HNCO
Evolution of entropy
in PBIL and UMDA

February 17, 2018

Contents

1 one-max **2**

2 lin **2**

3 leading-ones **3**

4 ridge **3**

5 jmp-5 **4**

6 jmp-10 **4**

7 djmp-5 **5**

8 djmp-10 **5**

9 fp-5 **6**

10 fp-10 **6**

11 nk **7**

12 max-sat **7**

13 labs **8**

14 ep **8**

15 cancel **9**

16 trap **9**

17 hiff **10**

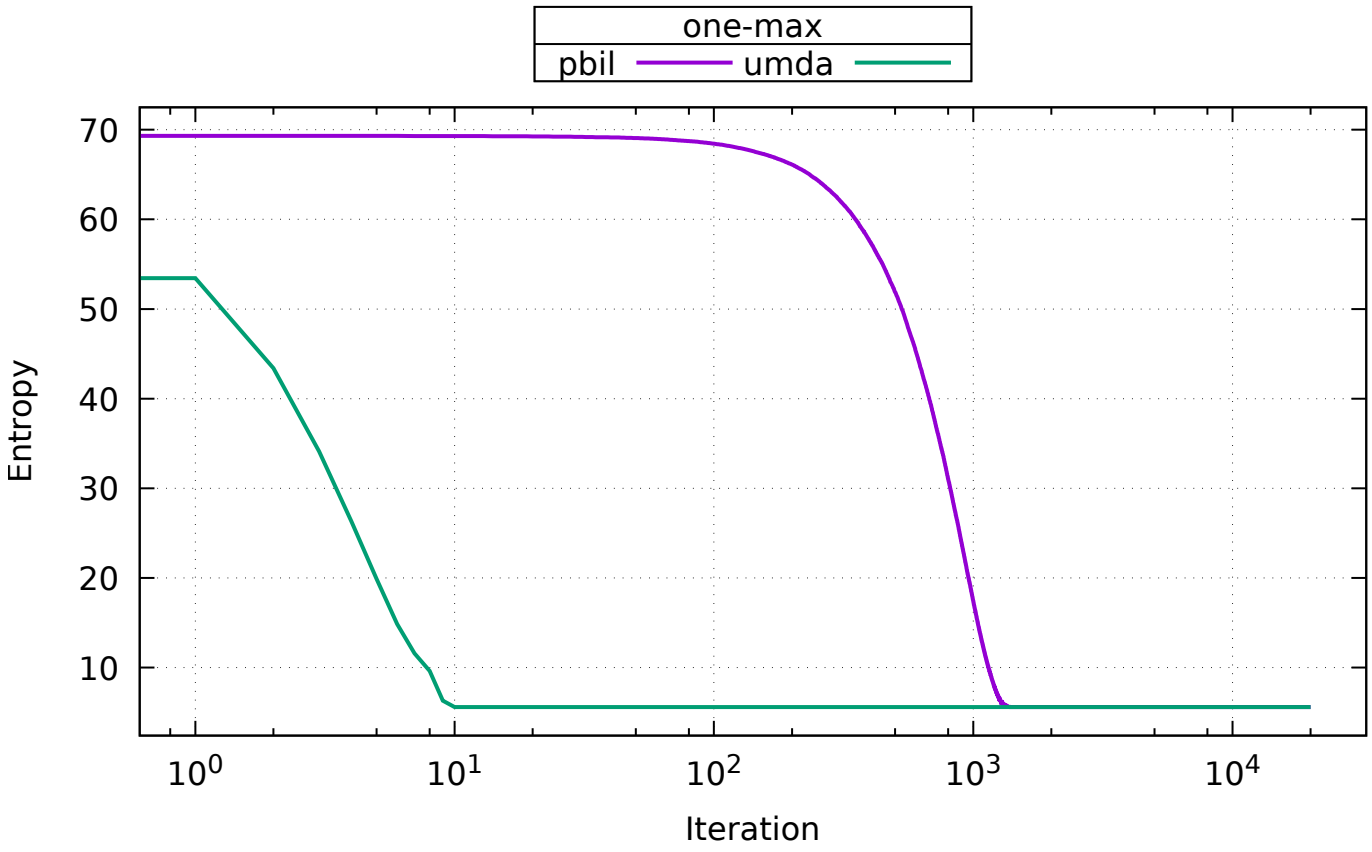
18 plateau **10**

19 walsh2 **11**

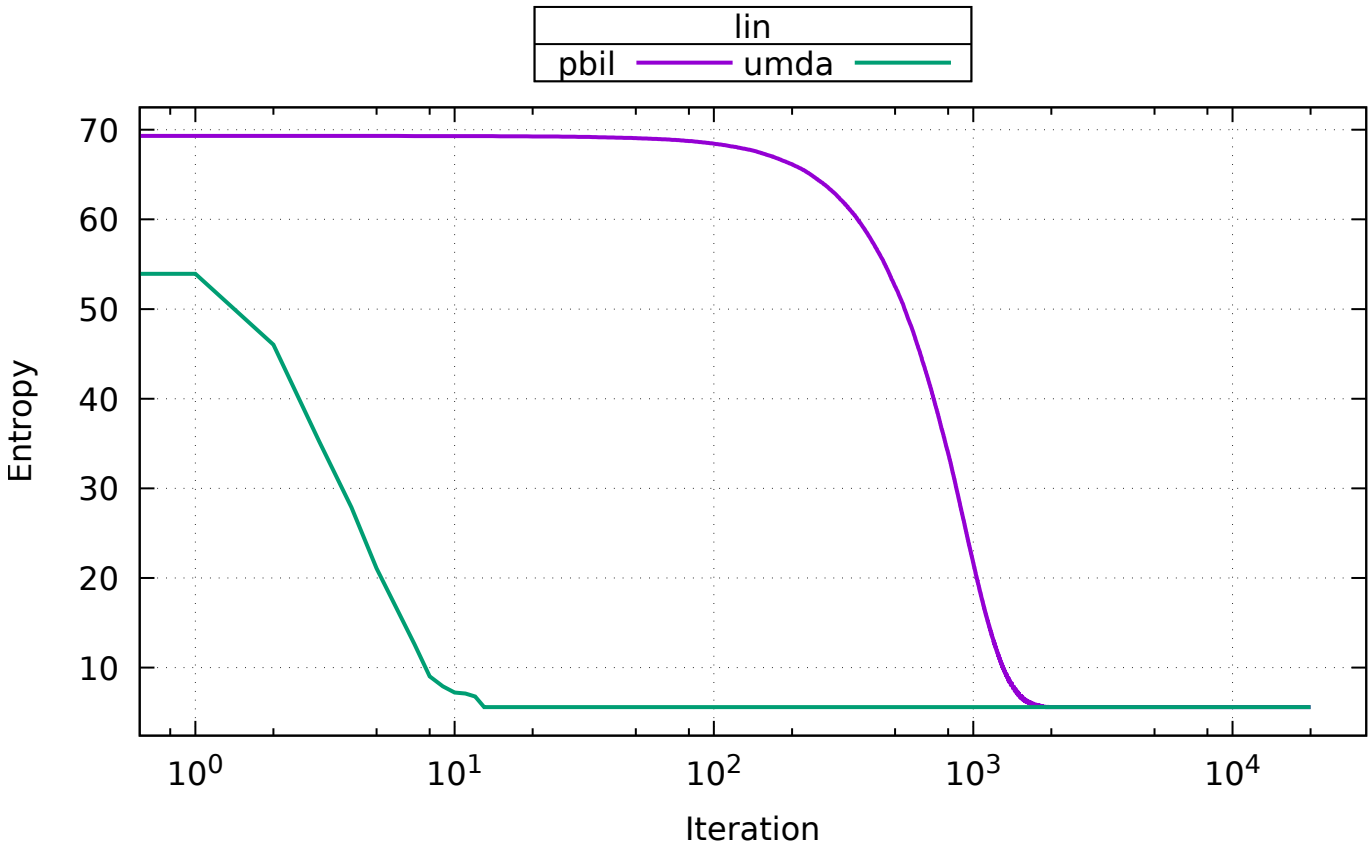
A Plan **11**

B Default parameters **13**

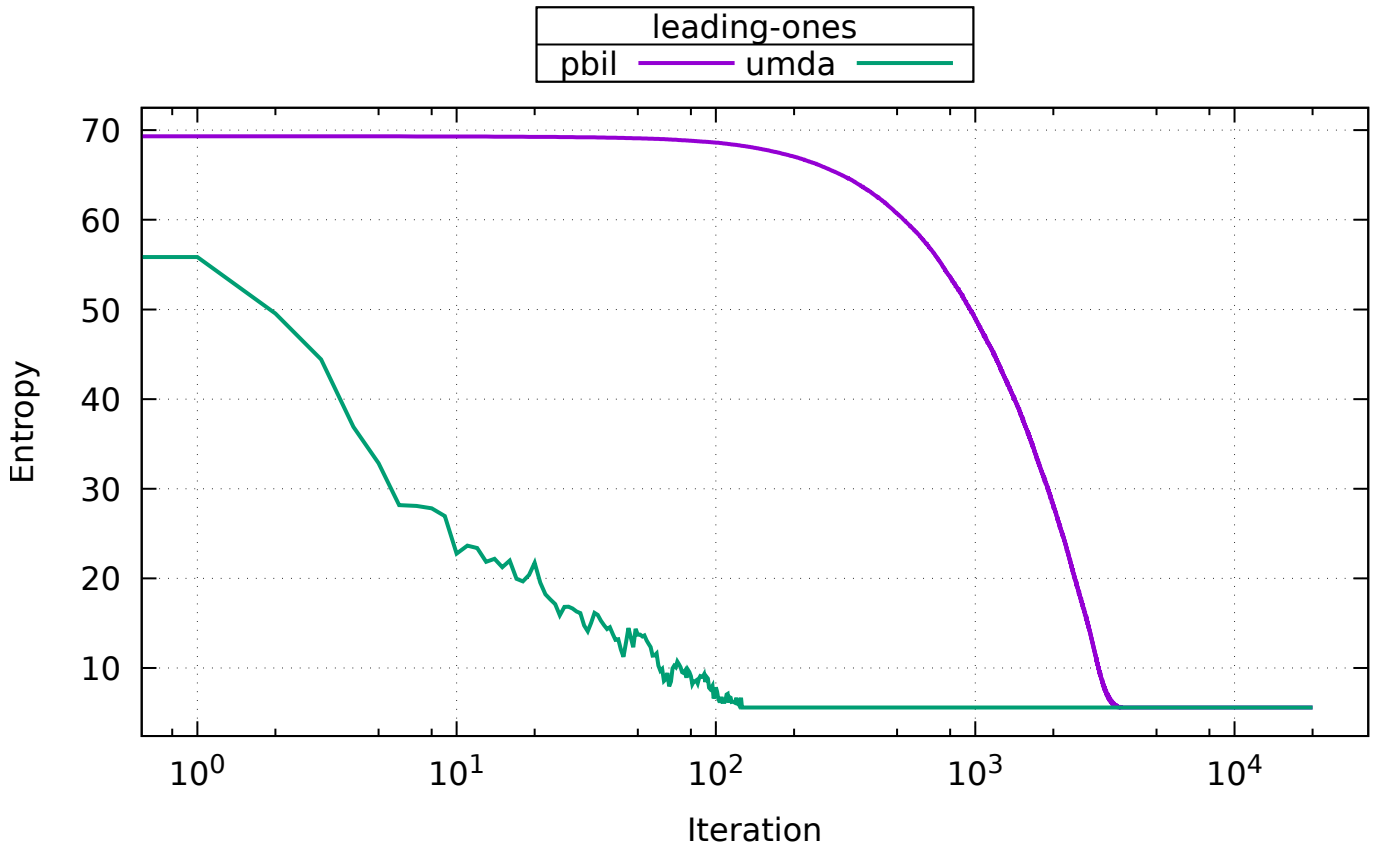
1 one-max



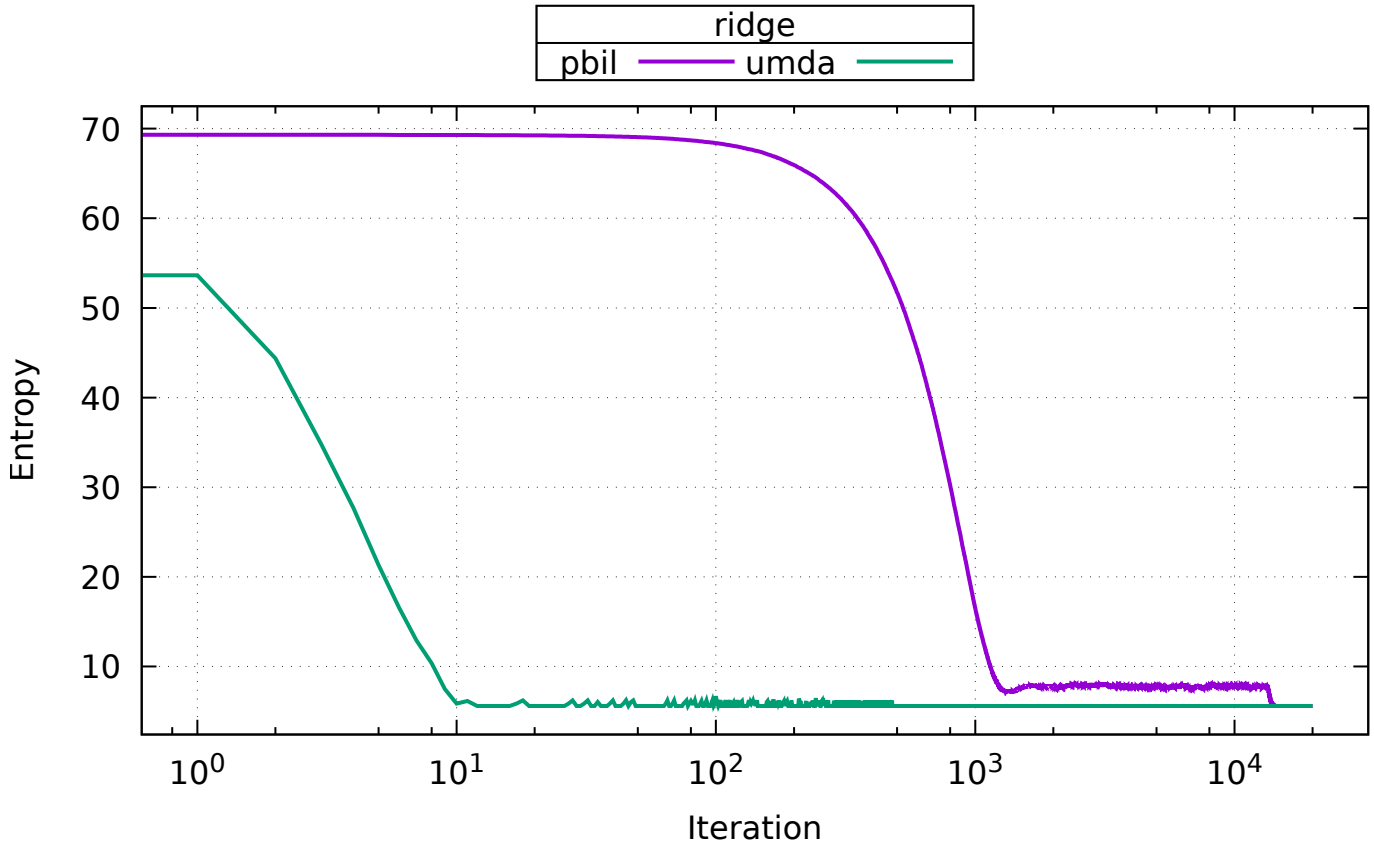
2 lin



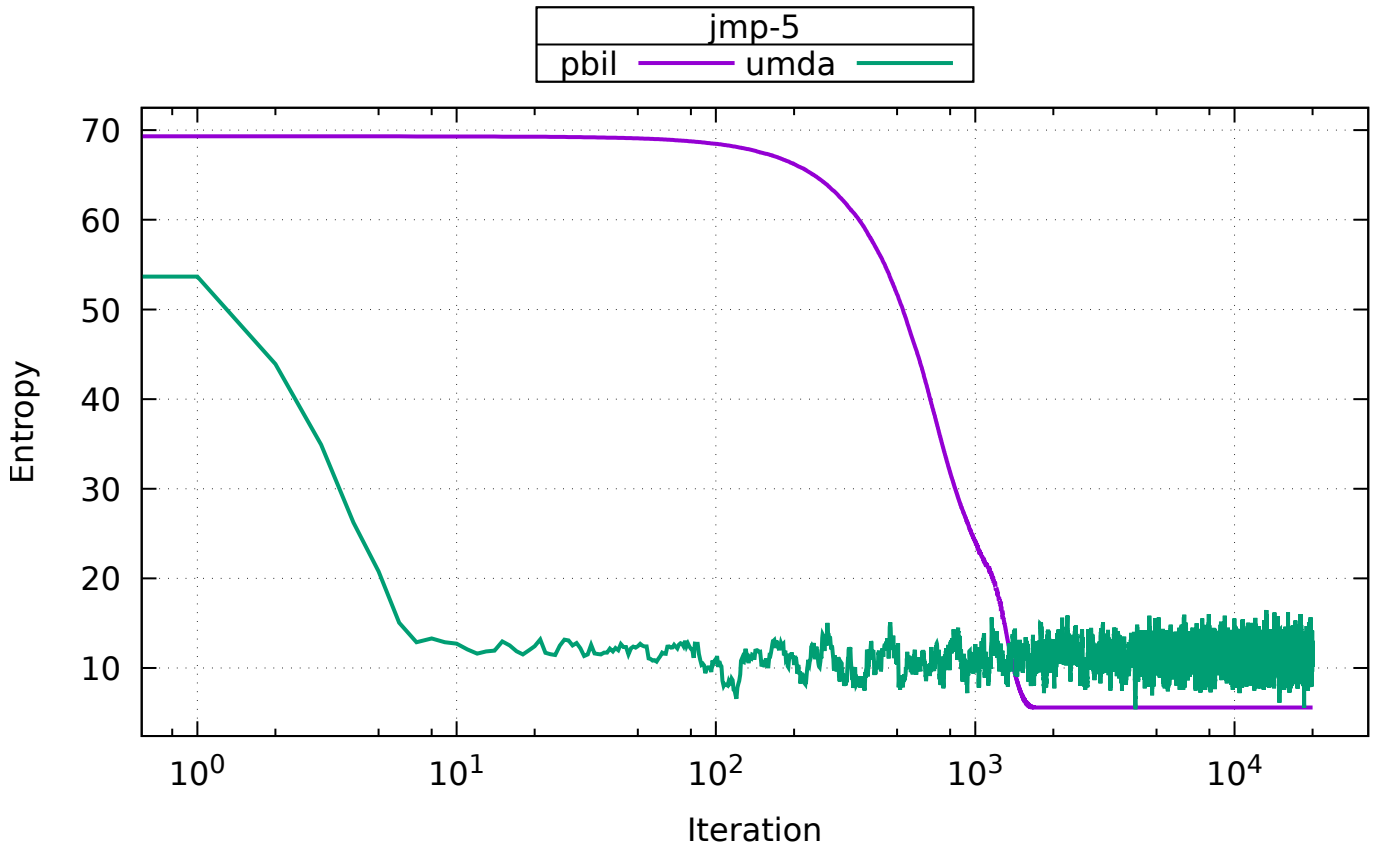
3 leading-ones



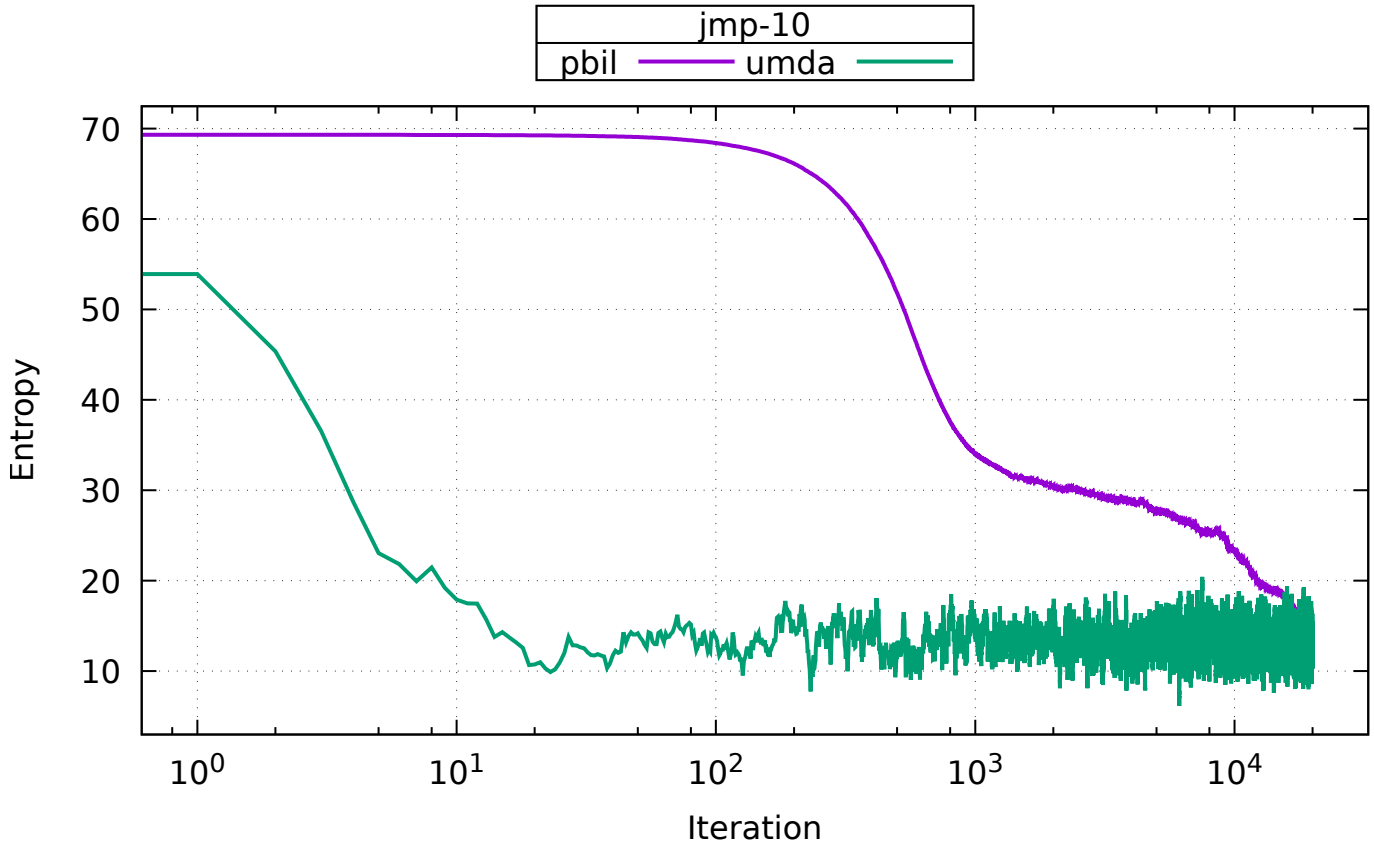
4 ridge



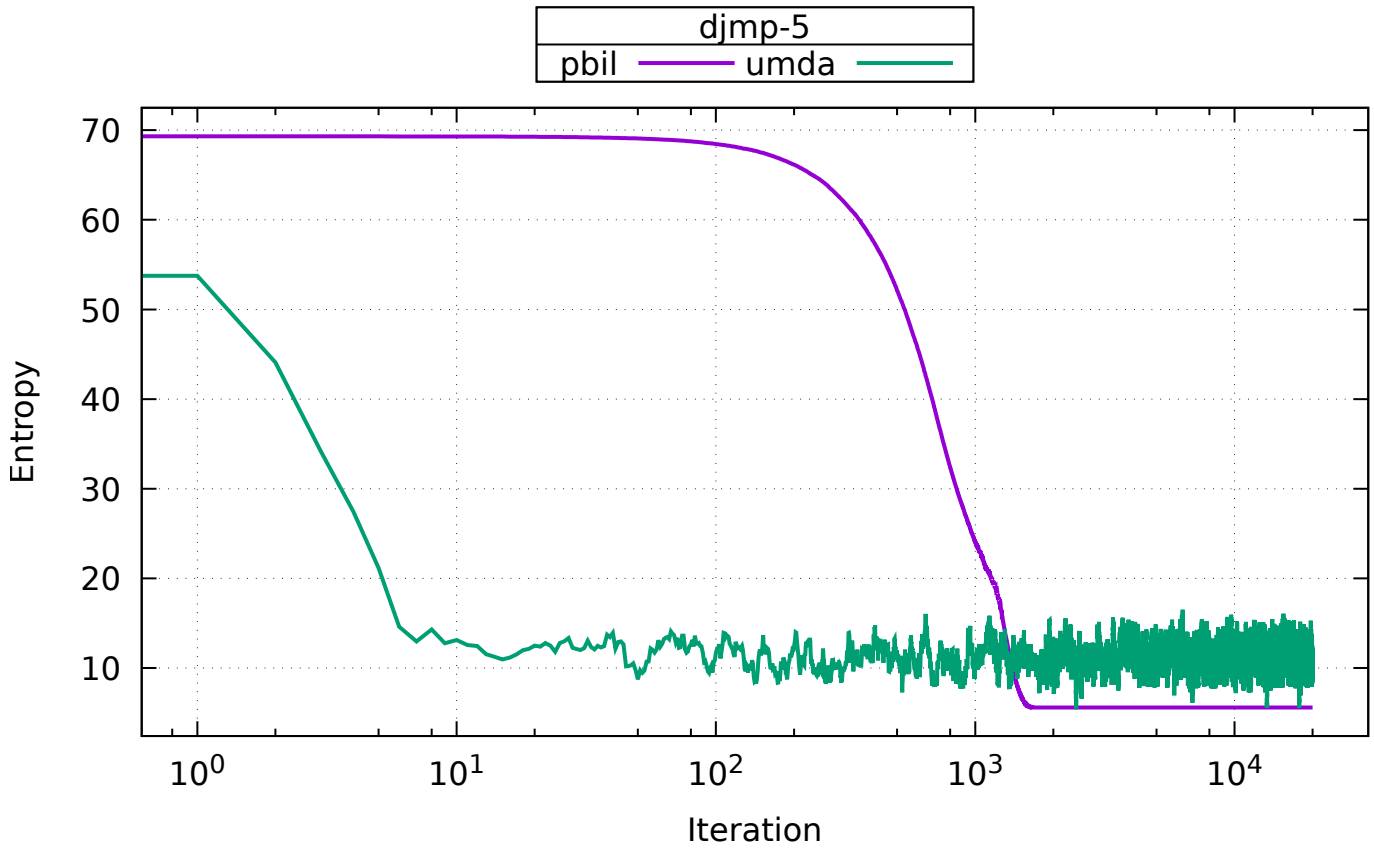
5 jmp-5



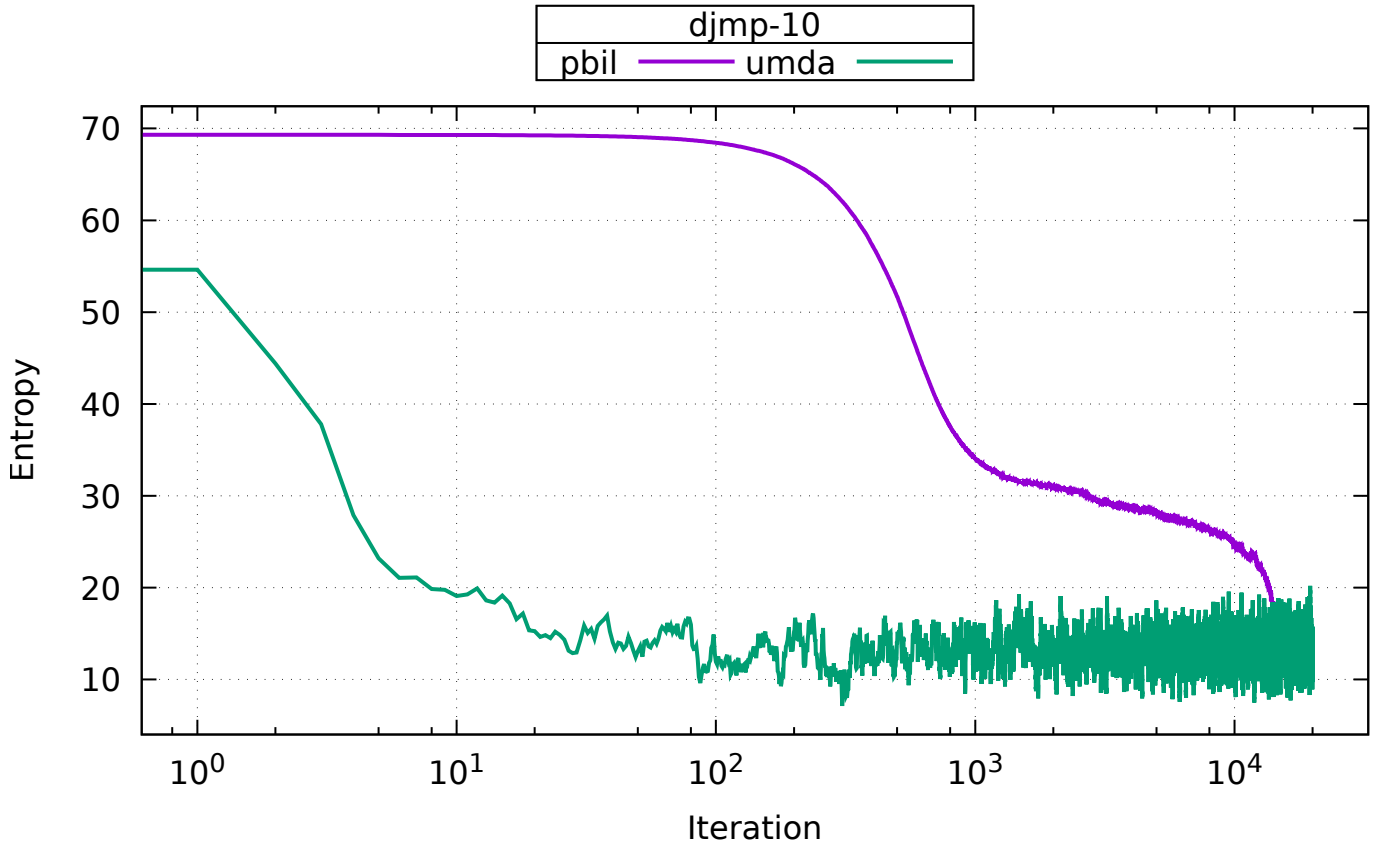
6 jmp-10



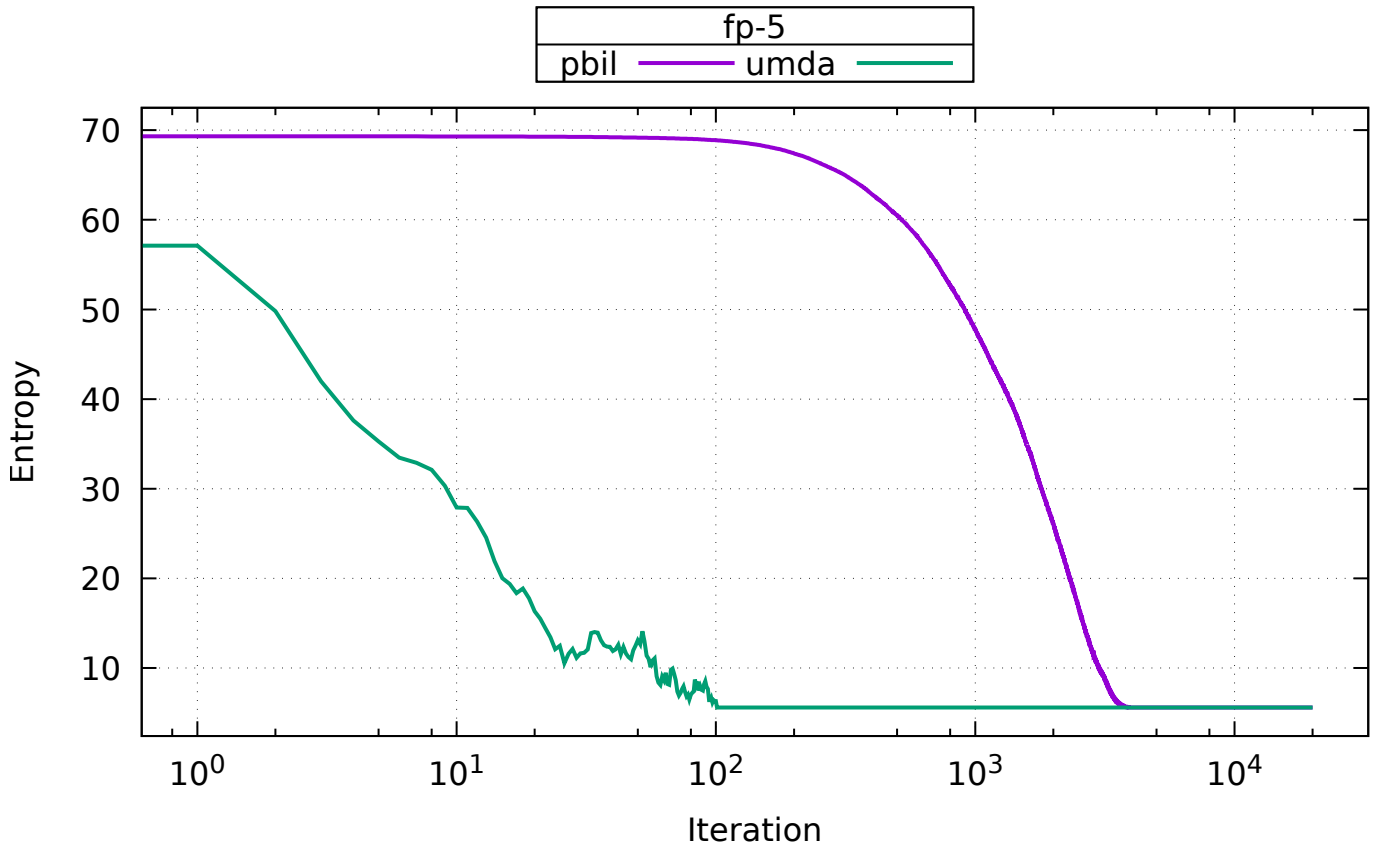
7 djmp-5



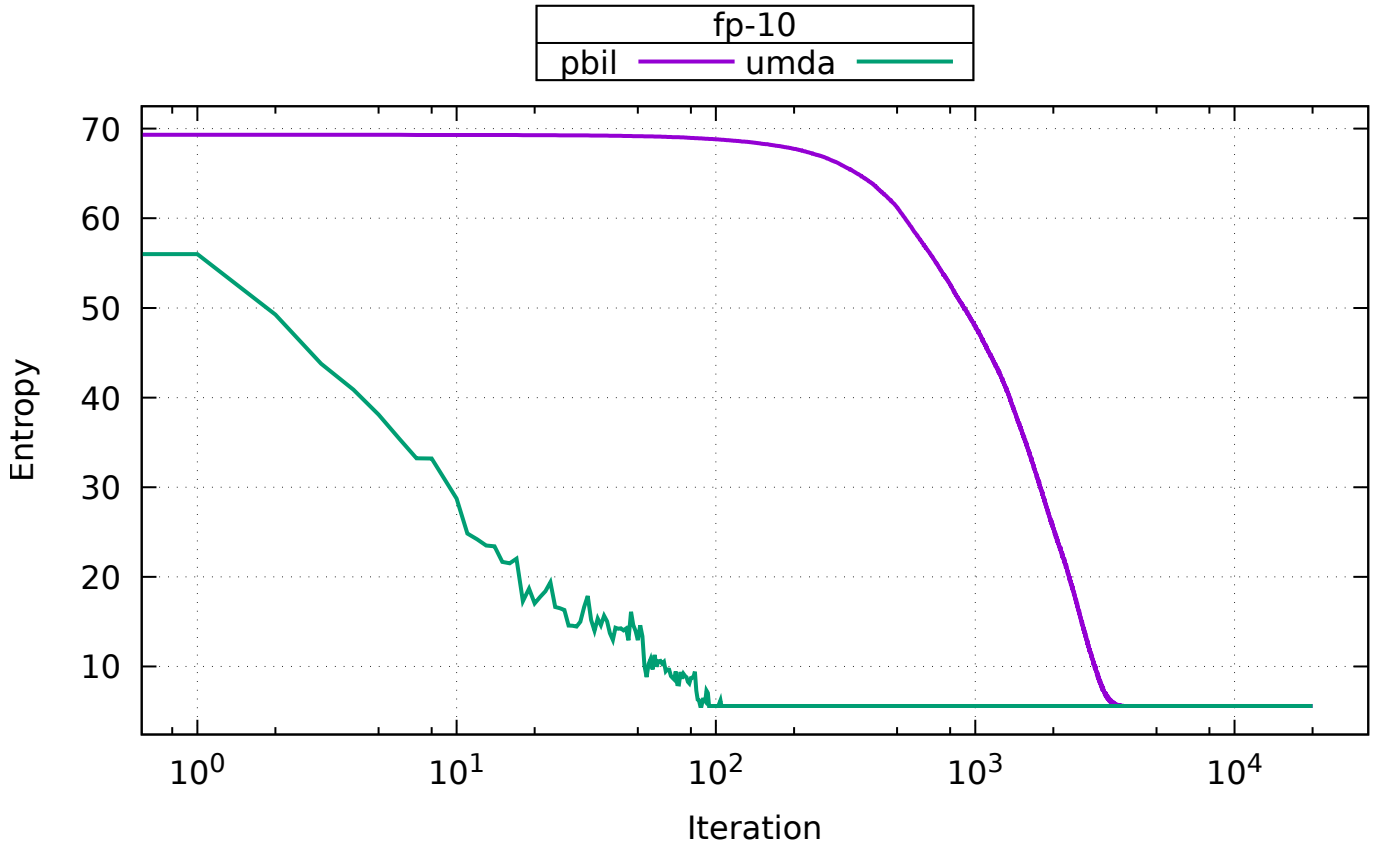
8 djmp-10



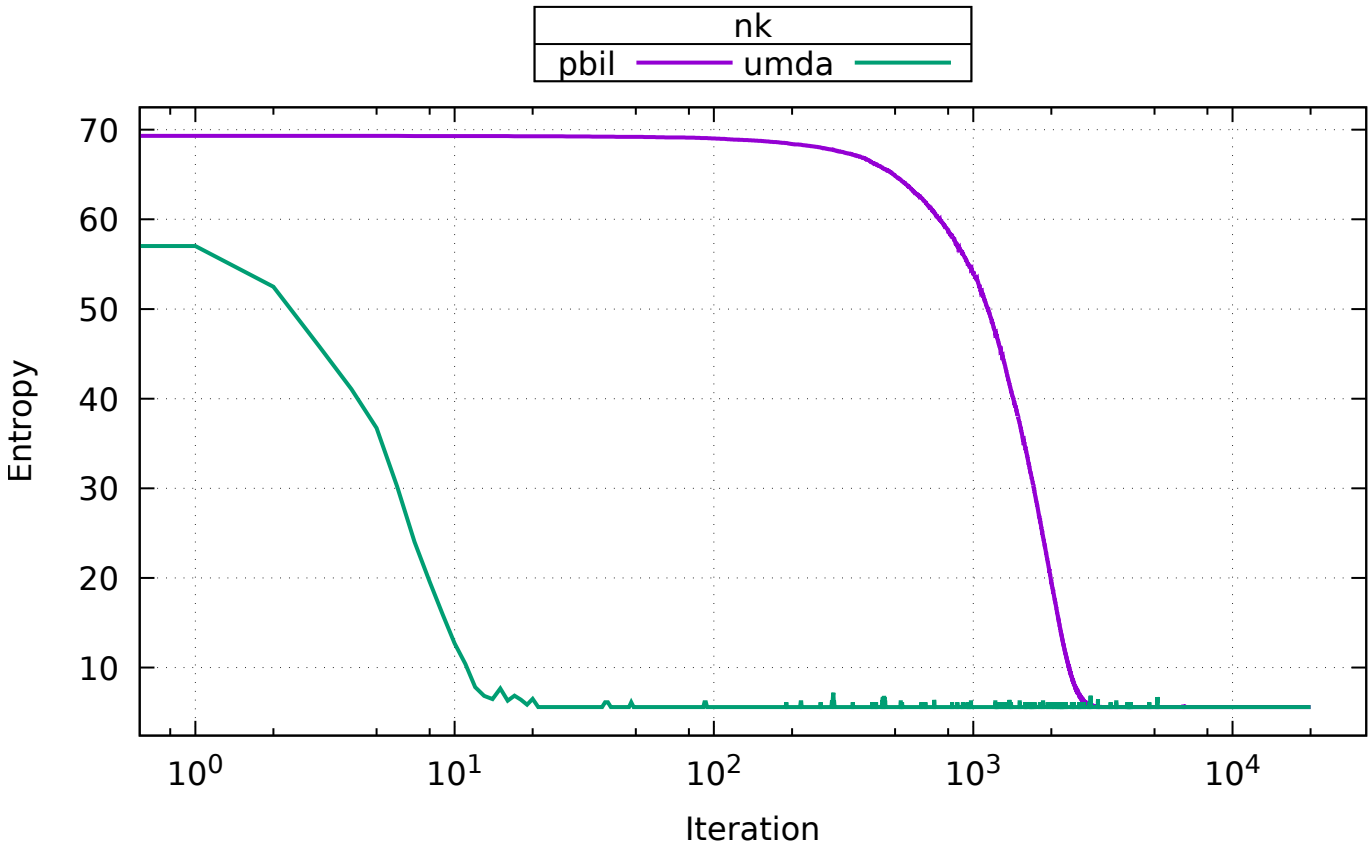
9 fp-5


fp-5
pbil
umda
Entropy
Iteration
70
60
50
40
30
20
10
10^0
10^1
10^2
10^3
10^4

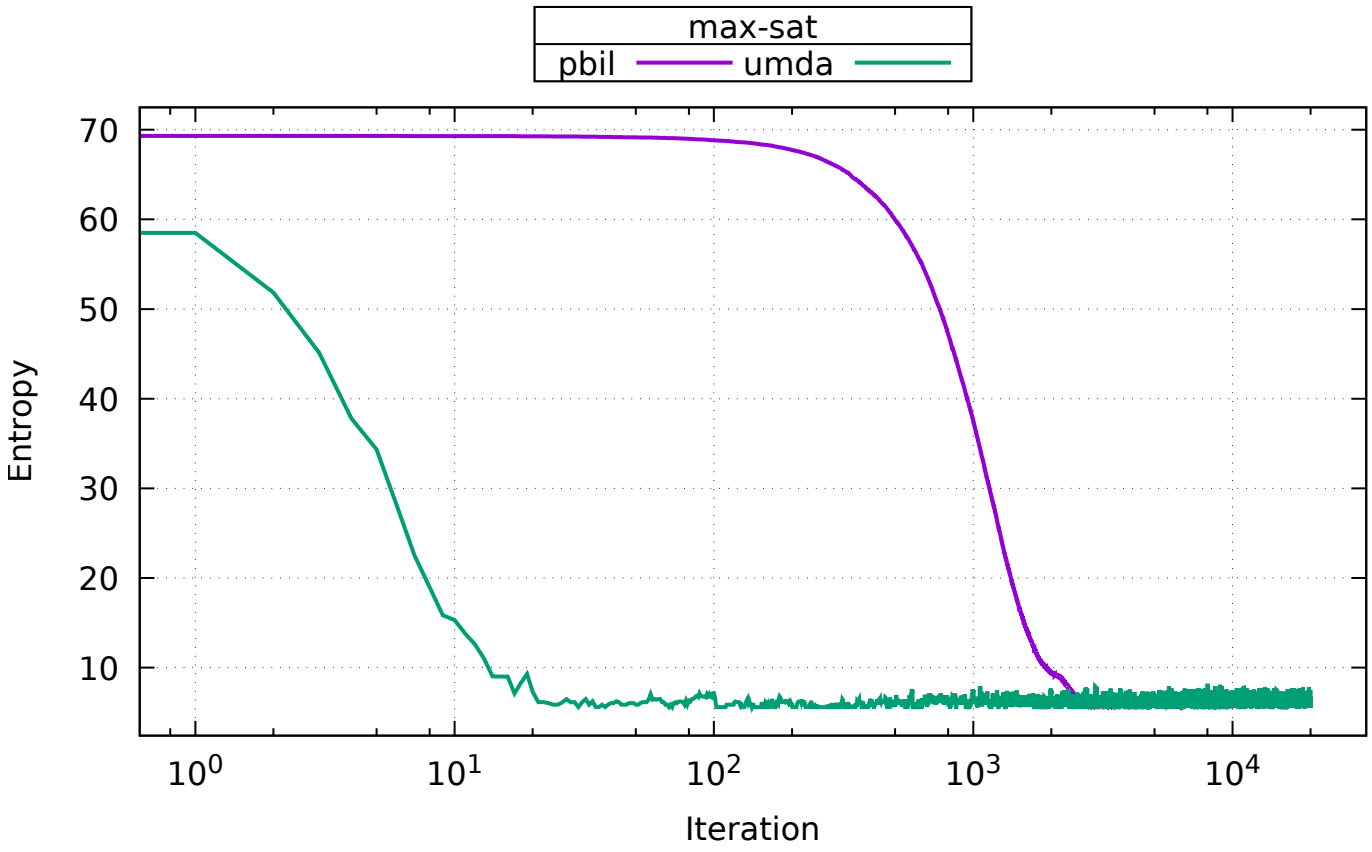
10 fp-10


fp-10
pbil
umda
Entropy
Iteration
70
60
50
40
30
20
10
10^0
10^1
10^2
10^3
10^4

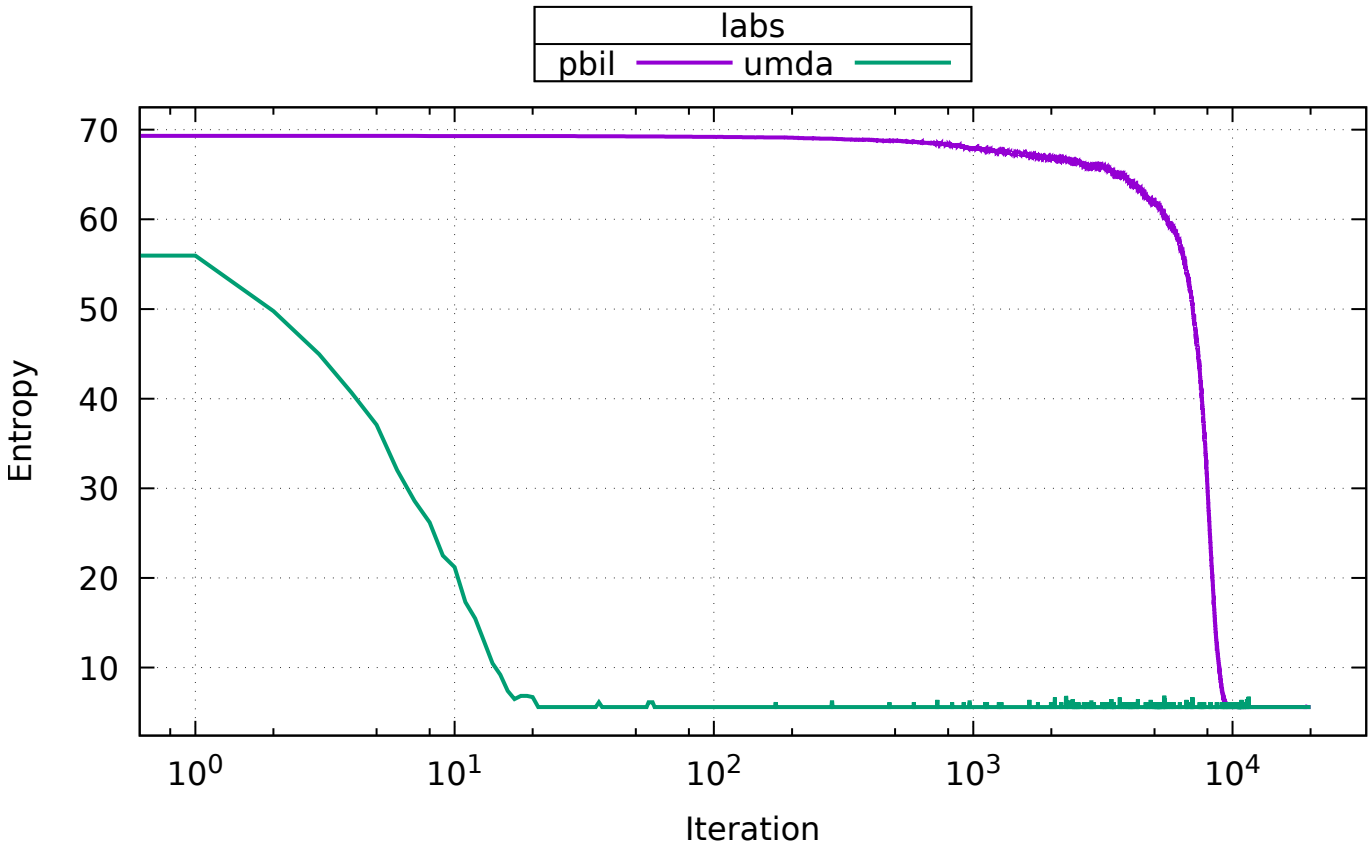
11 nk



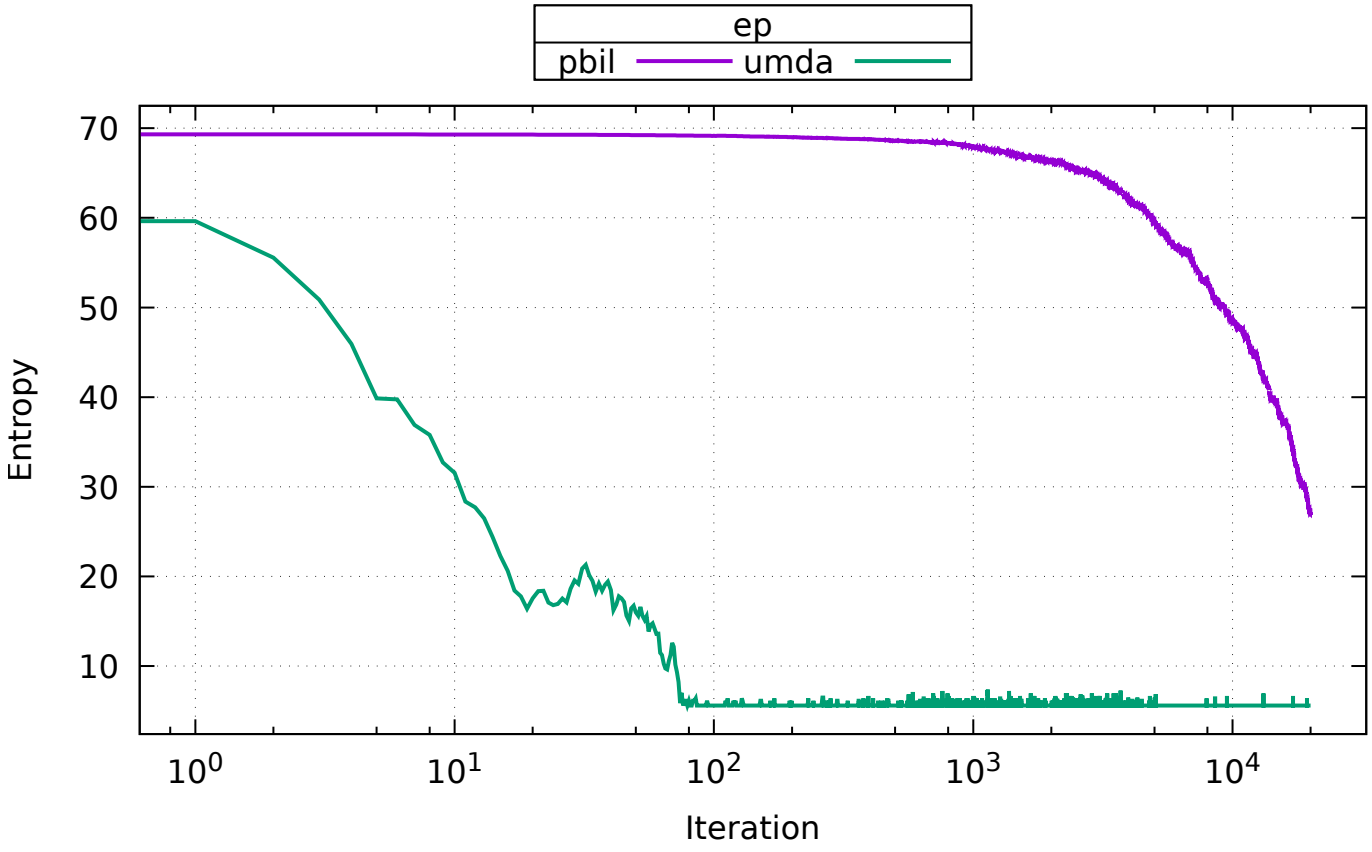
12 max-sat



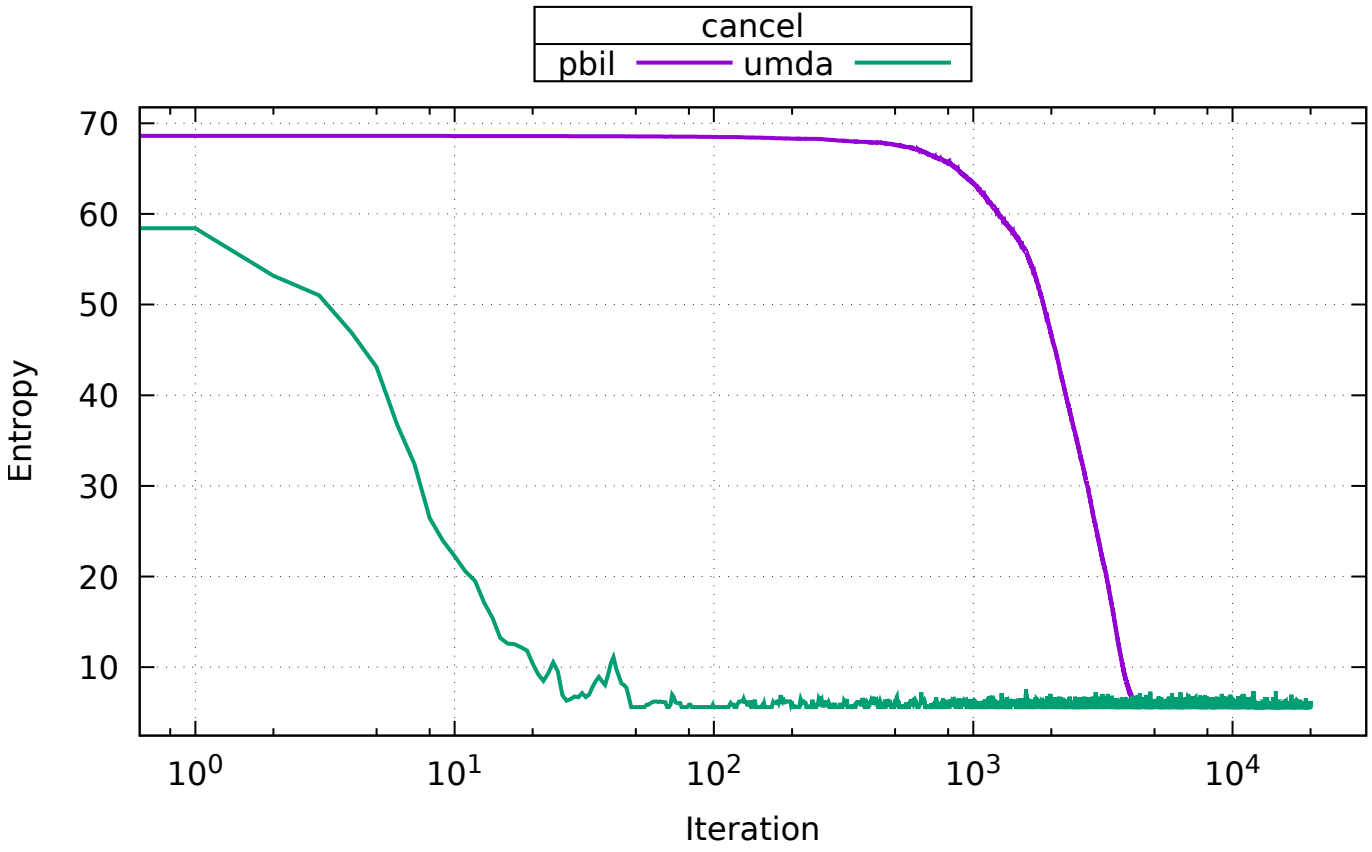
13 labs


labs
pbil
umda
Entropy
Iteration
70
60
50
40
30
20
10
10^0
10^1
10^2
10^3
10^4

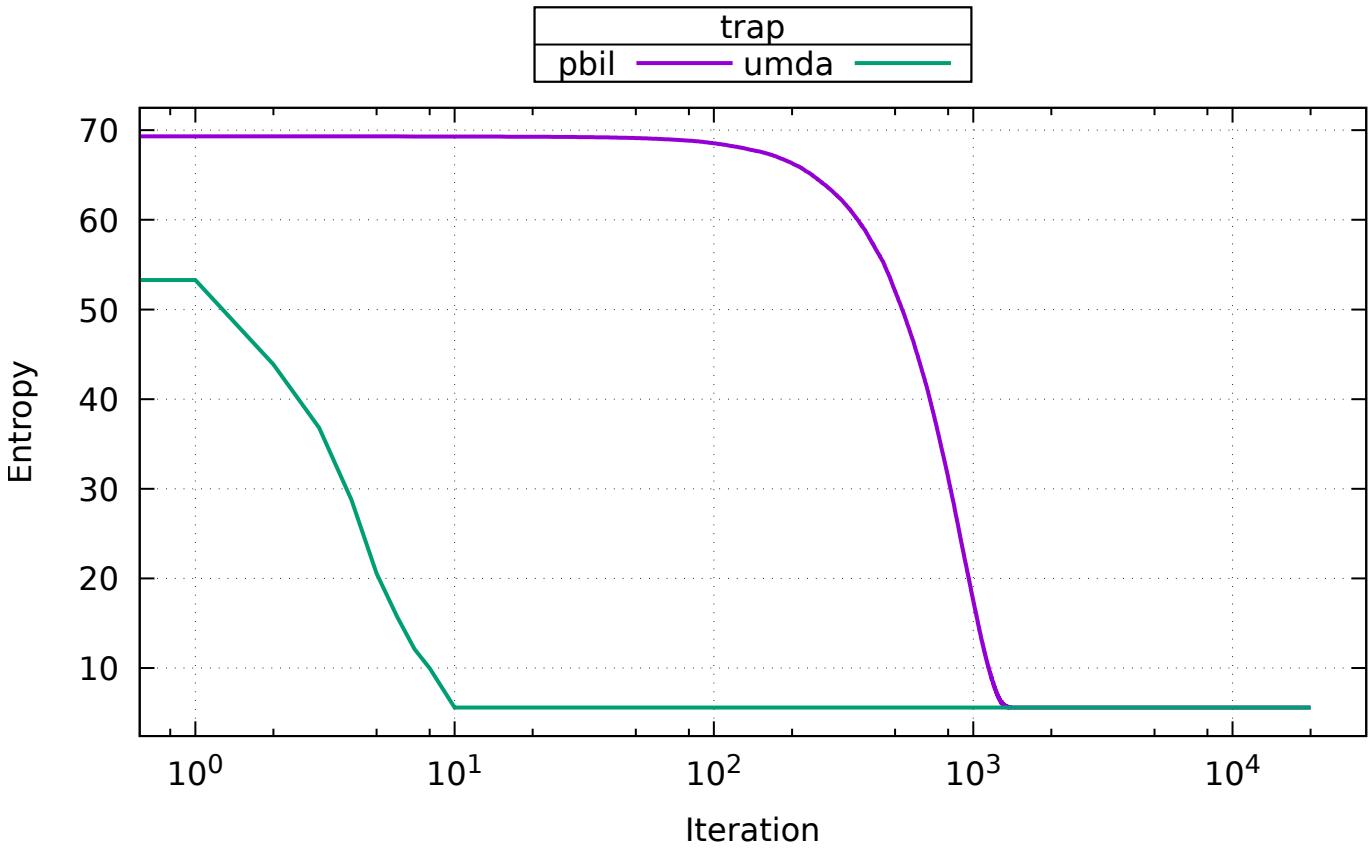
14 ep


ep
pbil
umda
Entropy
Iteration
70
60
50
40
30
20
10
10^0
10^1
10^2
10^3
10^4

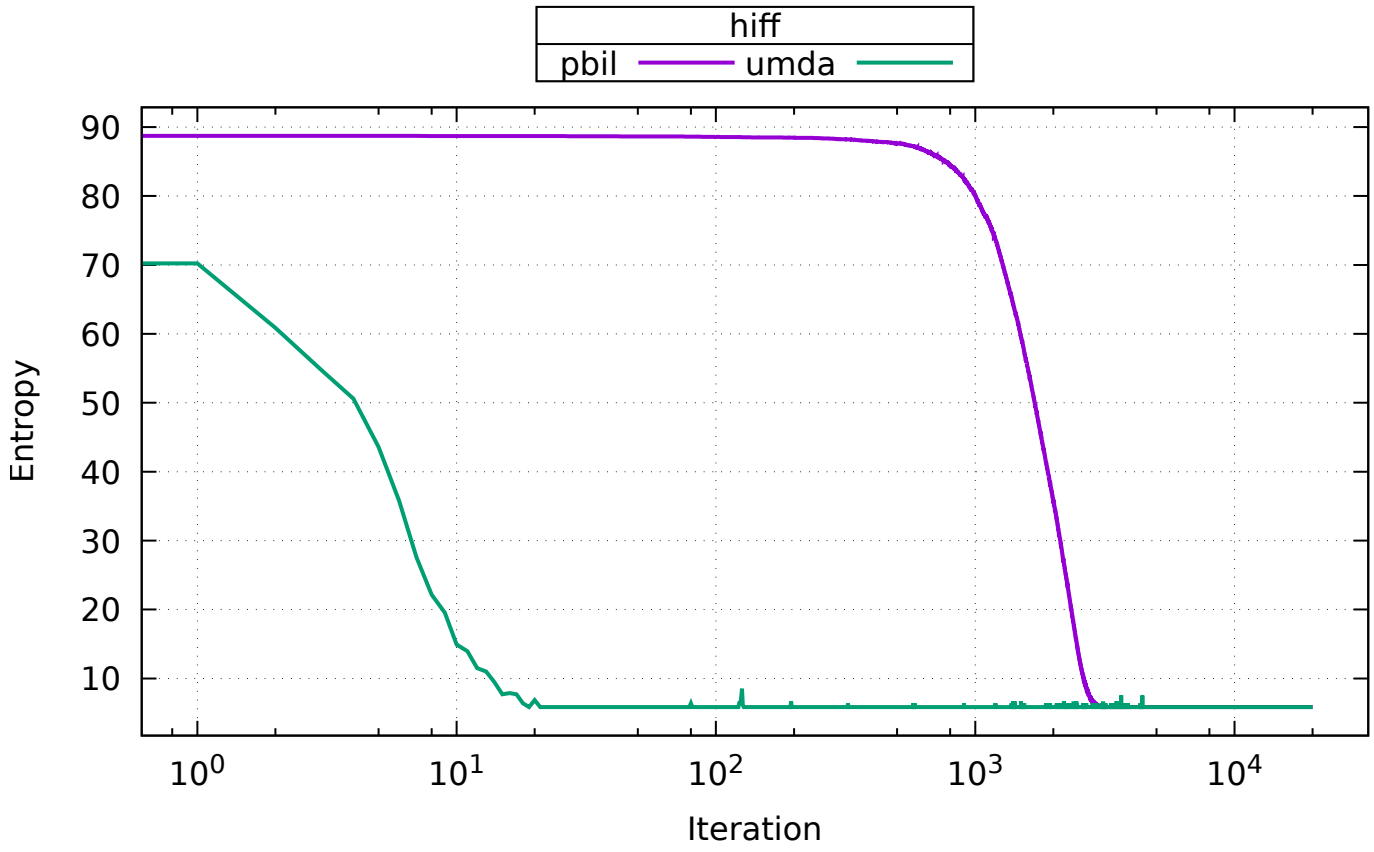
15 cancel



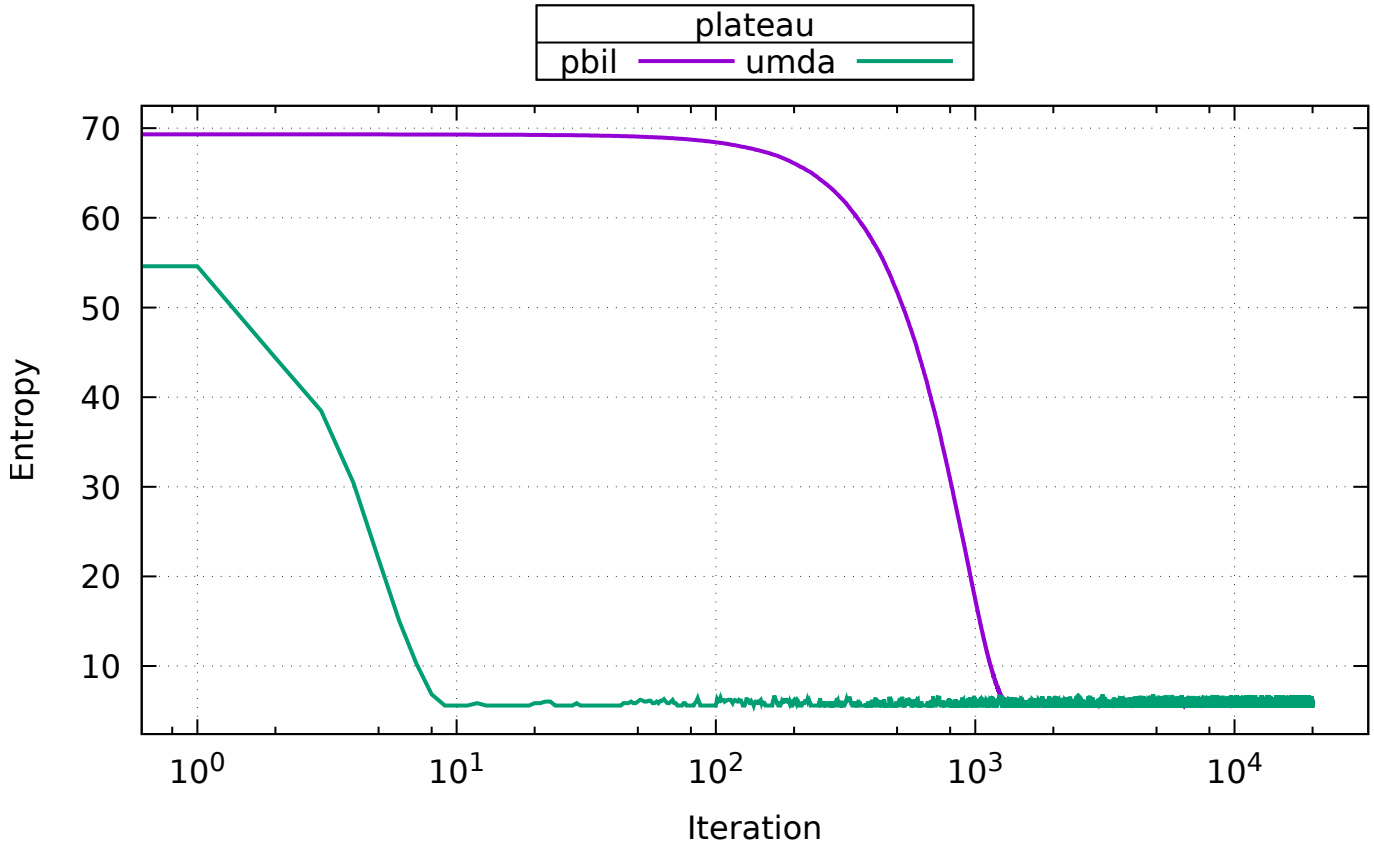
16 trap



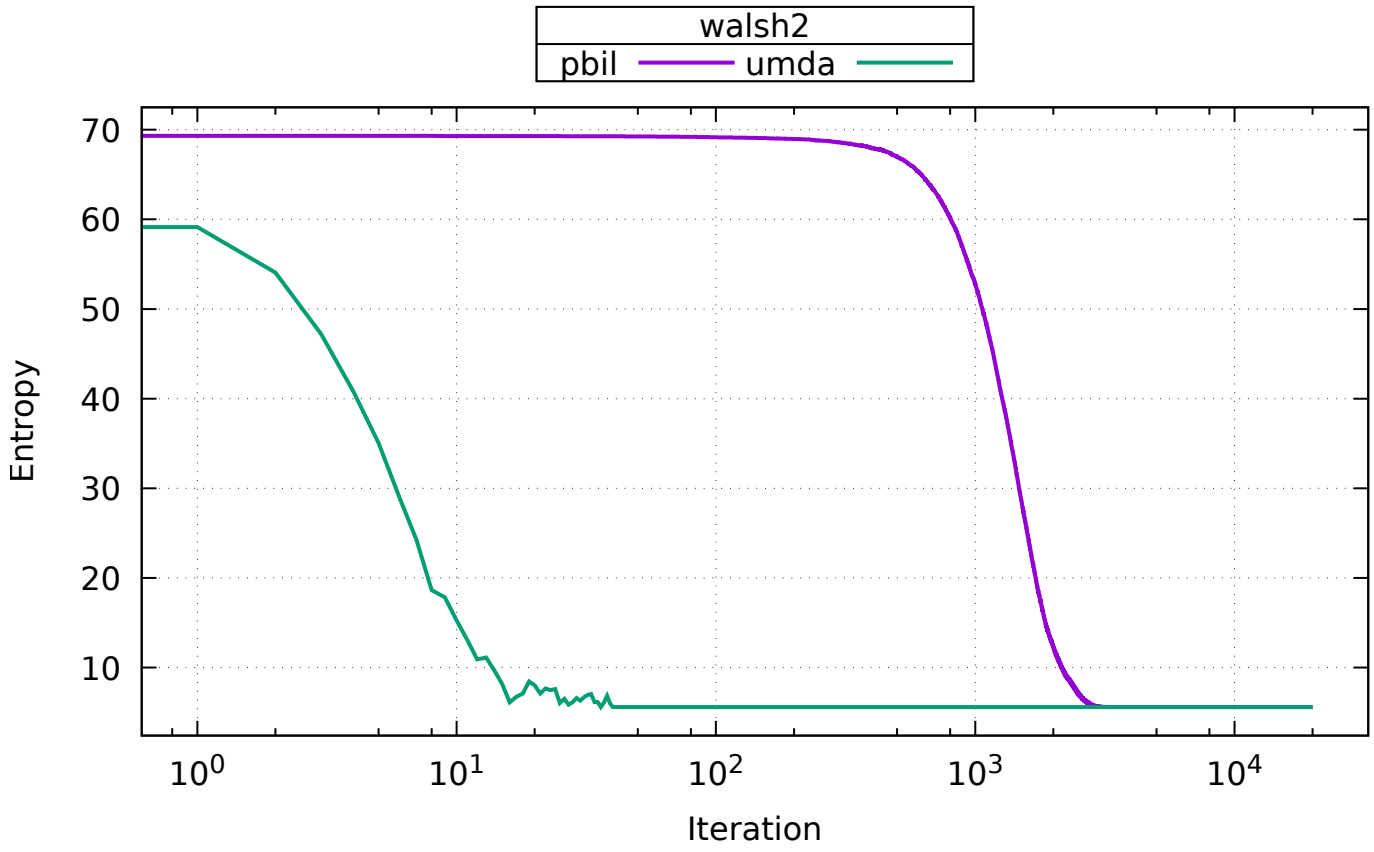
17 hiff



18 plateau



19 walsh2



A Plan

```
{
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    "opt": "--map 1 --map-random -s 100 -i 20000 -b 0 --pv-log-entropy",
    "parallel": true,
    "results": "results",
    "graphics": "graphics",
    "report": "report",
    "ylabel": "Entropy",
    "ylogscale": false,
    "functions": [
        {
            "id": "one-max",
            "opt": "-F 0"
        },
        {
            "id": "lin",
            "opt": "-F 1 -p instances/lin.100"
        },
        {
            "id": "leading-ones",
            "opt": "-F 10"
        },
        {
            "id": "ridge",
            "opt": "-F 11"
        },
        {
            "id": "jmp-5",
            "opt": "-F 30 -t 5"
        },
        {
```

```
        "id": "jmp-10",
        "opt": "-F 30 -t 10"
    },
    {
        "id": "djmp-5",
        "opt": "-F 31 -t 5"
    },
    {
        "id": "djmp-10",
        "opt": "-F 31 -t 10"
    },
    {
        "id": "fp-5",
        "opt": "-F 40 -t 5"
    },
    {
        "id": "fp-10",
        "opt": "-F 40 -t 10"
    },
    {
        "id": "nk",
        "opt": "-F 60 -p instances/nk.100.4"
    },
    {
        "id": "max-sat",
        "opt": "-F 70 -p instances/ms.100.3.1000"
    },
    {
        "id": "labs",
        "opt": "-F 80"
    },
    {
        "id": "ep",
        "opt": "-F 90 -p instances/ep.100"
    },
    {
        "id": "cancel",
        "opt": "-F 100 -s 99"
    },
    {
        "id": "trap",
        "opt": "-F 110 --fn-num-traps 10"
    },
    {
        "id": "hiff",
        "opt": "-F 120 -s 128"
    },
    {
        "id": "plateau",
        "opt": "-F 130"
    },
    {
        "id": "walsh2",
        "opt": "-F 162 -p instances/walsh2.100"
    }
],
"algorithms": [
    {
        "id": "pbil",
        "opt": "-A 500 -x 100 -y 1 -r 5e-3"
    },
    {
        "id": "umda",
```

```
            "opt": "-A 600 -x 100 -y 10"
        }
    ]
}
```

B Default parameters

```
# algorithm = 100
# bm_mc_reset_strategy = 1
# bm_num_gs_cycles = 1
# bm_num_gs_steps = 100
# bm_sampling = 1
# budget = 10000
# bv_size = 100
# cache_budget = 0
# ea_lambda = 100
# ea_mu = 10
# fn_name = noname
# fn_num_traps = 10
# fn_prefix_length = 2
# fn_threshold = 10
# function = 0
# ga_crossover_bias = 0.5
# ga_crossover_probability = 0.5
# ga_tournament_size = 10
# hea_binary_dynamics = 0
# hea_delay = 10000
# hea_num_par_updates = 1
# hea_num_seq_updates = 100
# hea_rate_strategy = 0
# hea_reset_period = 0
# hea_sampling_method = 0
# hea_time_constant = 1000
# hea_weight = 1
# learning_rate = 0.001
# map = 0
# map_input_size = 100
# map_path = nopath
# mutation_probability = 1
# neighborhood = 0
# neighborhood_iterator = 0
# noise_stddev = 1
# num_iterations = 0
# num_threads = 1
# path = nopath
# pn_mutation_probability = 1
# pn_neighborhood = 0
# pn_radius = 2
# population_size = 10
# pv_log_num_components = 5
# radius = 2
# rls_patience = 50
# sa_beta_ratio = 1.2
# sa_initial_acceptance_probability = 0.6
# sa_num_transitions = 50
# sa_num_trials = 100
# seed = 0
# selection_size = 1
# target = 100
# print_defaults
# last_parameter
# exec_name = hnco
```

```
# version = 0.8
# Generated from hnco.json
```