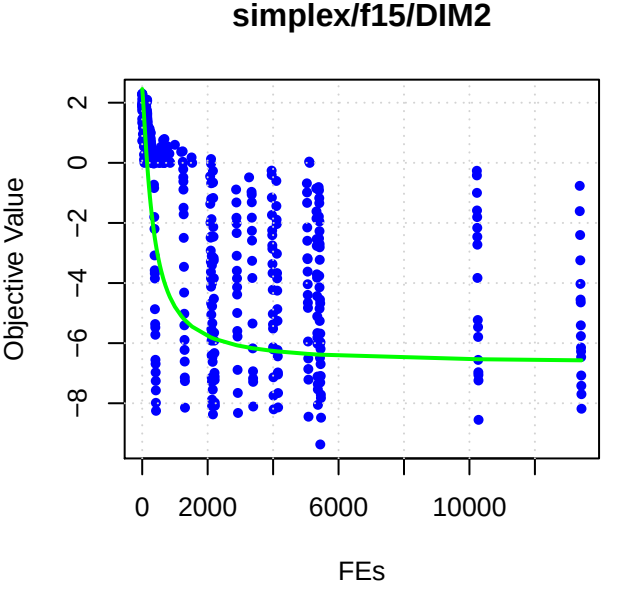
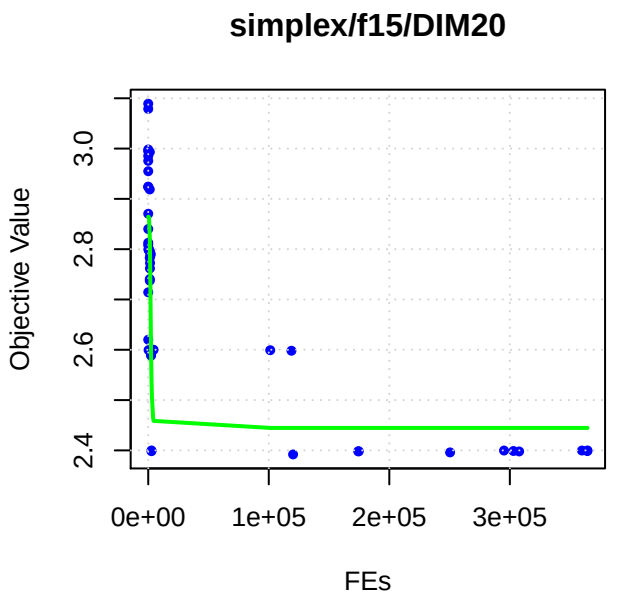
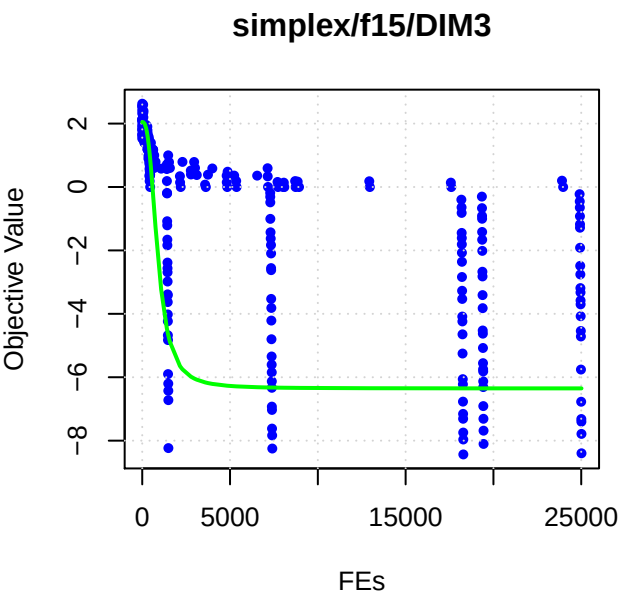
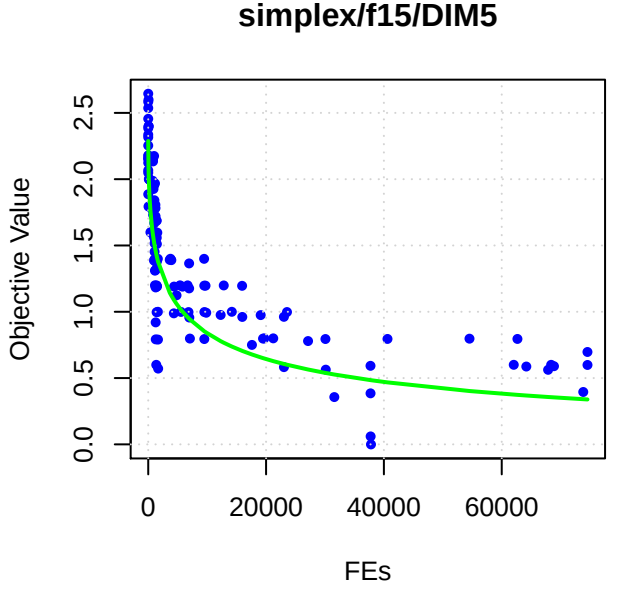
0
−2
−4
−6
−8
0
500
1000
1500
2000
2500


simplex/f15/DIM10
Objective Value
FEs
2.6
2.2
1.8
1.4
0
50000
100000
150000


simplex/f15/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
2000
6000
10000


simplex/f15/DIM20
Objective Value
2.4
2.6
2.8
3.0
0e+00
1e+05
2e+05
3e+05
FEs


simplex/f15/DIM3
Objective Value
−8
−6
−4
−2
0
2
0
5000
15000
25000
FEs


simplex/f15/DIM5
Objective Value
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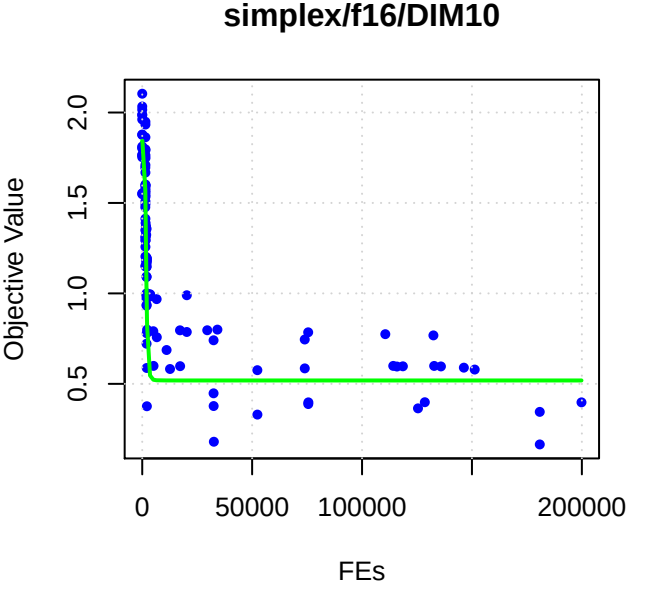
0.5
1.0
1.5
2.0
2.5
0
20000
40000
60000
FEs


simplex/f16/DIM10
Objective Value
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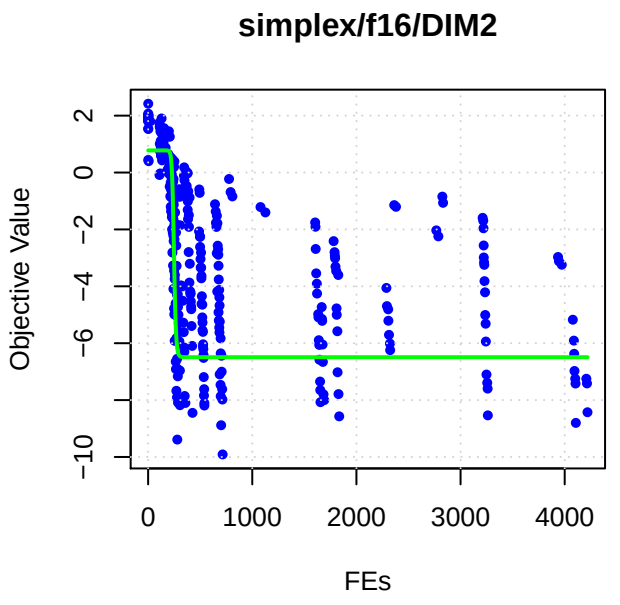
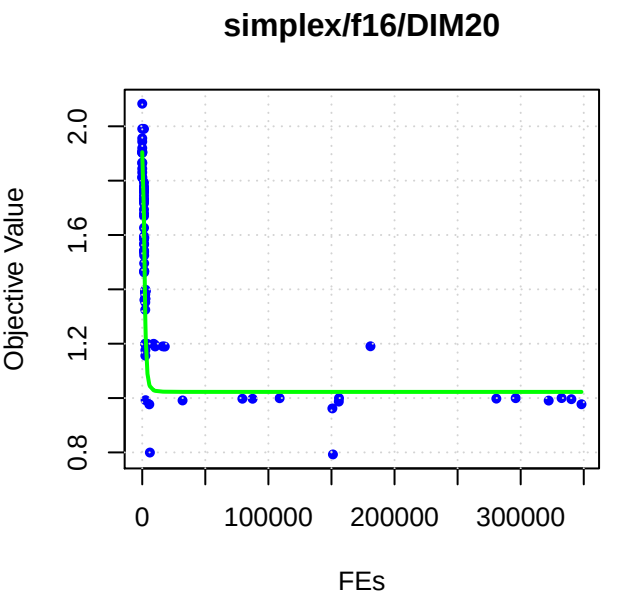
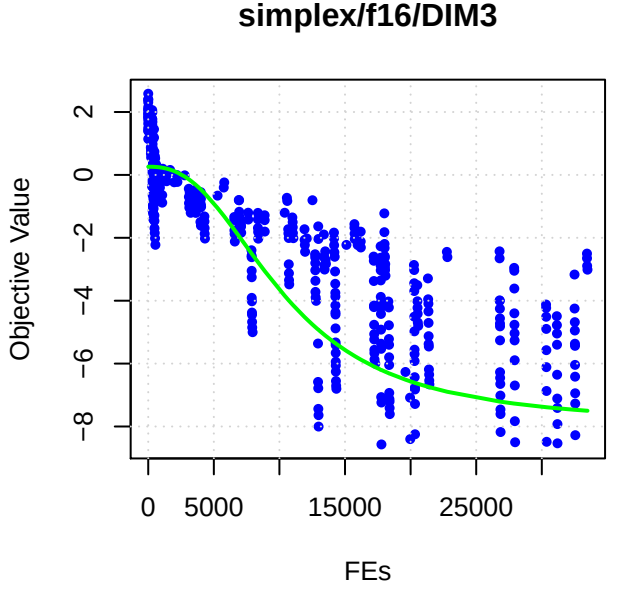
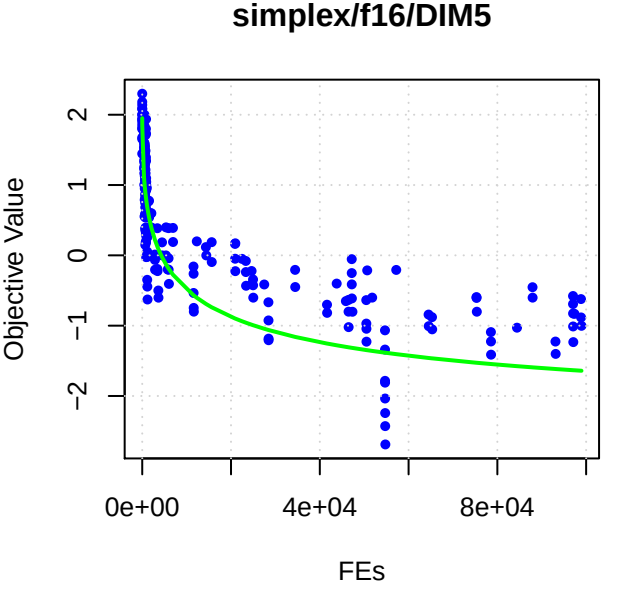
1.0
1.5
2.0
0
50000
100000
200000
FEs


simplex/f16/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−10
0
1000
2000
3000
4000


simplex/f16/DIM20
Objective Value
FEs
2.0
1.6
1.2
0.8
0
100000
200000
300000


simplex/f16/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
5000
15000
25000


simplex/f16/DIM5
Objective Value
FEs
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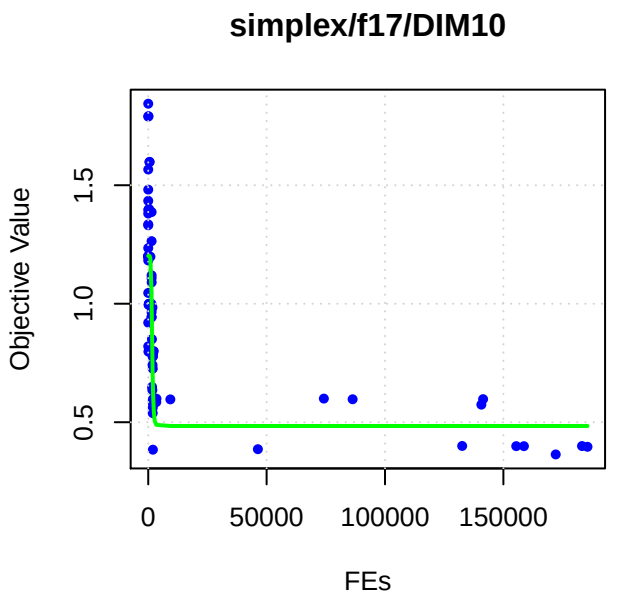
1
0
−1
−2
0e+00
4e+04
8e+04


simplex/f17/DIM10
Objective Value
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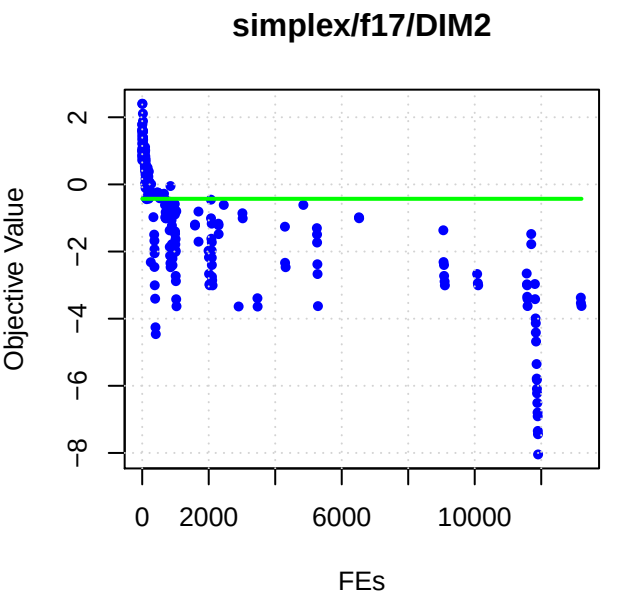
1.0
1.5
0
50000
100000
150000
FEs


simplex/f17/DIM2
Objective Value
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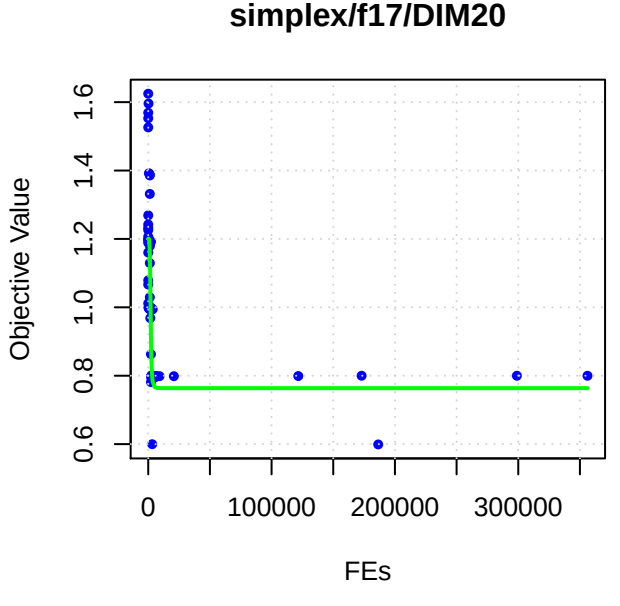
0
−2
−4
−6
−8
0
2000
6000
10000
FEs


simplex/f17/DIM20
Objective Value
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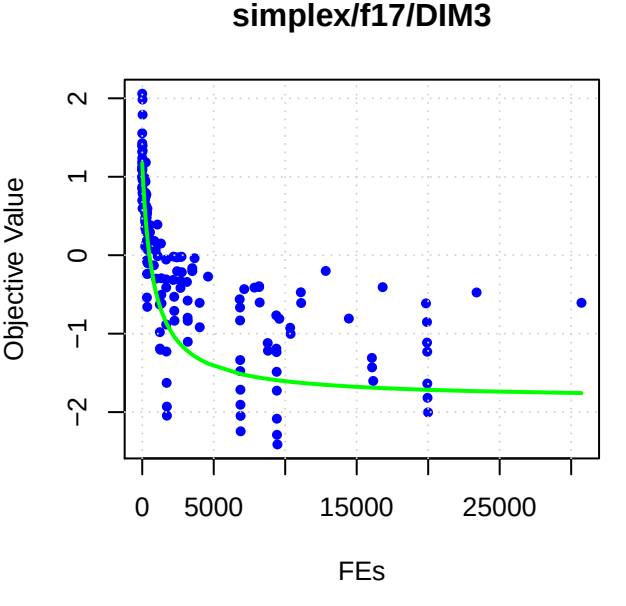
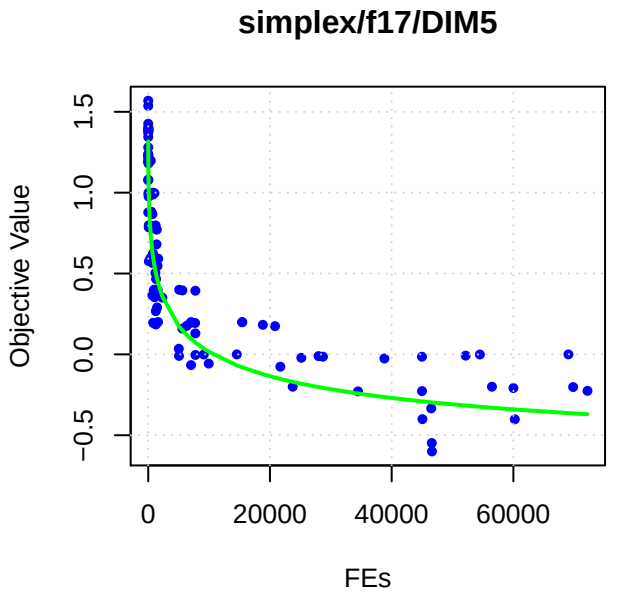
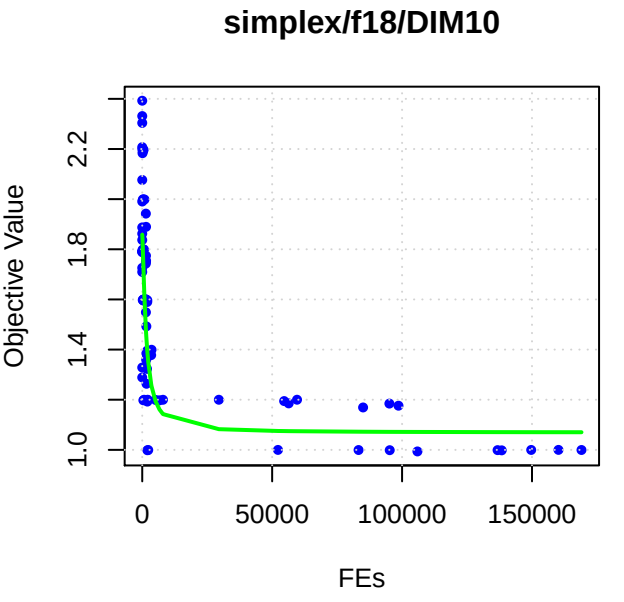
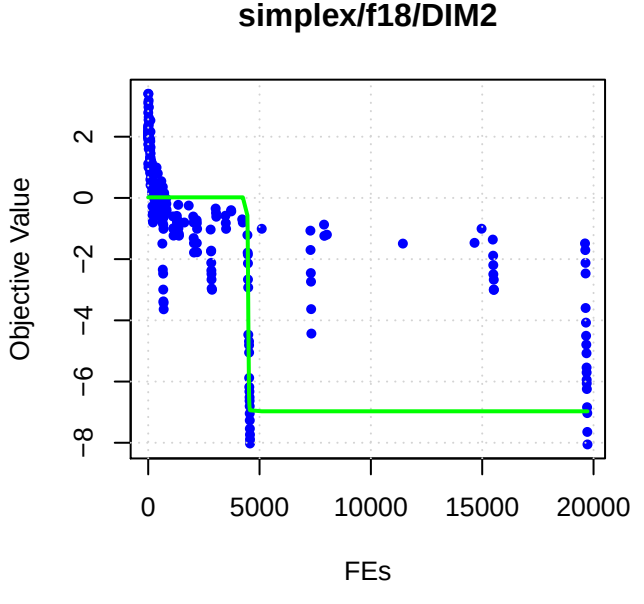
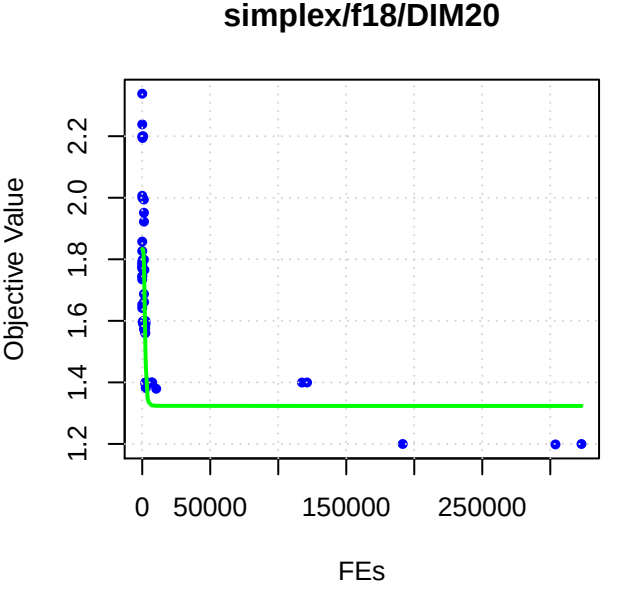
0.8
1.0
1.2
1.4
1.6
0
100000
200000
300000
FEs

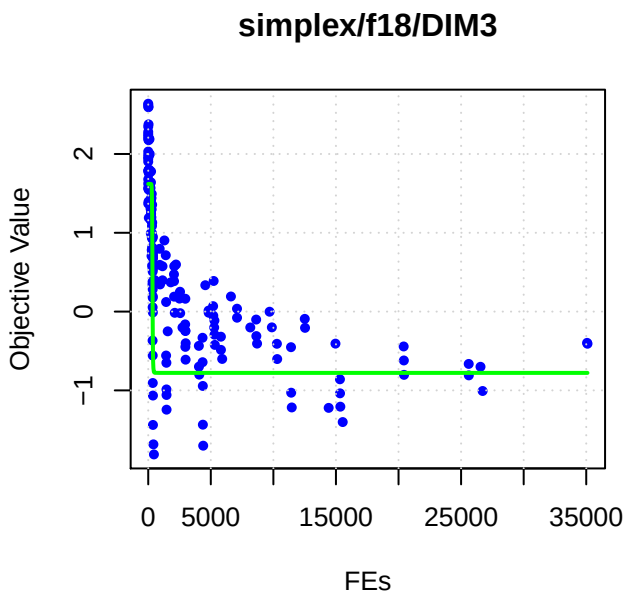

simplex/f17/DIM3
Objective Value
2
1
0
−1
−2
0
5000
15000
25000
FEs

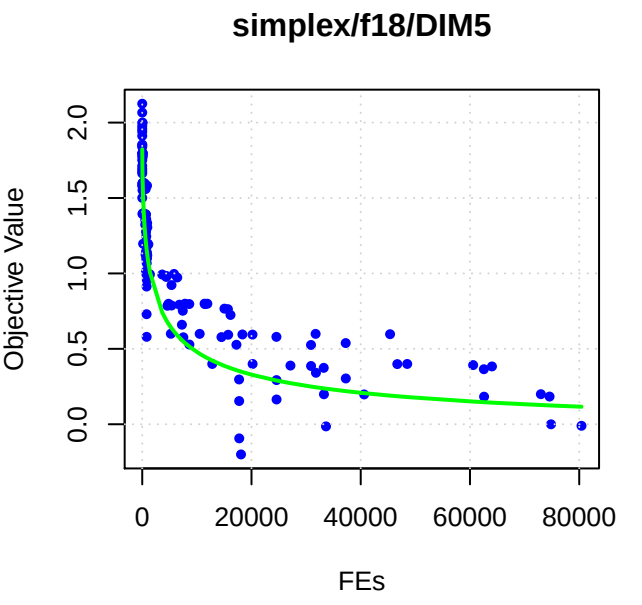

simplex/f17/DIM5
Objective Value
FEs
1.5
1.0
0.5
0.0
−0.5
0
20000
40000
60000


simplex/f18/DIM10
Objective Value
FEs
2.2
1.8
1.4
1.0
0
50000
100000
150000


simplex/f18/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
5000
10000
15000
20000


simplex/f18/DIM20
Objective Value
FEs
2.2
2.0
1.8
1.6
1.4
1.2
0
50000
150000
250000


simplex/f18/DIM3
Objective Value
FEs
0
5000
15000
25000
35000
−1
0
1
2


simplex/f18/DIM5
Objective Value
FEs
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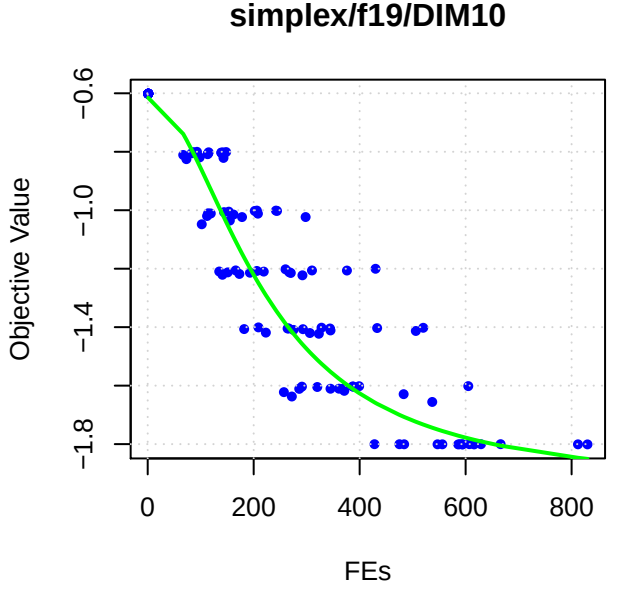
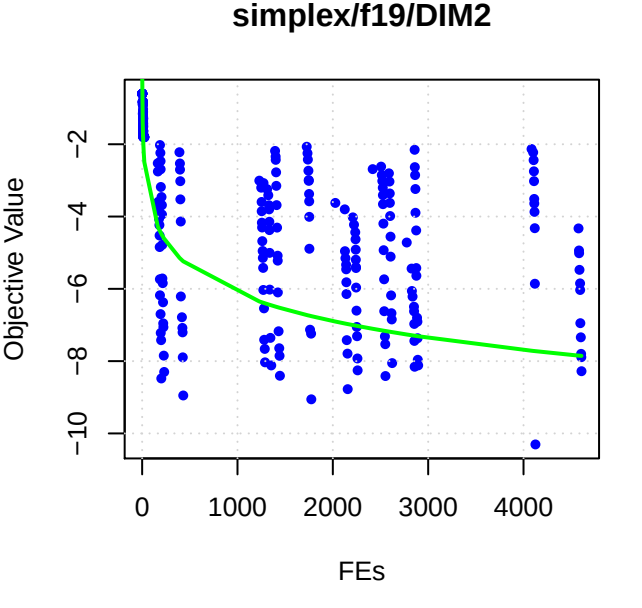
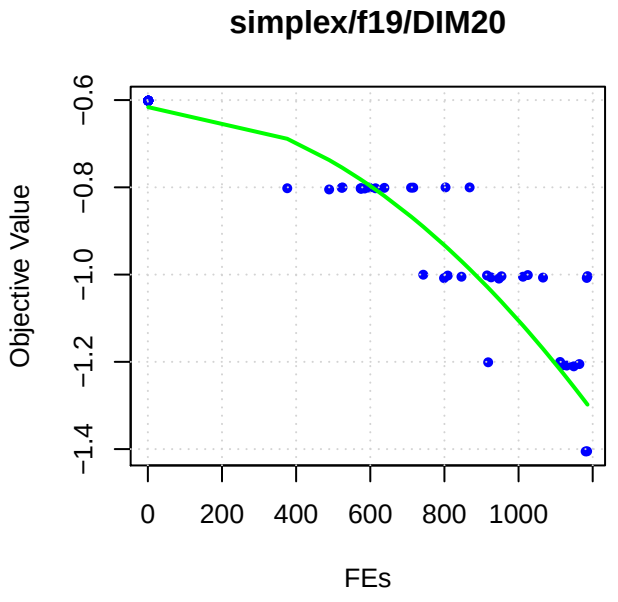
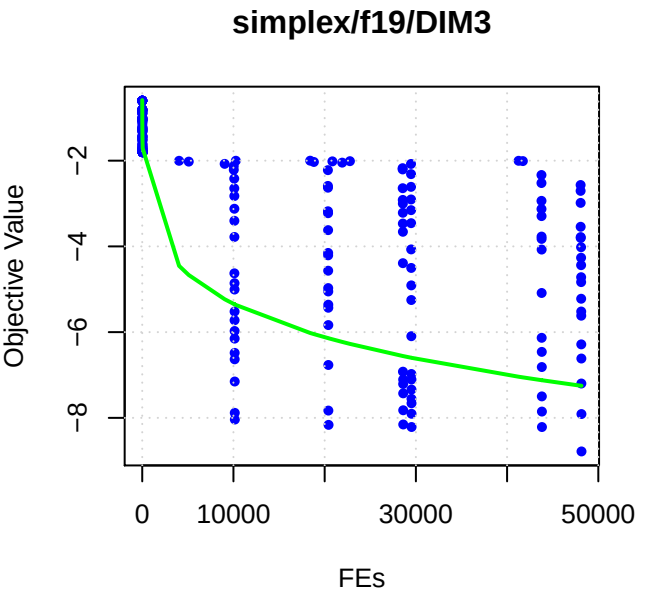
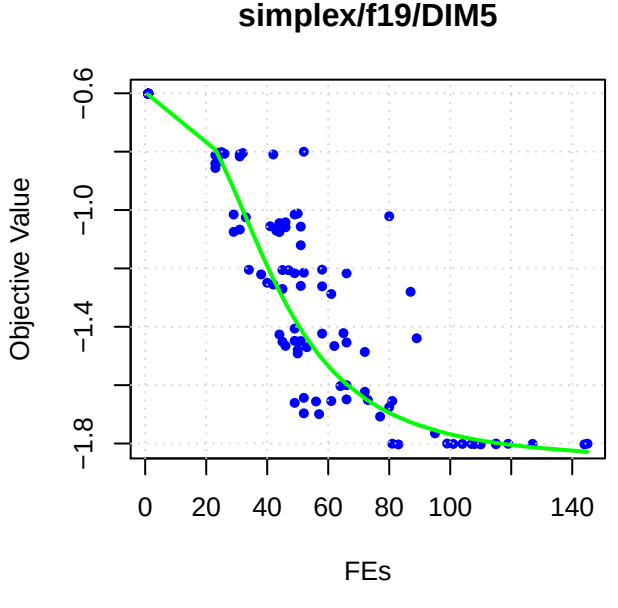
20000
40000
60000
80000
0.0
0.5
1.0
1.5
2.0

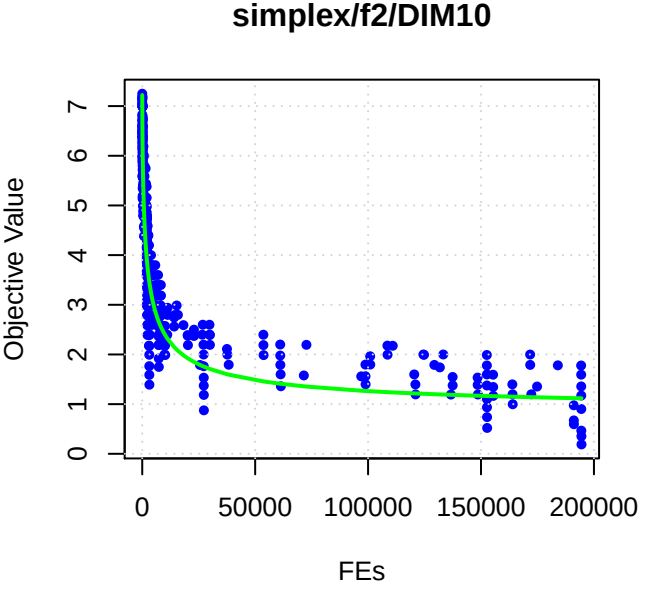

simplex/f19/DIM10
Objective Value
FEs
0
200
400
600
800
−1.8
−1.4
−1.0
−0.6

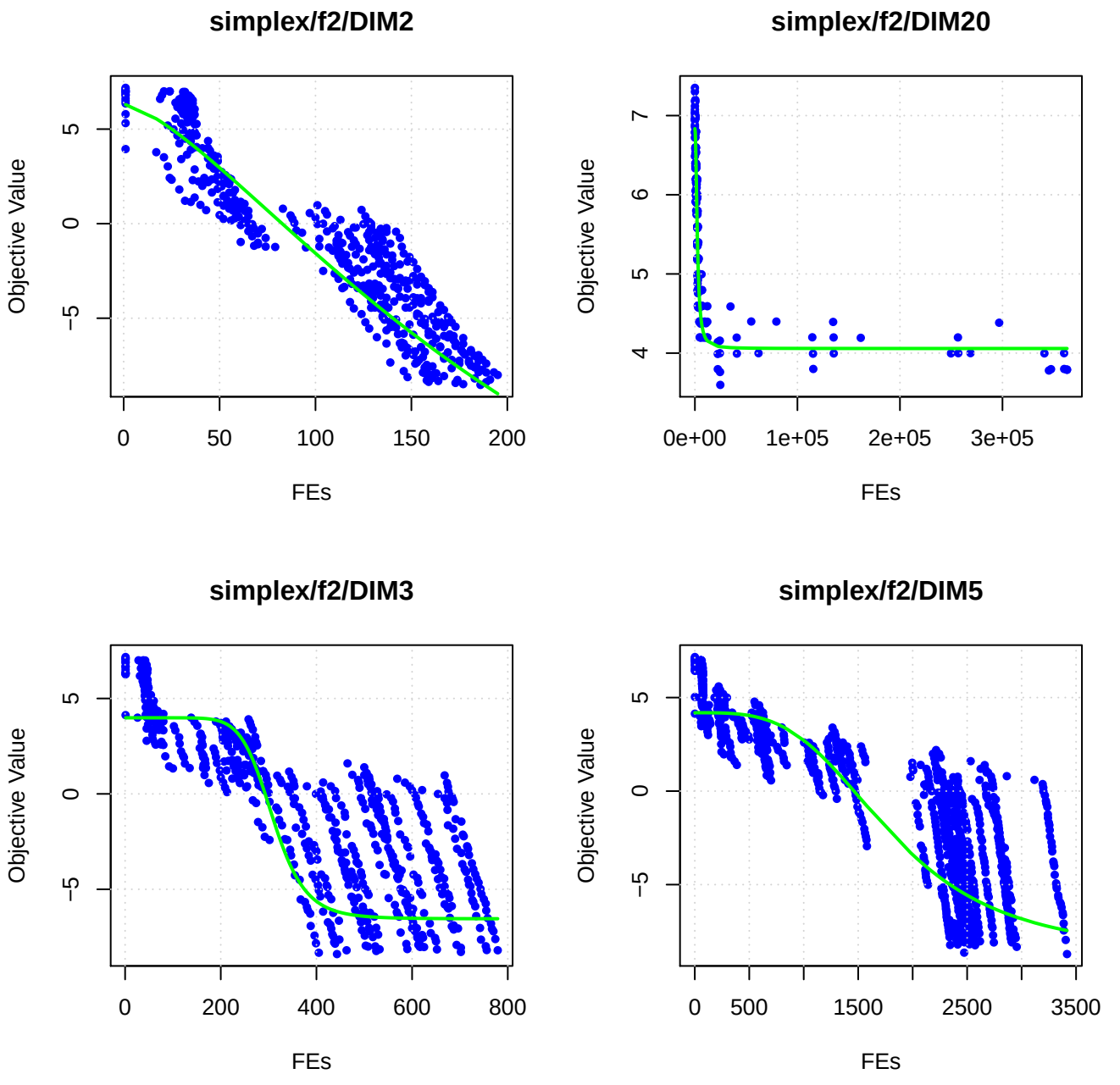

simplex/f19/DIM2
Objective Value
FEs
0
1000
2000
3000
4000
−10
−8
−6
−4
−2

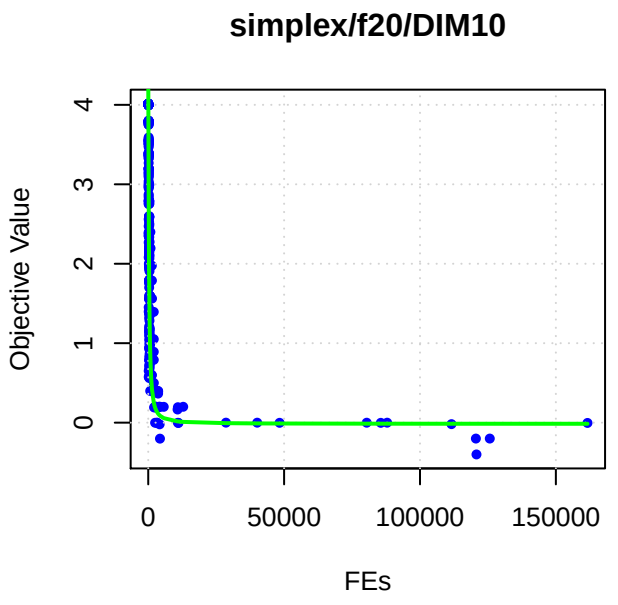

simplex/f19/DIM20
Objective Value
−0.6
−0.8
−1.0
−1.2
−1.4
0
200
400
600
800
1000
FEs

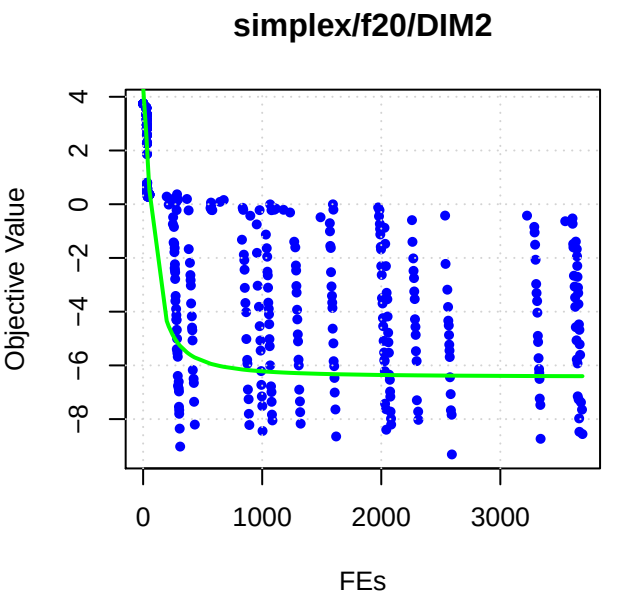

simplex/f19/DIM3
Objective Value
−2
−4
−6
−8
0
10000
30000
50000
FEs

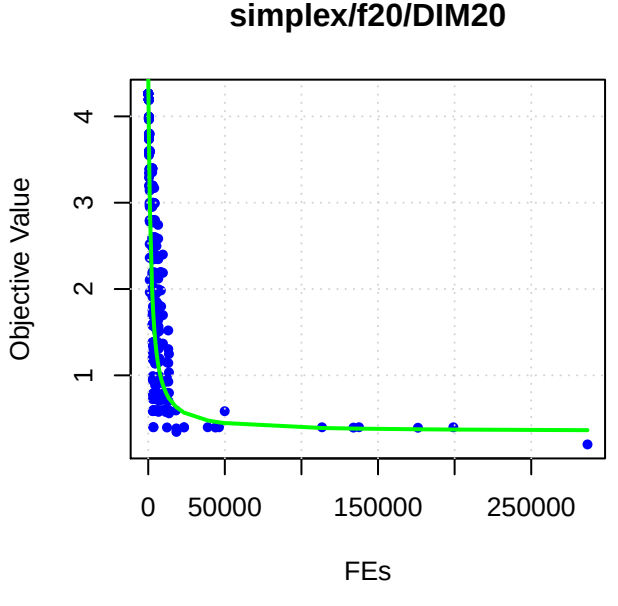

simplex/f19/DIM5
Objective Value
−0.6
−1.0
−1.4
−1.8
0
20
40
60
80
100
140
FEs

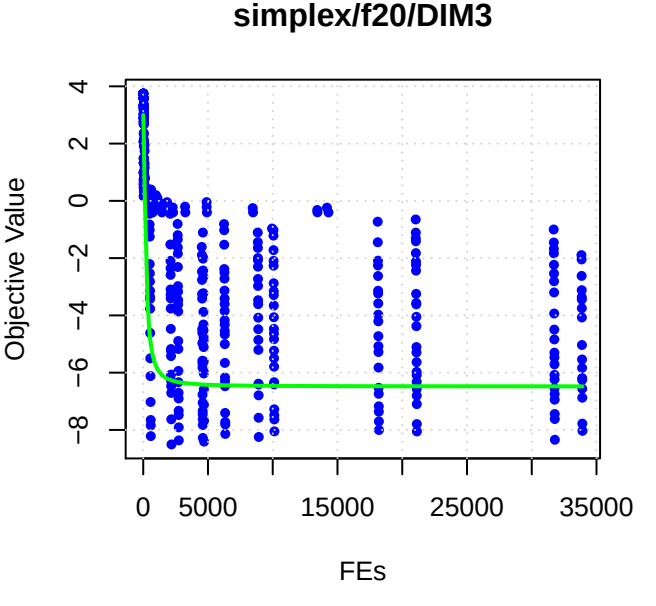

simplex/f2/DIM10
Objective Value
0
1
2
3
4
5
6
7
0
50000
100000
150000
200000
FEs

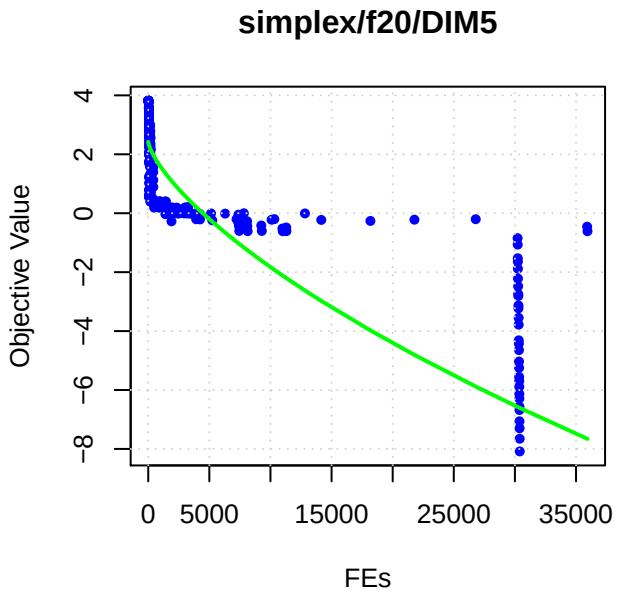

simplex/f2/DIM2
Objective Value
FEs
simplex/f2/DIM20
Objective Value
FEs
simplex/f2/DIM3
Objective Value
FEs
simplex/f2/DIM5
Objective Value
FEs

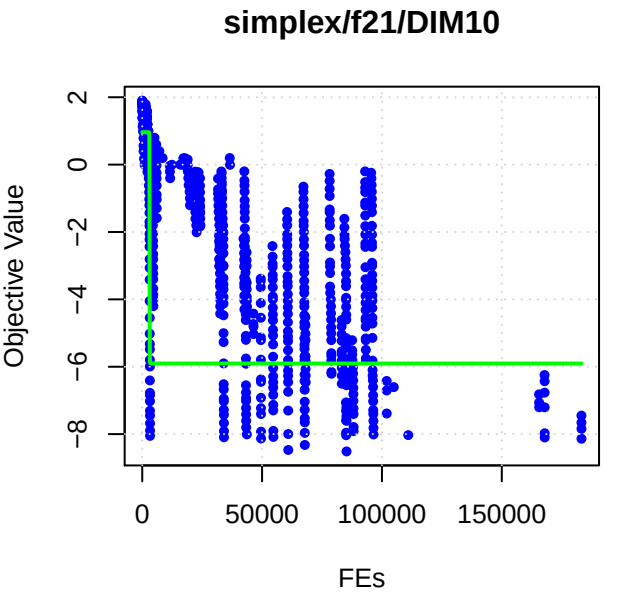

simplex/f20/DIM10
Objective Value
FEs
0
1
2
3
4
0
50000
100000
150000


simplex/f20/DIM2
Objective Value
FEs
4
2
0
−2
−4
−6
−8
0
1000
2000
3000


simplex/f20/DIM20
Objective Value
FEs
1
2
3
4
0
50000
150000
250000


simplex/f20/DIM3
Objective Value
FEs
4
2
0
−2
−4
−6
−8
0
5000
15000
25000
35000


simplex/f20/DIM5
Objective Value
FEs
4
2
0
−2
−4
−6
−8
0
5000
15000
25000
35000


simplex/f21/DIM10
Objective Value
FEs
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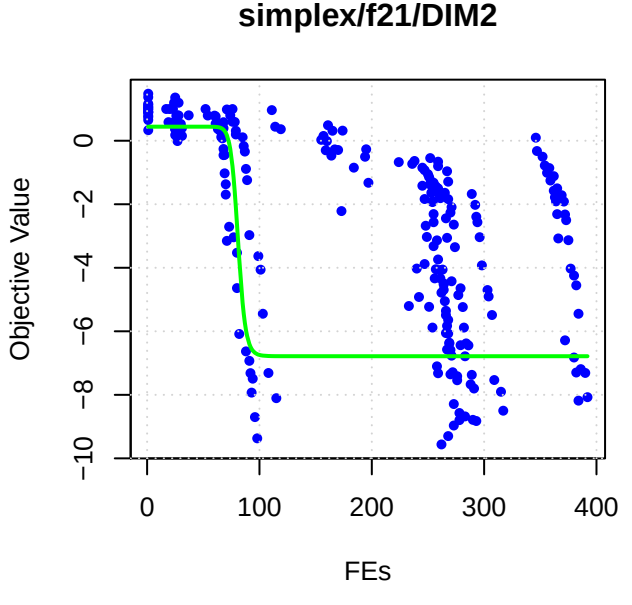
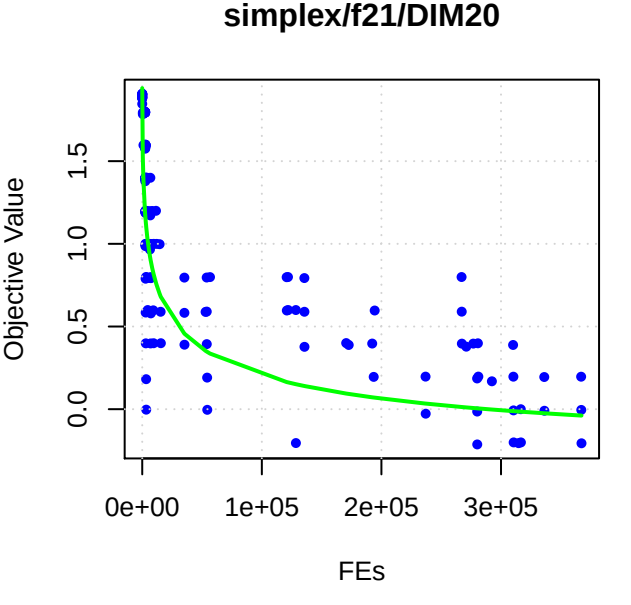
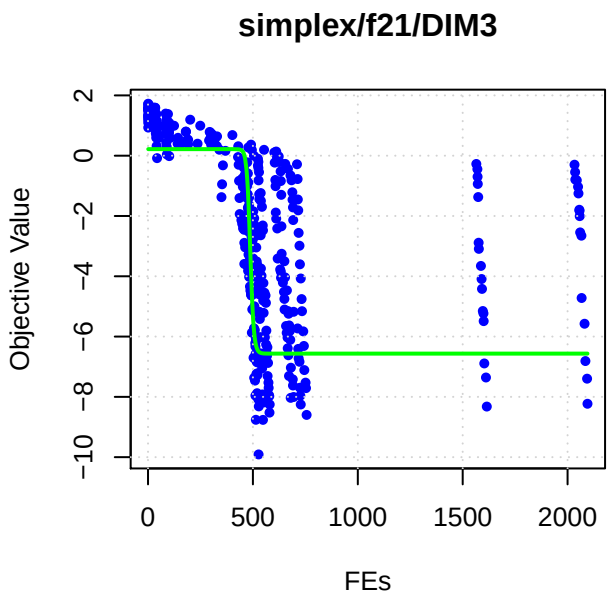
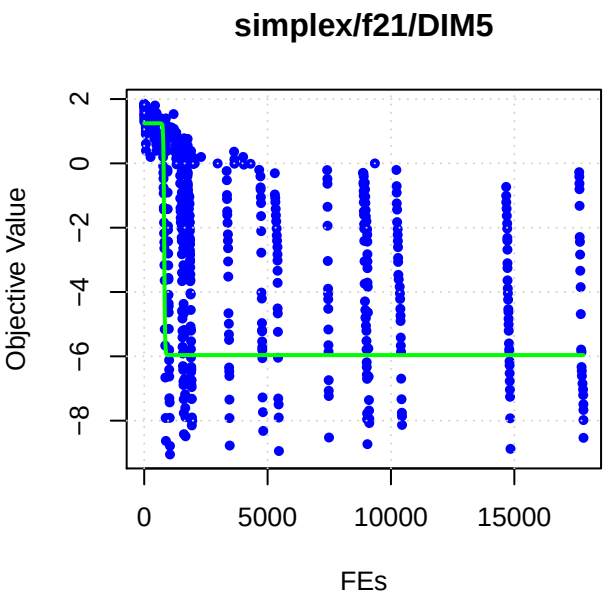
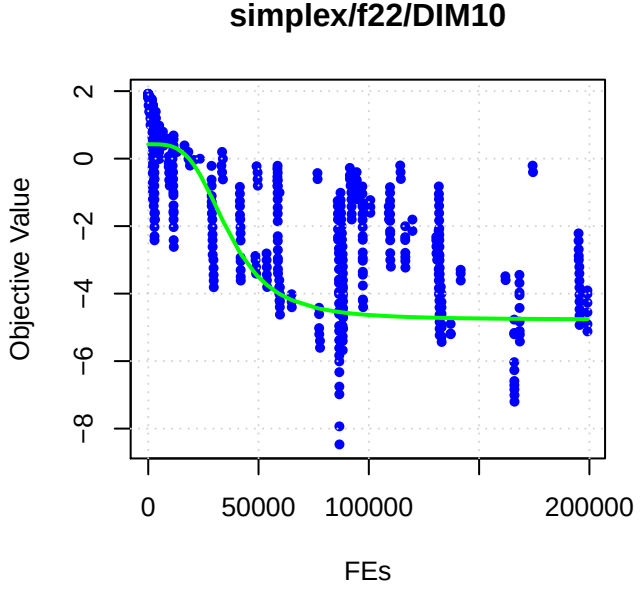
0
−2
−4
−6
−8
0
50000
100000
150000

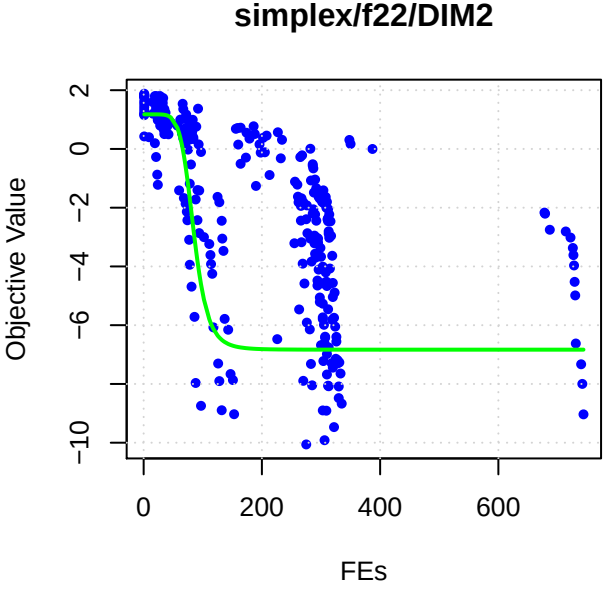

simplex/f21/DIM2
Objective Value
FEs
0
−2
−4
−6
−8
−10
0
100
200
300
400

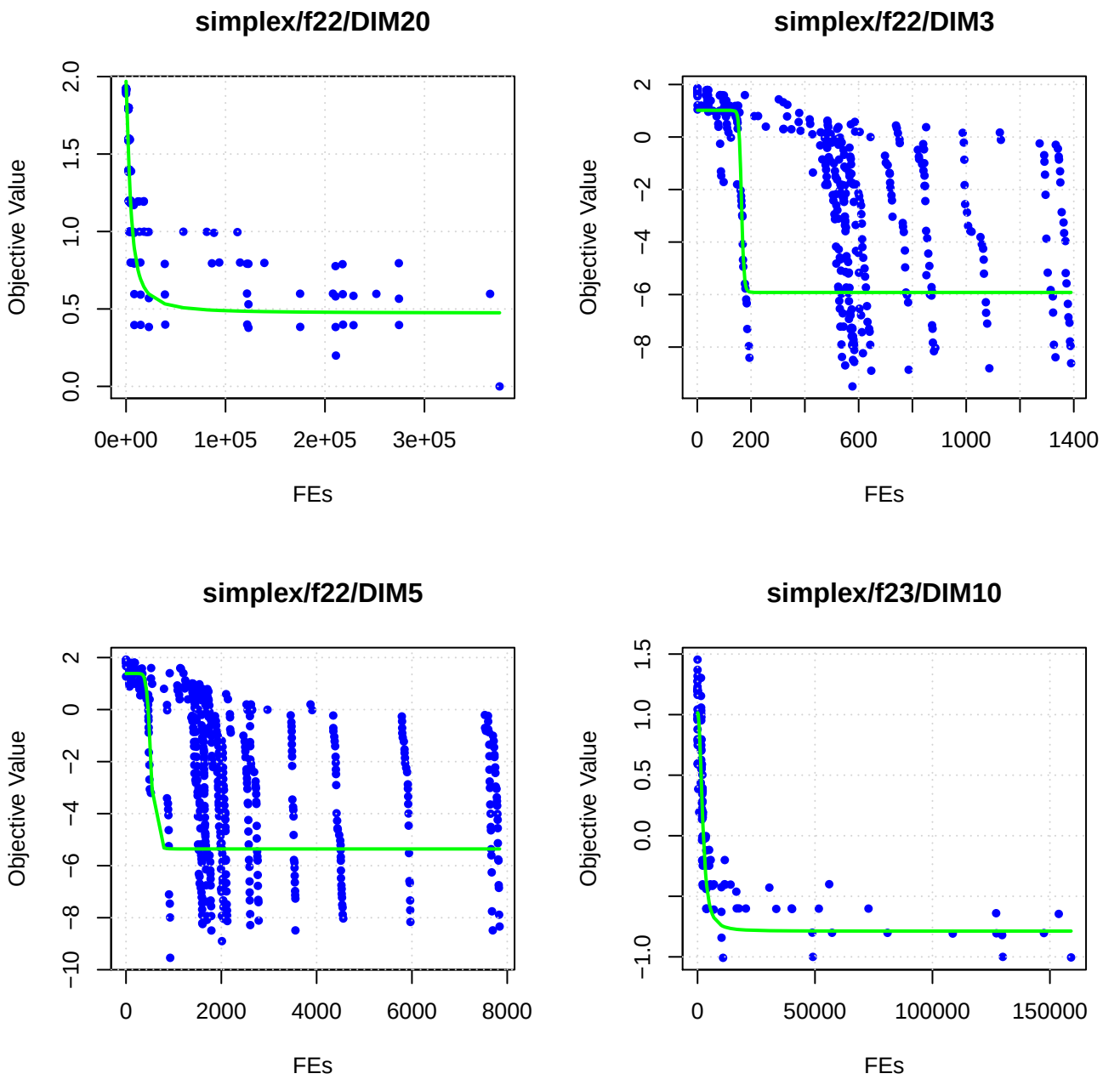

simplex/f21/DIM20
Objective Value
FEs
1.5
1.0
0.5
0.0
0e+00
1e+05
2e+05
3e+05

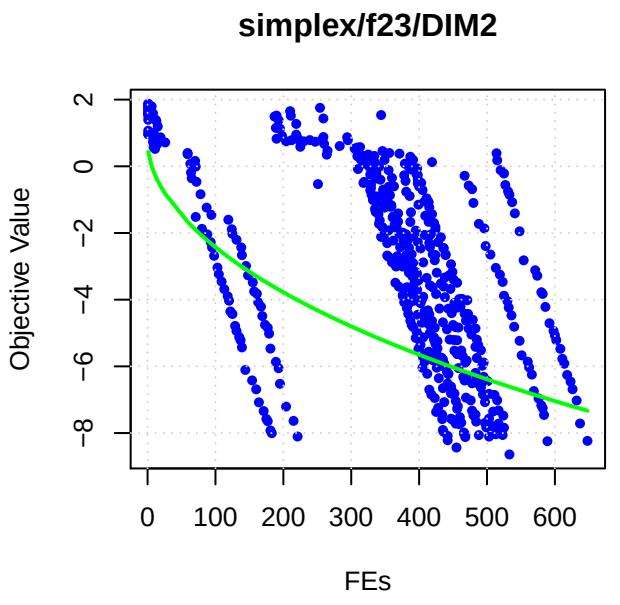

simplex/f21/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
−10
0
500
1000
1500
2000


simplex/f21/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
5000
10000
15000


simplex/f22/DIM10
Objective Value
FEs
2
0
−2
−4
−6
−8
0
50000
100000
200000


simplex/f22/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−10
0
200
400
600


simplex/f22/DIM20
Objective Value
FEs
0.0
0.5
1.0
1.5
2.0
0e+00
1e+05
2e+05
3e+05
simplex/f22/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
200
600
1000
1400
simplex/f22/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
−10
0
2000
4000
6000
8000
simplex/f23/DIM10
Objective Value
FEs
1.5
1.0
0.5
0.0
−1.0
0
50000
100000
150000


simplex/f23/DIM2
Objective Value
FEs
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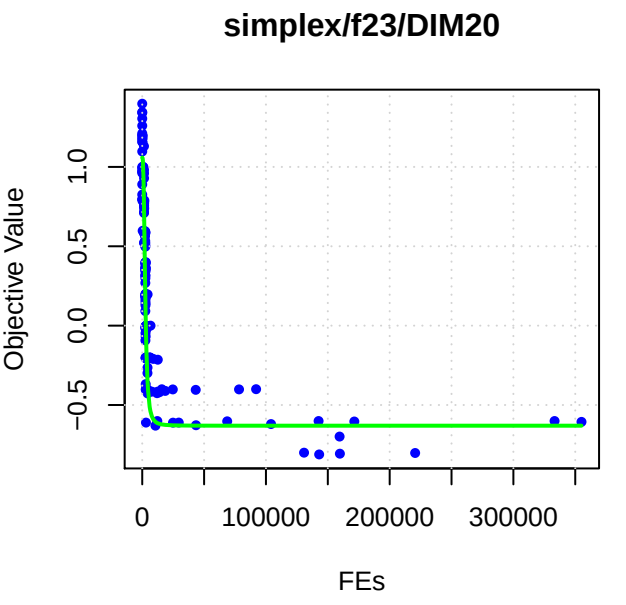
0
−2
−4
−6
−8
0
100
200
300
400
500
600


simplex/f23/DIM20
Objective Value
FEs
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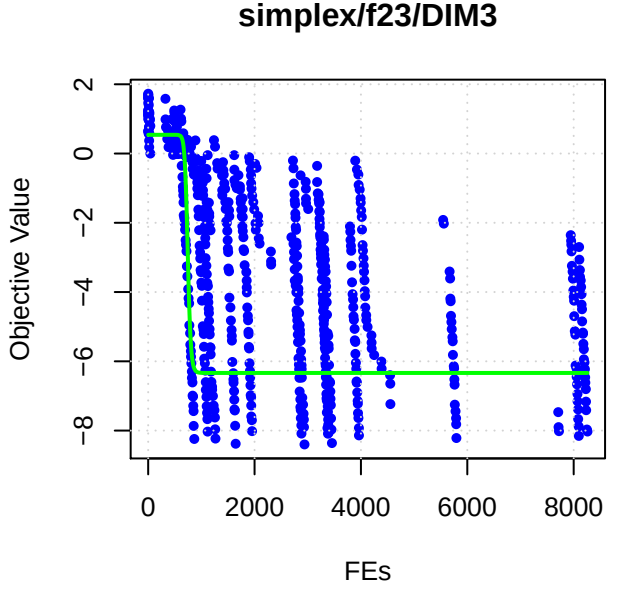
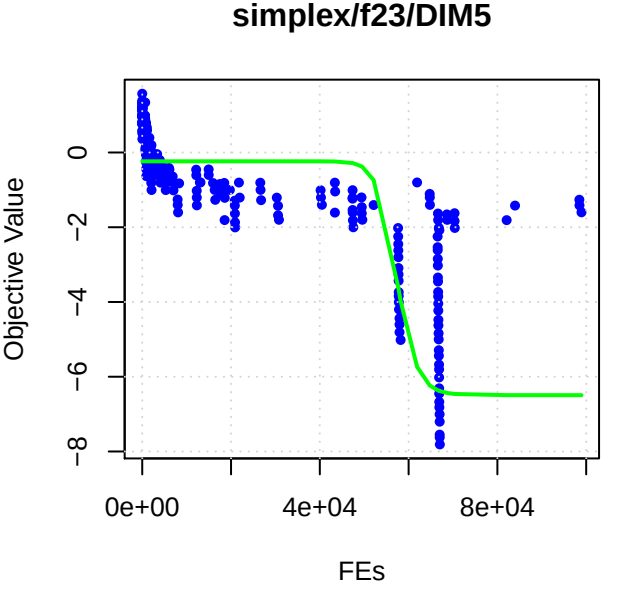
0.5
0.0
−0.5
0
100000
200000
300000


simplex/f23/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
2000
4000
6000
8000


simplex/f23/DIM5
Objective Value
FEs
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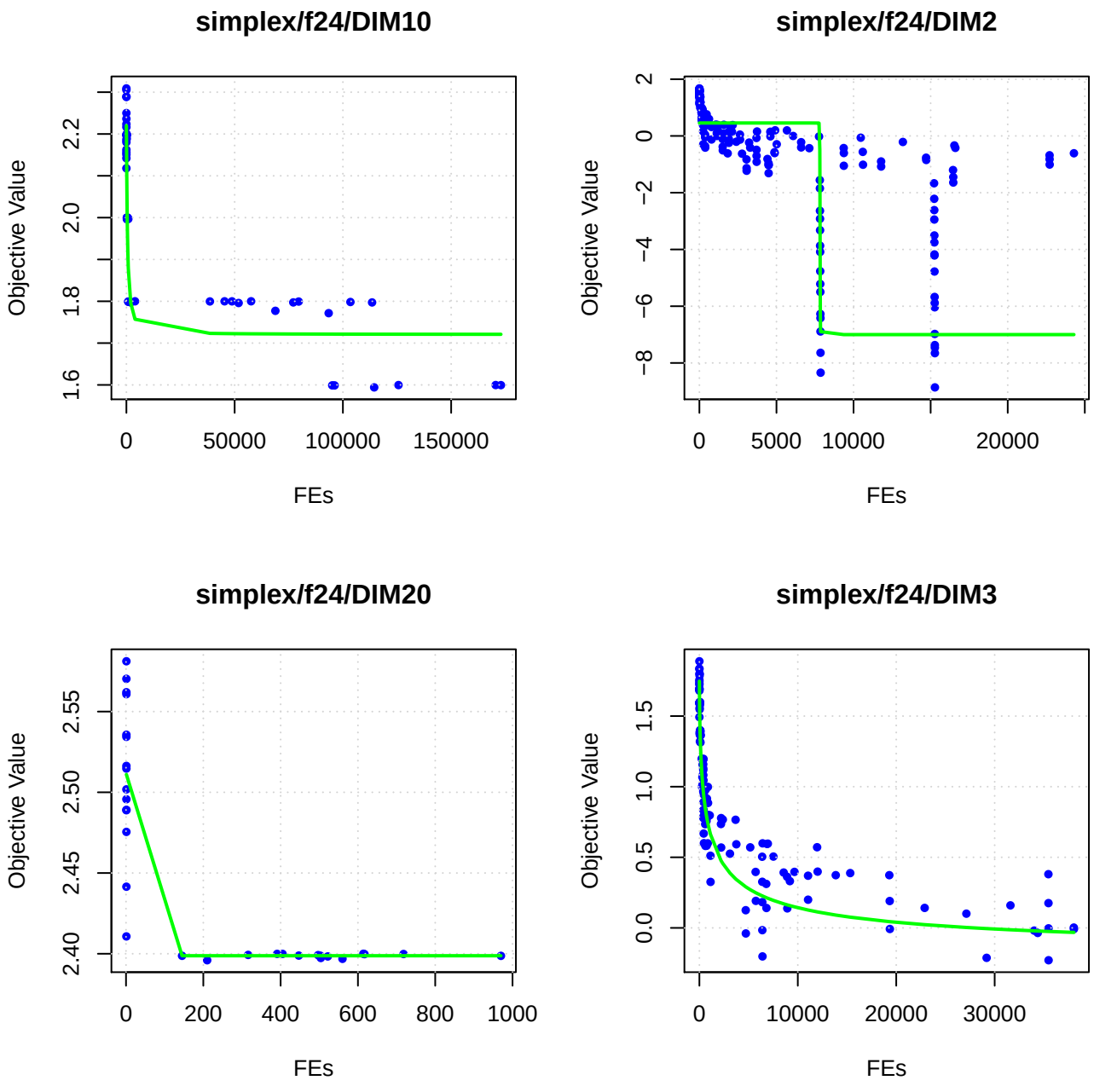
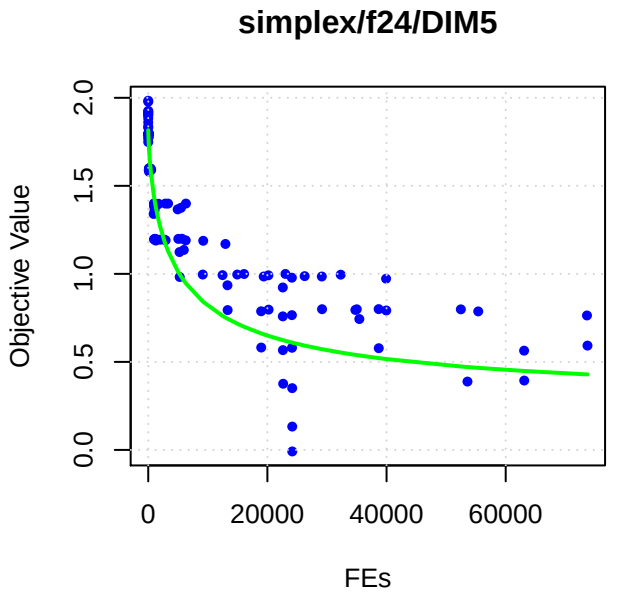
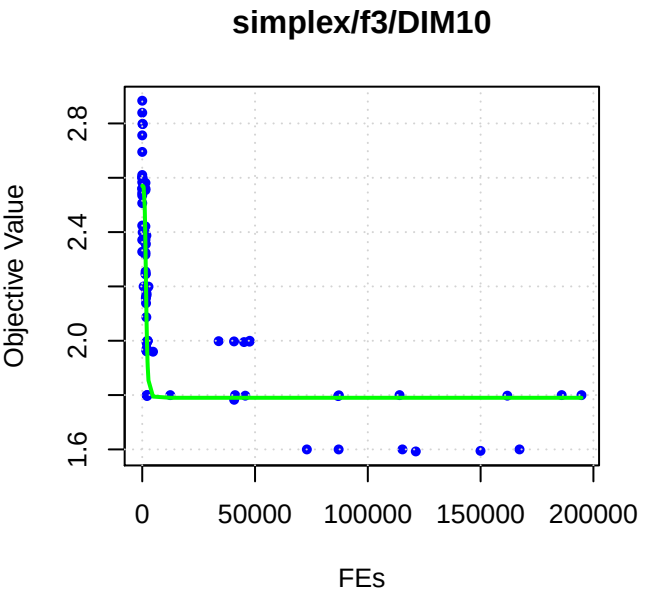
−2
−4
−6
−8
0e+00
4e+04
8e+04


simplex/f24/DIM10
Objective Value
1.6
1.8
2.0
2.2
0
50000
100000
150000
FEs
simplex/f24/DIM2
Objective Value
2
0
−2
−4
−6
−8
0
5000
10000
20000
FEs
simplex/f24/DIM20
Objective Value
2.40
2.45
2.50
2.55
0
200
400
600
800
1000
FEs
simplex/f24/DIM3
Objective Value
0.0
0.5
1.0
1.5
0
10000
20000
30000
FEs


simplex/f24/DIM5
Objective Value
0.0
0.5
1.0
1.5
2.0
0
20000
40000
60000
FEs


simplex/f3/DIM10
Objective Value
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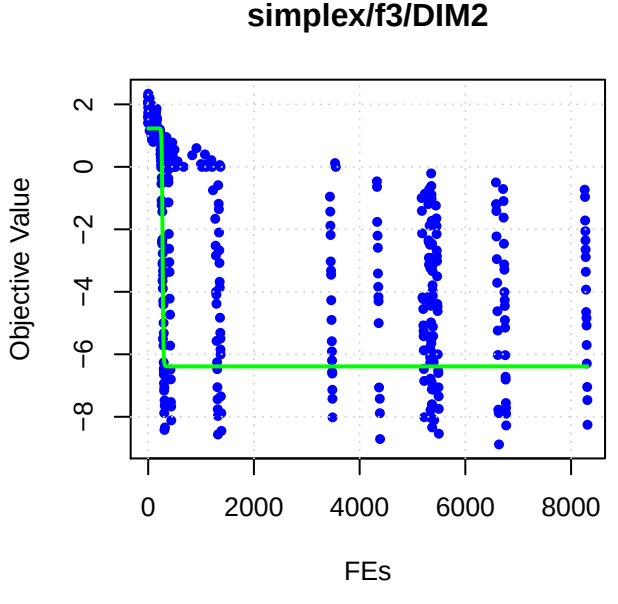
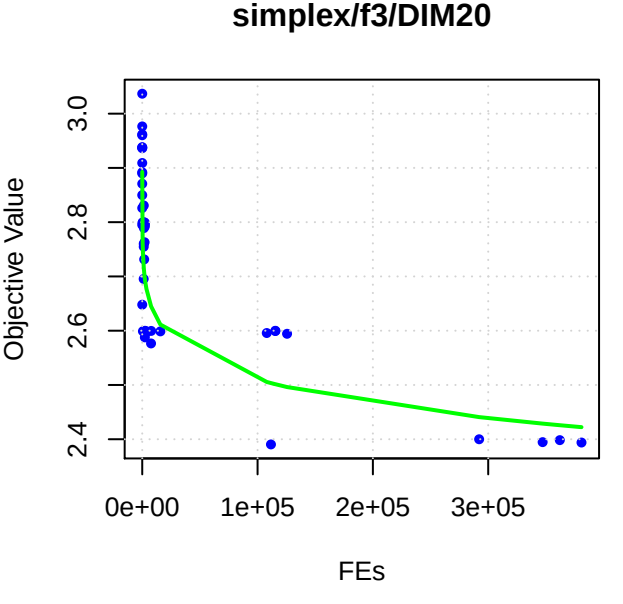
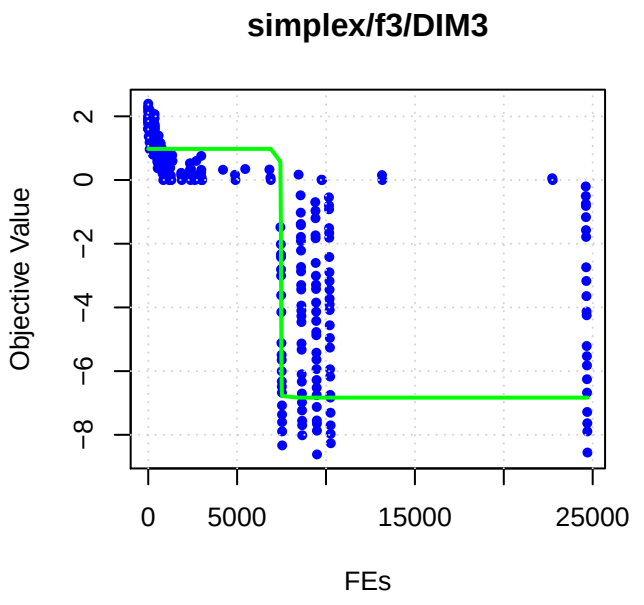
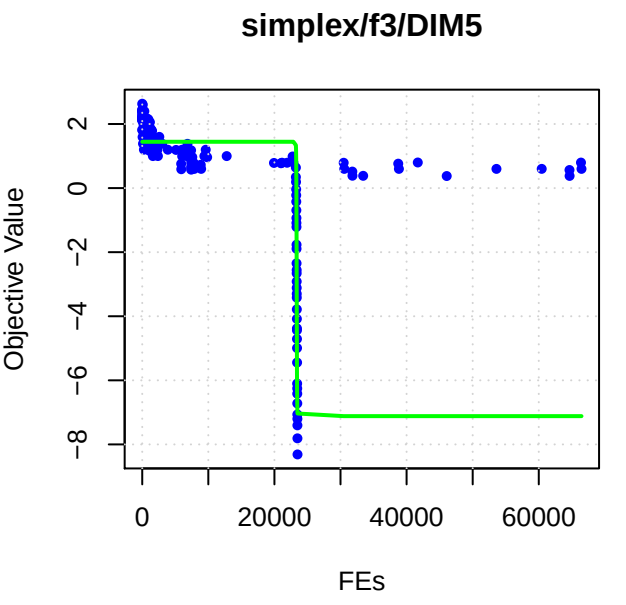
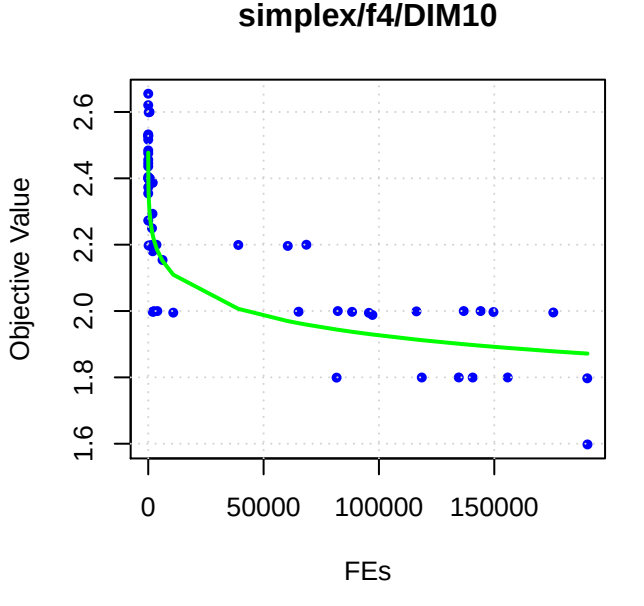
2.0
2.4
2.8
0
50000
100000
150000
200000
FEs

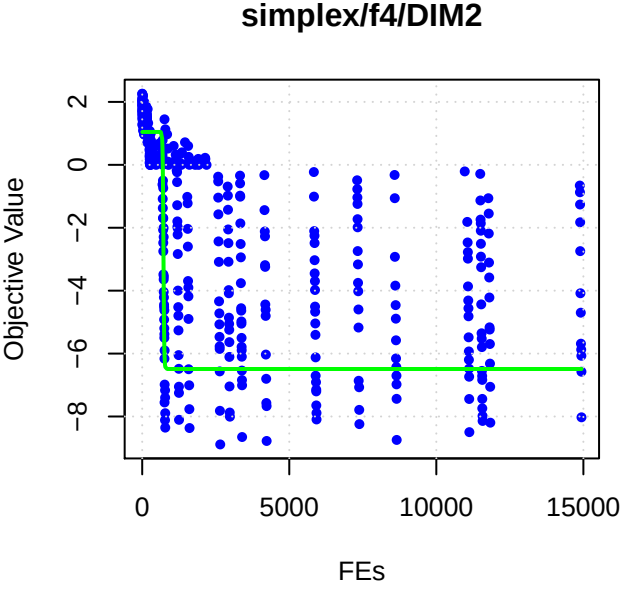

simplex/f3/DIM2
Objective Value
−8
−6
−4
−2
0
2
0
2000
4000
6000
8000
FEs

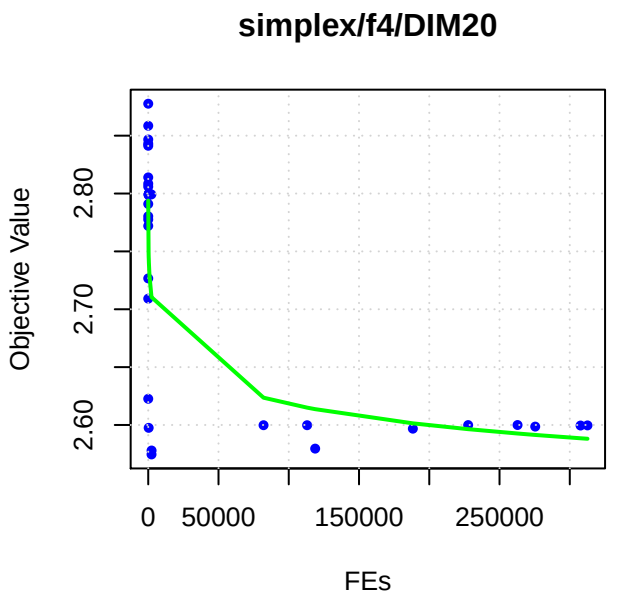

simplex/f3/DIM20
Objective Value
2.4
2.6
2.8
3.0
0e+00
1e+05
2e+05
3e+05
FEs

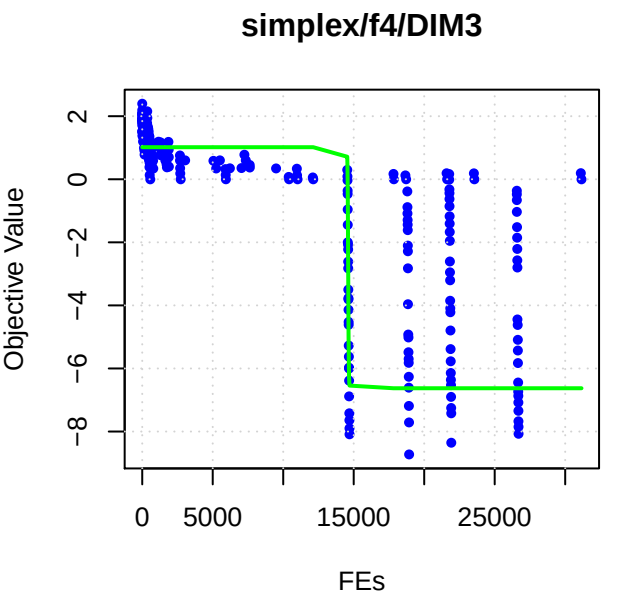

simplex/f3/DIM3
Objective Value
FEs
2
0
−2
−4
−6
−8
0
5000
15000
25000

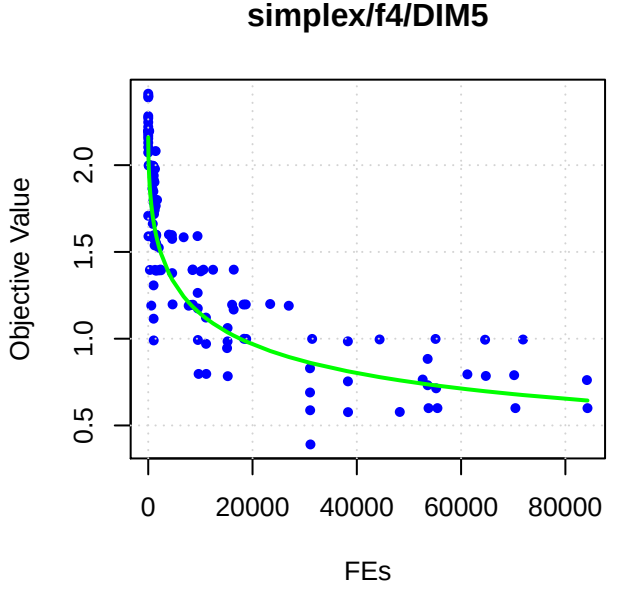

simplex/f3/DIM5
Objective Value
FEs
2
0
−2
−4
−6
−8
0
20000
40000
60000

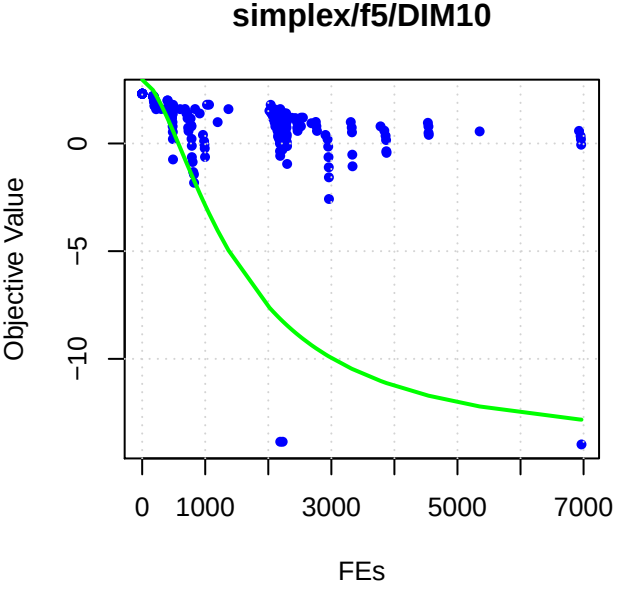

simplex/f4/DIM10
Objective Value
FEs
2.6
2.4
2.2
2.0
1.8
1.6
0
50000
100000
150000

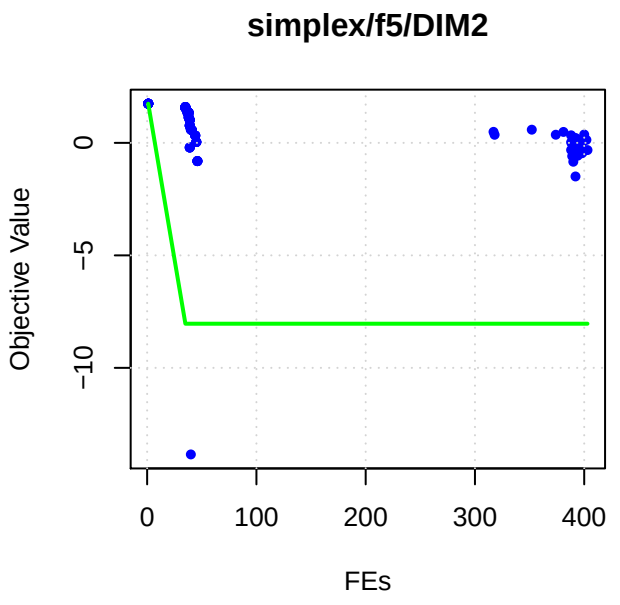

simplex/f4/DIM2
Objective Value
FEs
2
0
−2
−4
−6
−8
0
5000
10000
15000

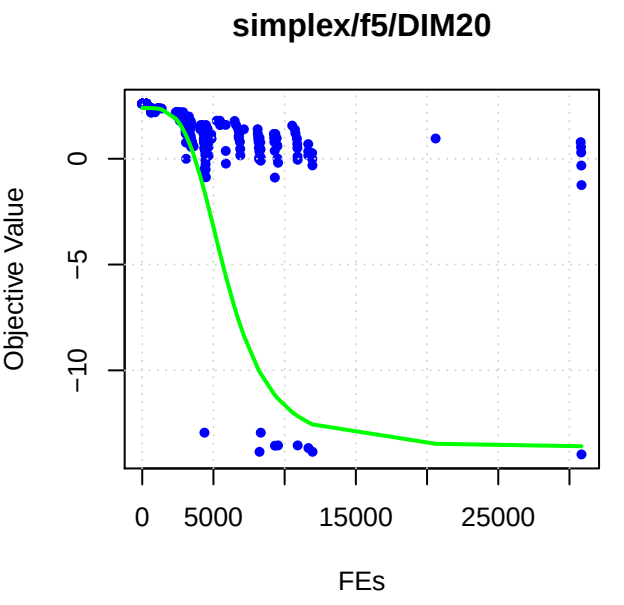

simplex/f4/DIM20
Objective Value
2.60
2.70
2.80
0
50000
150000
250000
FEs

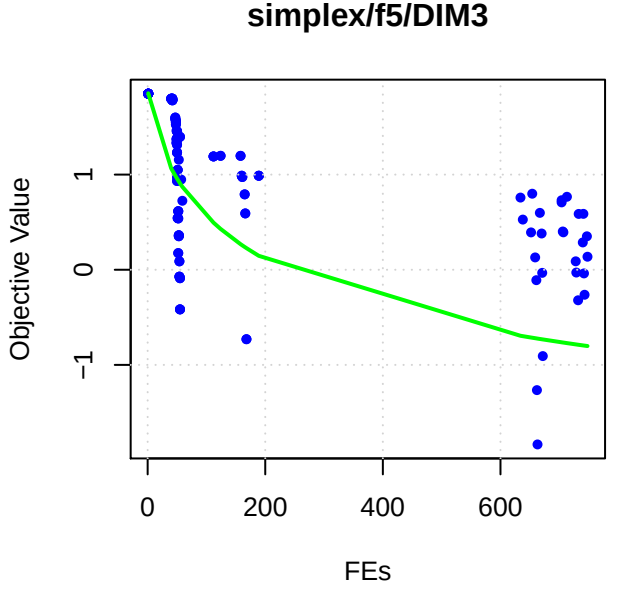

simplex/f4/DIM3
Objective Value
2
0
−2
−4
−6
−8
0
5000
15000
25000
FEs

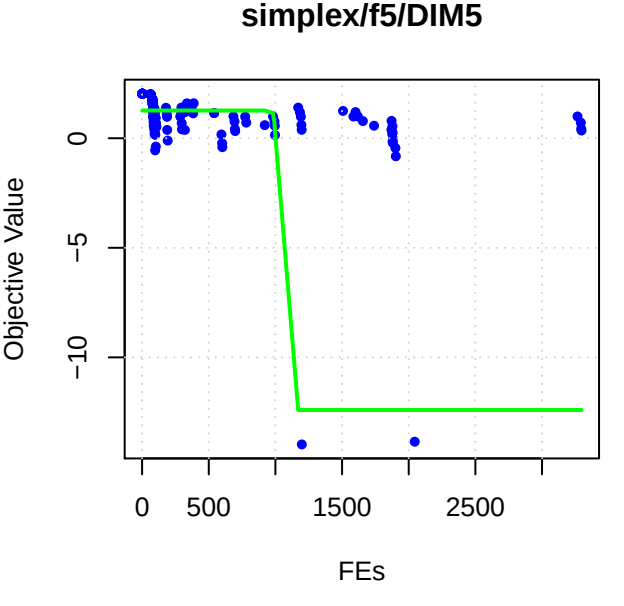

simplex/f4/DIM5
Objective Value
0.5
1.0
1.5
2.0
0
20000
40000
60000
80000
FEs

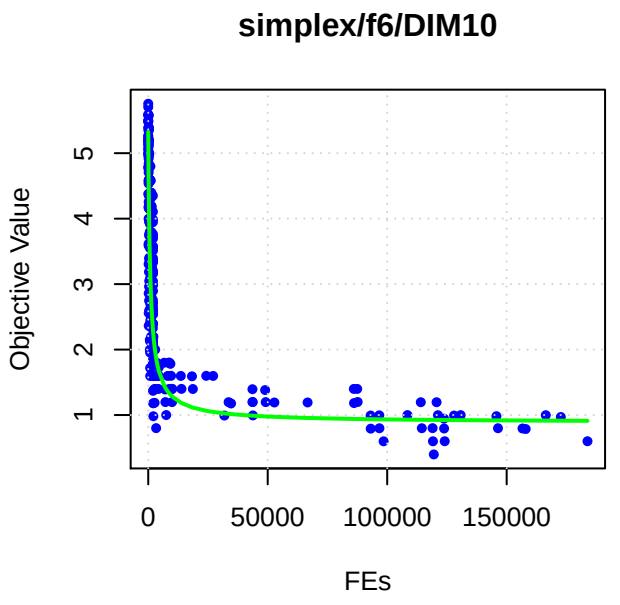

simplex/f5/DIM10
Objective Value
0
−5
−10
0
1000
3000
5000
7000
FEs

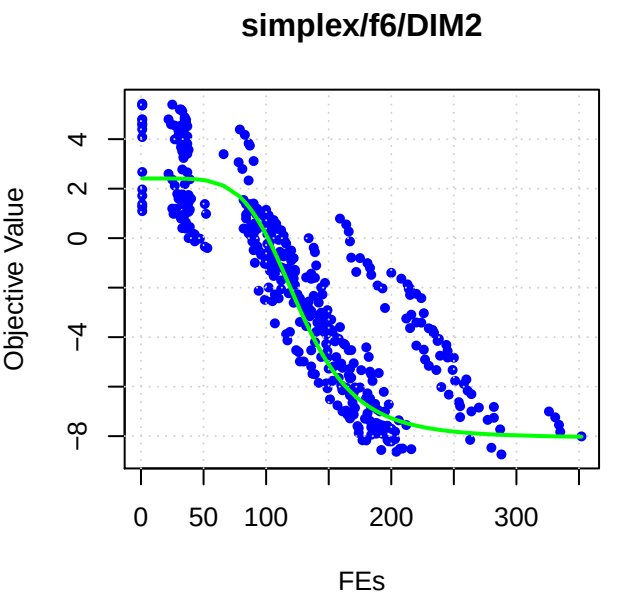

simplex/f5/DIM2
Objective Value
0
−5
−10
0
100
200
300
400
FEs

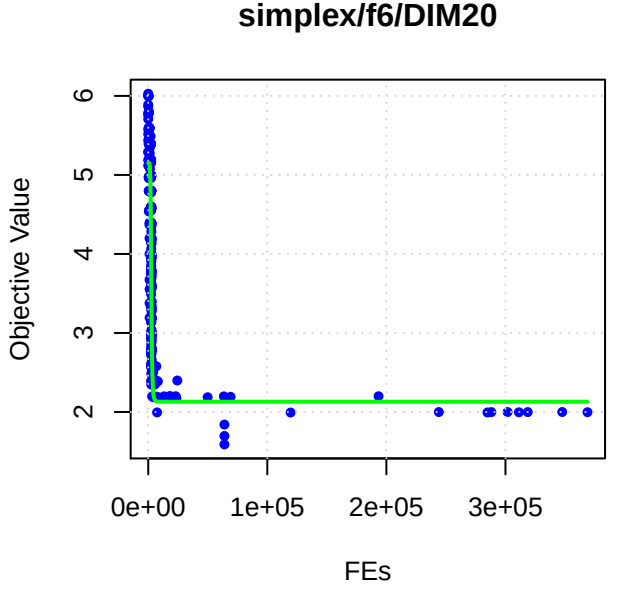

simplex/f5/DIM20
Objective Value
0
−5
−10
0
5000
15000
25000
FEs

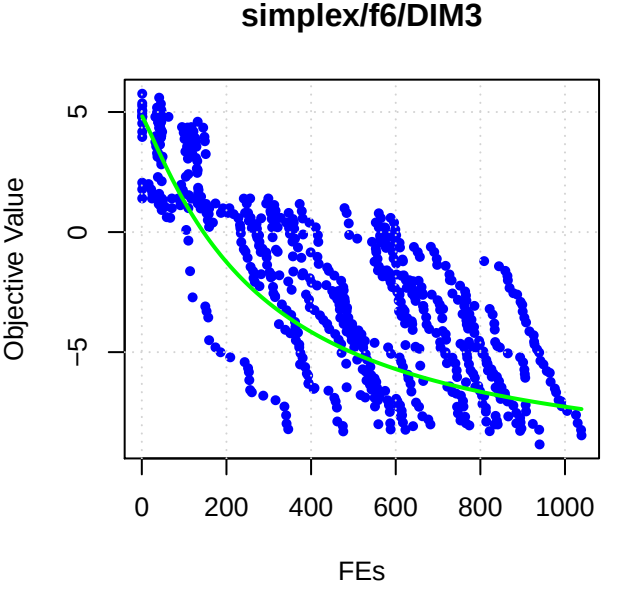

simplex/f5/DIM3
Objective Value
1
0
−1
0
200
400
600
FEs

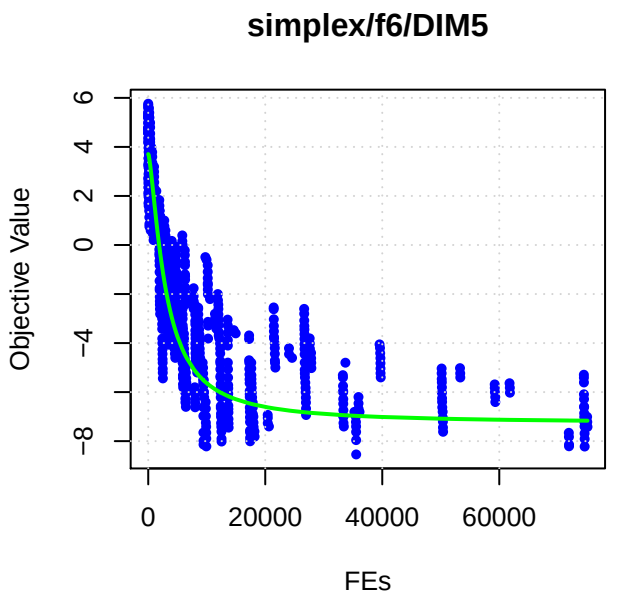

simplex/f5/DIM5
Objective Value
0
−5
−10
0
500
1500
2500
FEs

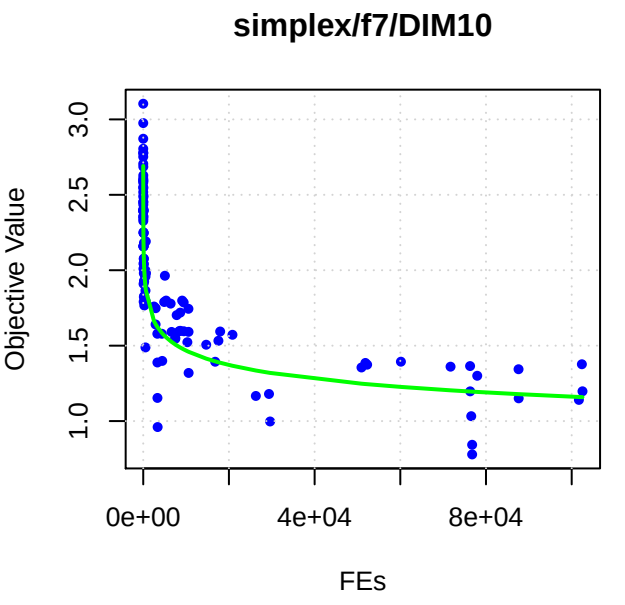

simplex/f6/DIM10
Objective Value
FEs
0
50000
100000
150000
1
2
3
4
5

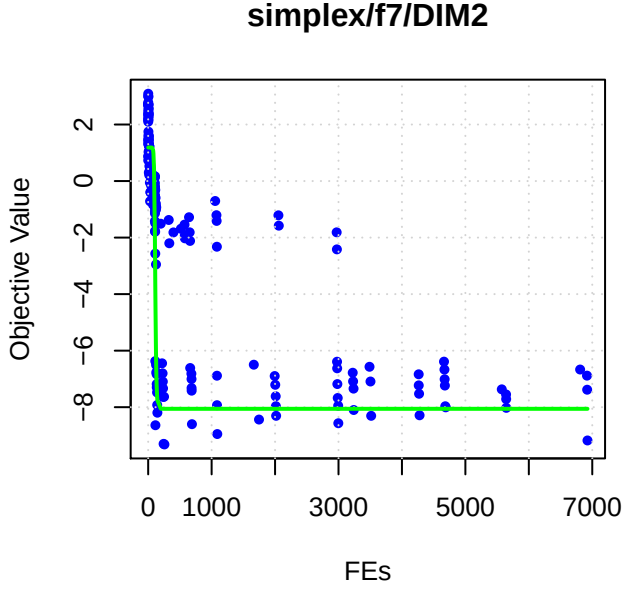

simplex/f6/DIM2
Objective Value
FEs
0
50
100
200
300
−8
−4
0
2
4

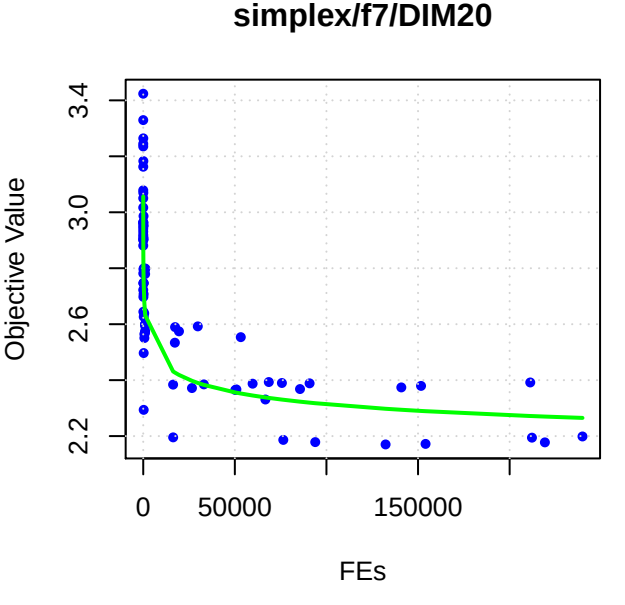

simplex/f6/DIM20
Objective Value
FEs
0e+00
1e+05
2e+05
3e+05
2
3
4
5
6

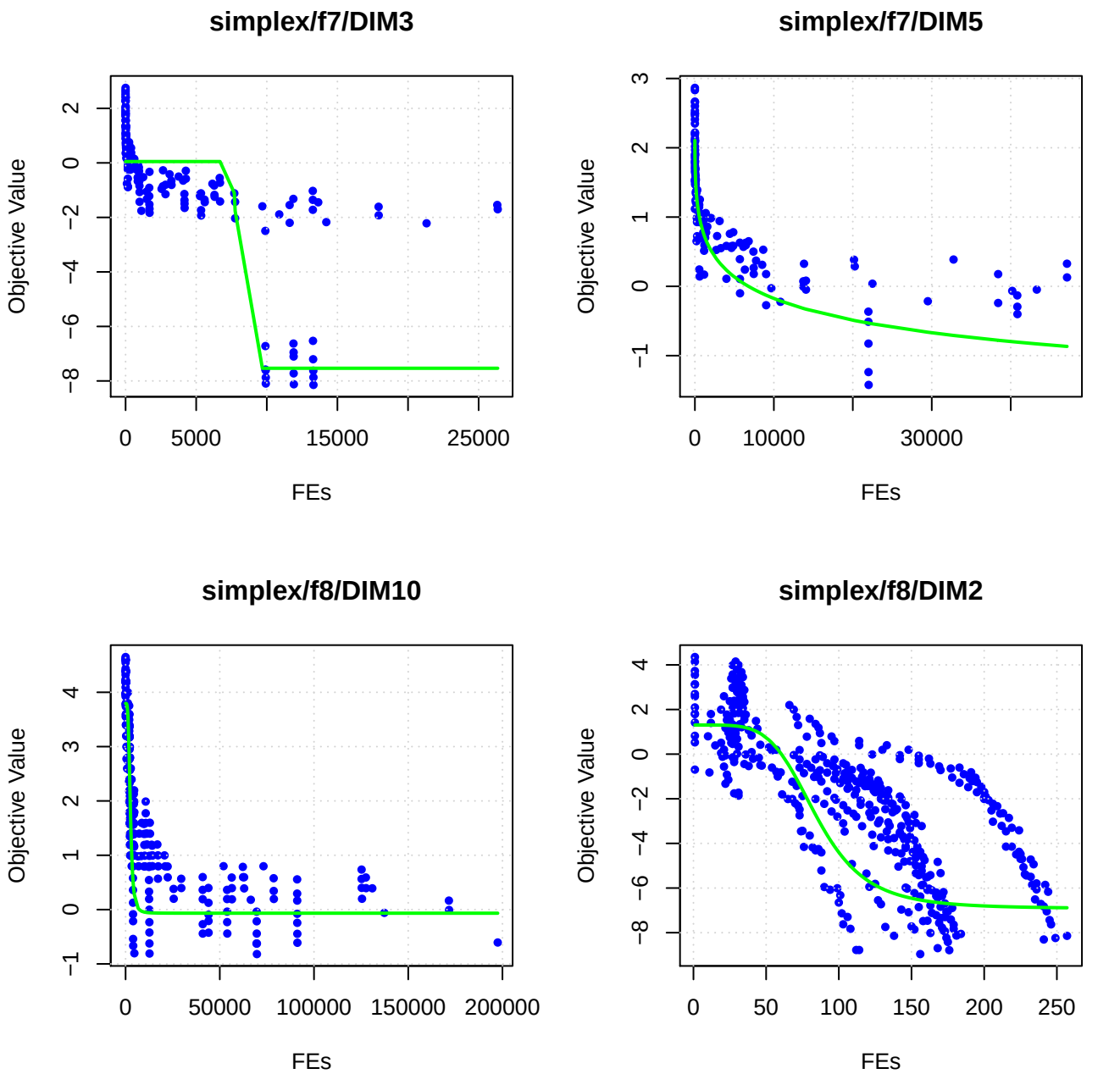

simplex/f6/DIM3
Objective Value
FEs
0
200
400
600
800
1000
−5
0
5

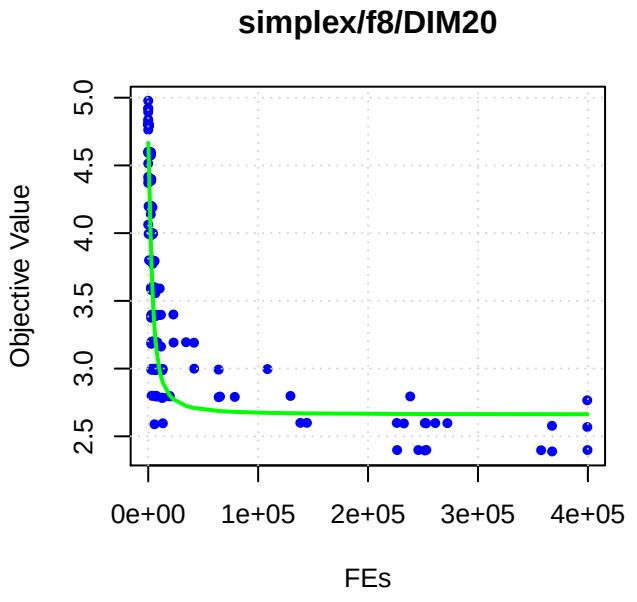

simplex/f6/DIM5
Objective Value
6
4
2
0
−4
−8
0
20000
40000
60000
FEs

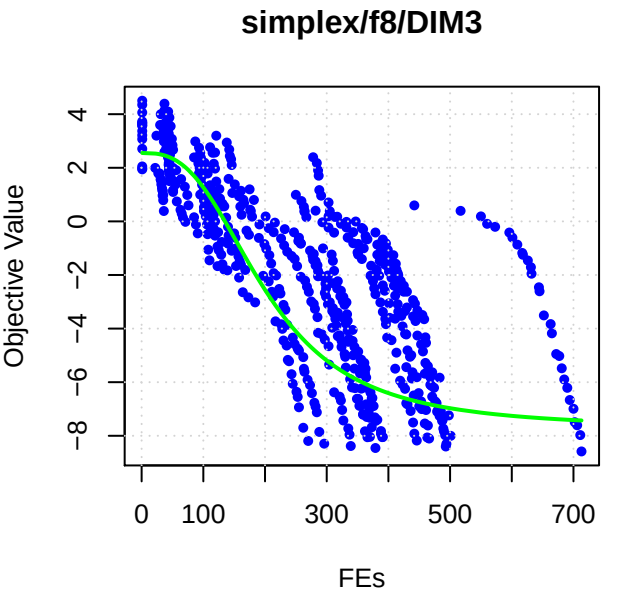

simplex/f7/DIM10
Objective Value
3.0
2.5
2.0
1.5
1.0
0e+00
4e+04
8e+04
FEs

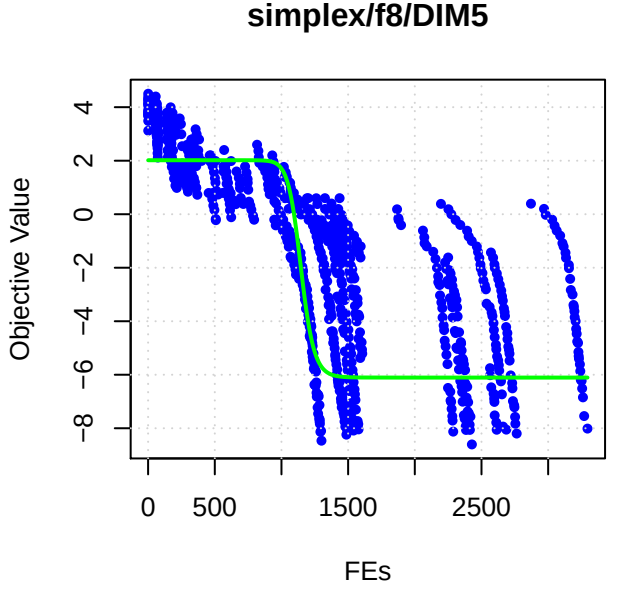

simplex/f7/DIM2
Objective Value
2
0
−2
−4
−6
−8
0
1000
3000
5000
7000
FEs

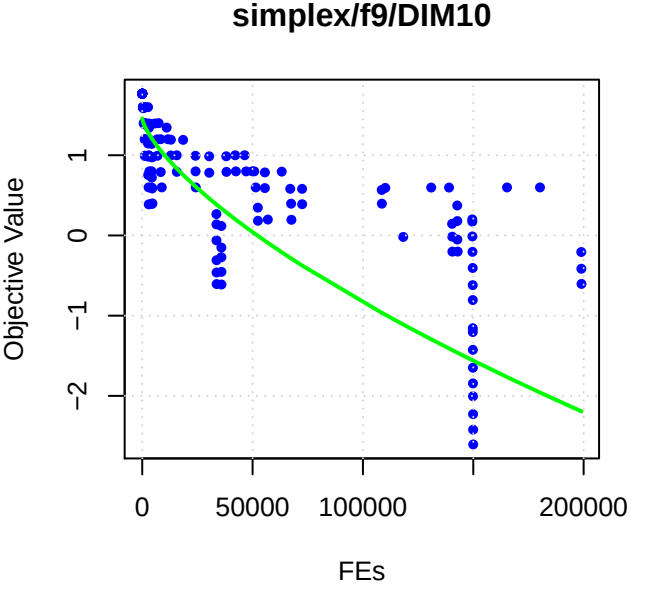

simplex/f7/DIM20
Objective Value
3.4
3.0
2.6
2.2
0
50000
150000
FEs


simplex/f7/DIM3
Objective Value
FEs
simplex/f7/DIM5
Objective Value
FEs
simplex/f8/DIM10
Objective Value
FEs
simplex/f8/DIM2
Objective Value
FEs


simplex/f8/DIM20
Objective Value
5.0
4.5
4.0
3.5
3.0
2.5
0e+00
1e+05
2e+05
3e+05
4e+05
FEs


simplex/f8/DIM3
Objective Value
4
2
0
−2
−4
−6
−8
0
100
300
500
700
FEs


simplex/f8/DIM5
Objective Value
4
2
0
−2
−4
−6
−8
0
500
1500
2500
FEs


simplex/f9/DIM10
Objective Value
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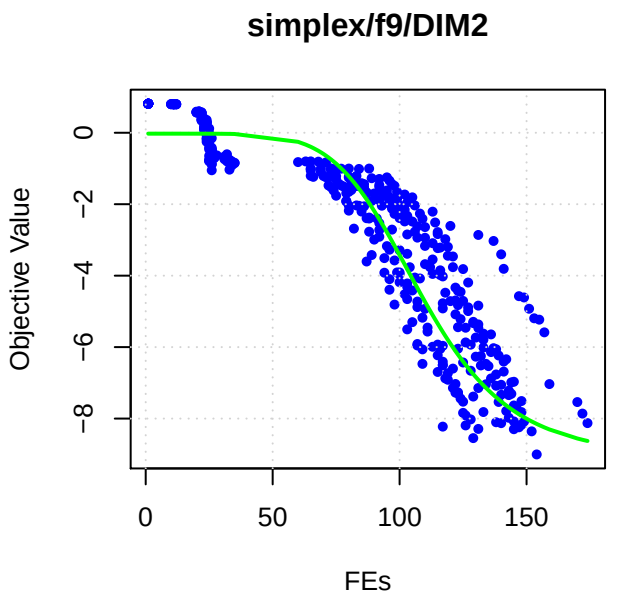
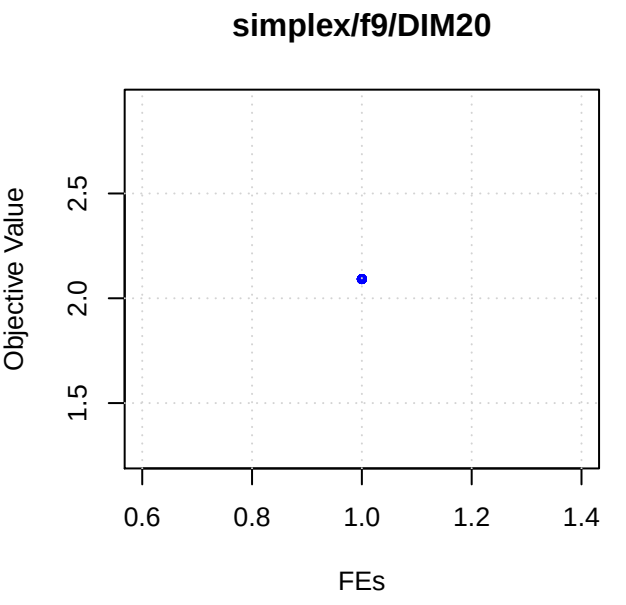
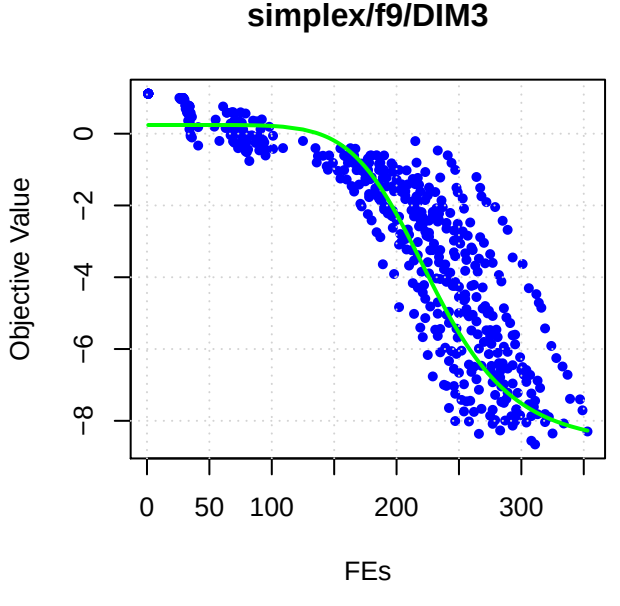
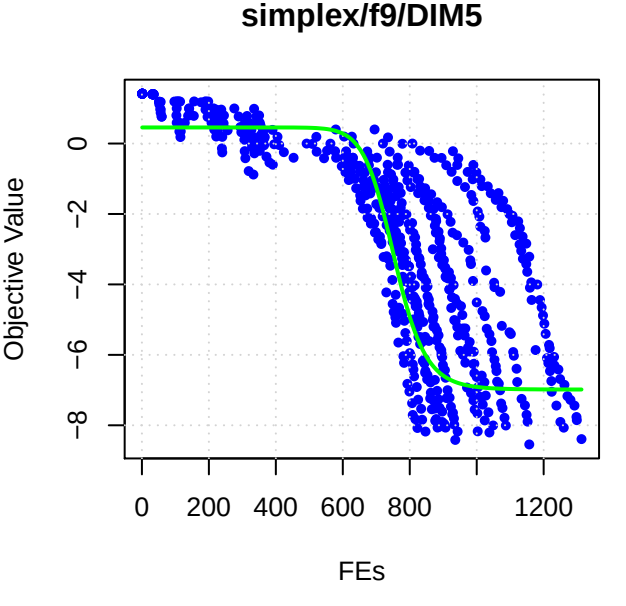
0
−1
−2
0
50000
100000
200000
FEs


simplex/f9/DIM2
Objective Value
0
−2
−4
−6
−8
0
50
100
150
FEs


simplex/f9/DIM20
Objective Value
2.5
2.0
1.5
0.6
0.8
1.0
1.2
1.4
FEs


simplex/f9/DIM3
Objective Value
0
−2
−4
−6
−8
0
50
100
200
300
FEs


simplex/f9/DIM5
Objective Value
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−2
−4
−6
−8
0
200
400
600
800
1200
FEs