

## Comparative Analysis: SPACENET Dataset (Wavelet) - 2024-11-01

### Dataset Variations

- Variations compared:** approx1e5, approx1e5, approx1e5, approx1e5
- Image Type:** Green
- Representation:** Wavelet

### Comparative Results

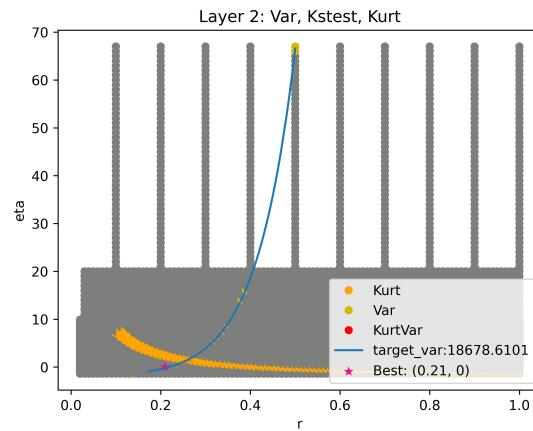
Best parameters comparison:

layer	total_samples	Gray_best_r	Red_best_r	Blue_best_r	Green_best_r	Gray_best_eta	Red_best_eta	Blue_best_eta	Green_best_eta	Gray_kst
2	27208	0.205	0.207	0.208	0.204	-0.1	-0.08	-0.08	-0.1	
3	108832	0.086	0.087	0.087	0.087	-1.37	-1.37	-1.37	-1.37	
4	333298	0.171	0.13	0.126	0.12	-0.92	-1.24	-1.23	-1.24	
5	1.14954e+06	0.162	0.19	0.192	0.161	-1.14	-1.05	-1.04	-1.14	
6	4.25125e+06	0.228	0.24	0.24	0.224	-0.97	-0.93	-0.95	-0.97	
7	1.7005e+07	0.27	0.28	0.28	0.271	-1.03	-1.01	-1.03	-1.02	
8	6.802e+07	0.42	0.438	0.455	0.42	-1.01	-1	-1.01	-1	
9	2.7208e+08	1.229	1.29	9.9999	1.29	-1	-1.03	-1.08	-1.03	

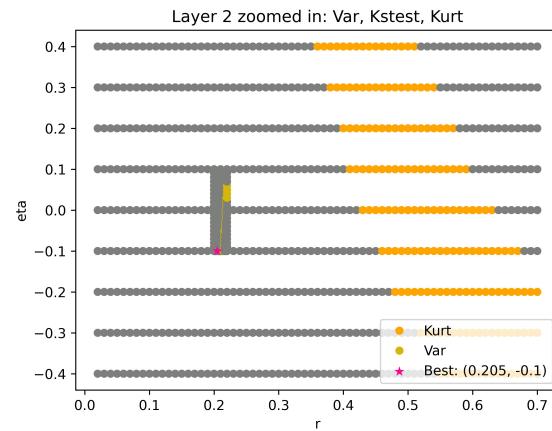
Full Grid Search Combo Plots Comparison

Layer 2

gray

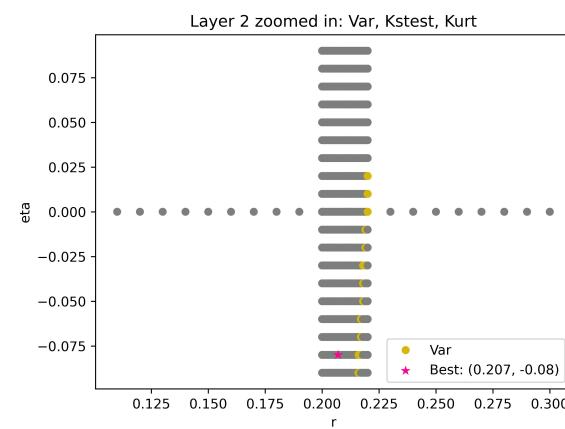
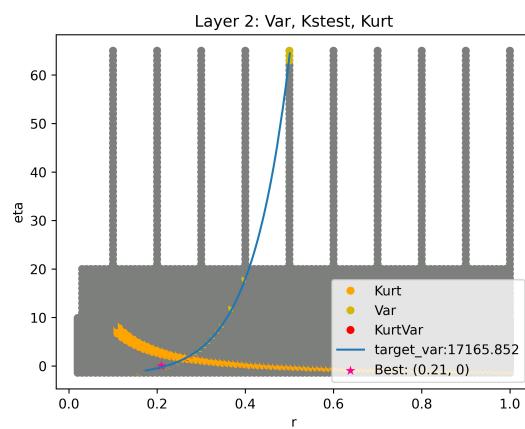


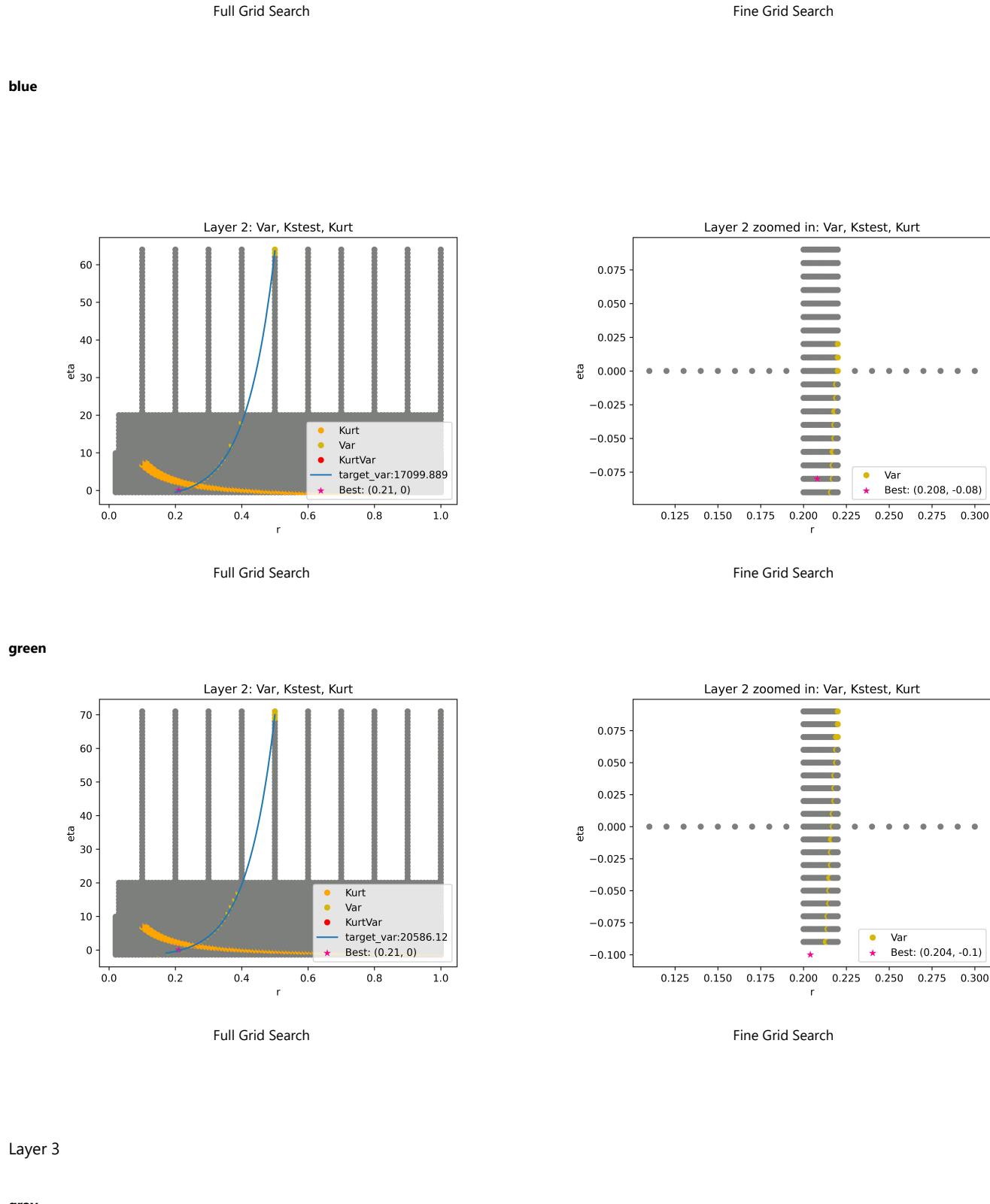
Full Grid Search

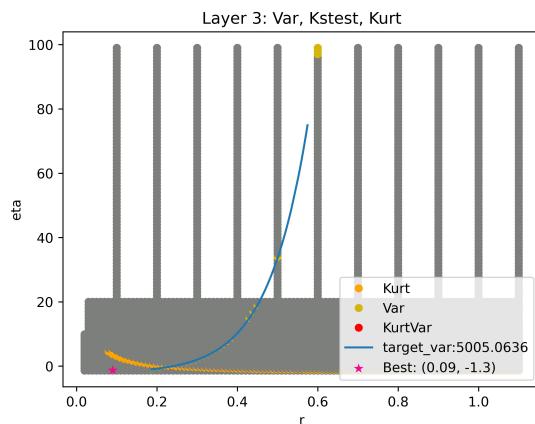


Fine Grid Search

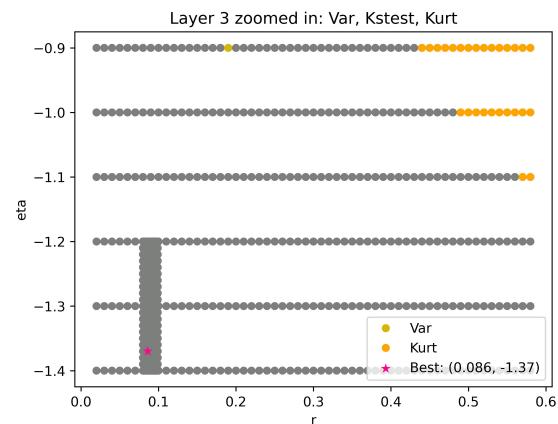
red



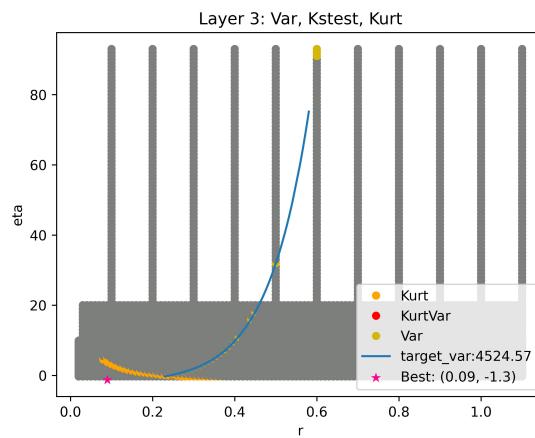




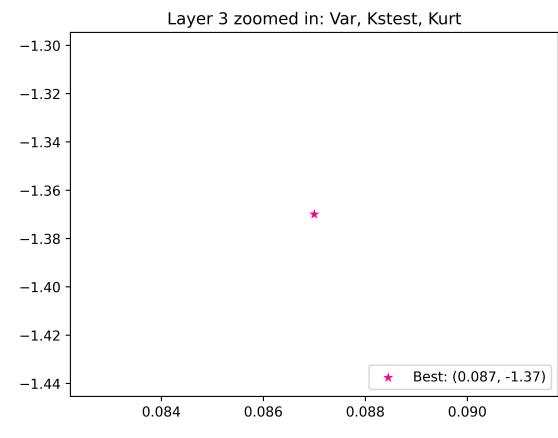
Full Grid Search



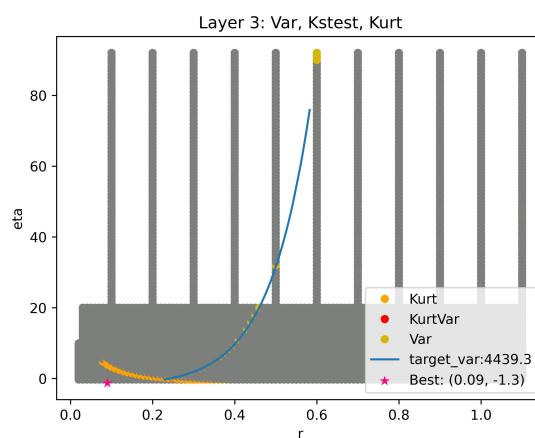
Fine Grid Search

**red**

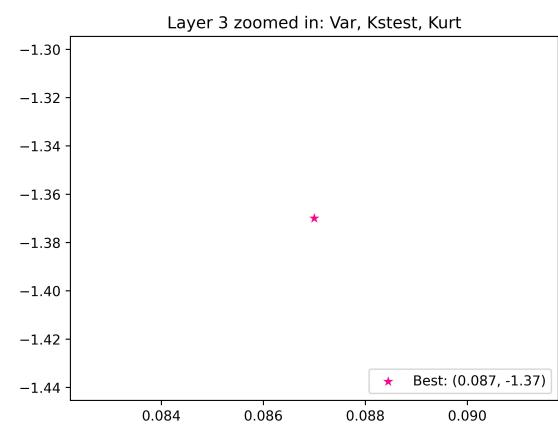
Full Grid Search



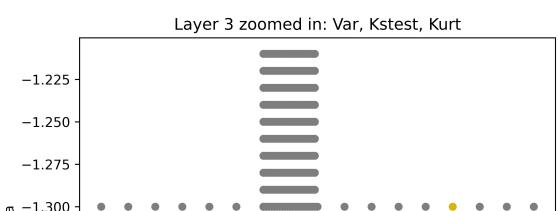
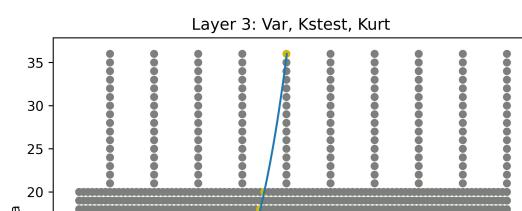
Fine Grid Search

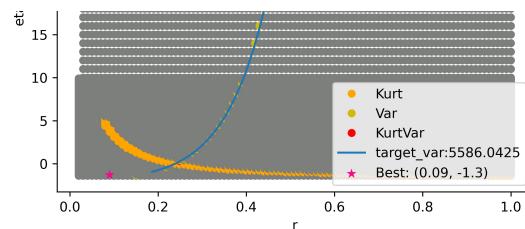
**blue**

Full Grid Search

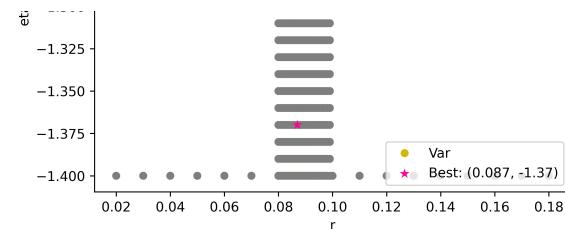


Fine Grid Search

**green**



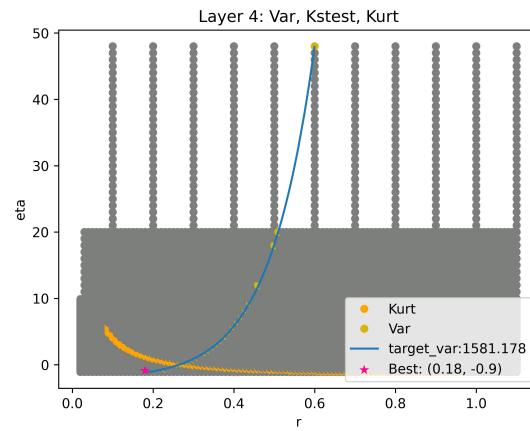
Full Grid Search



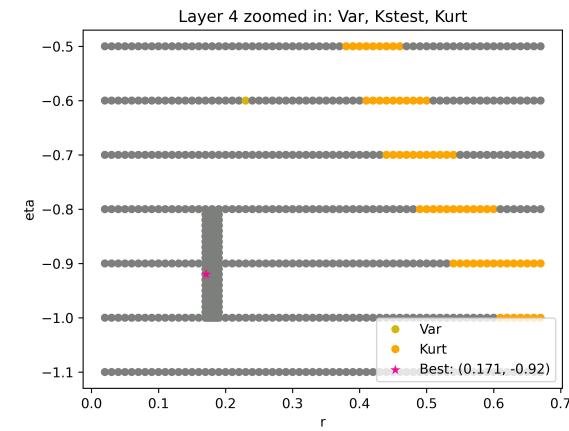
Fine Grid Search

## Layer 4

gray

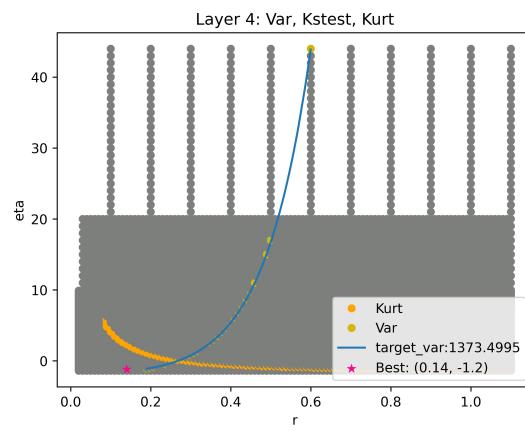


Full Grid Search

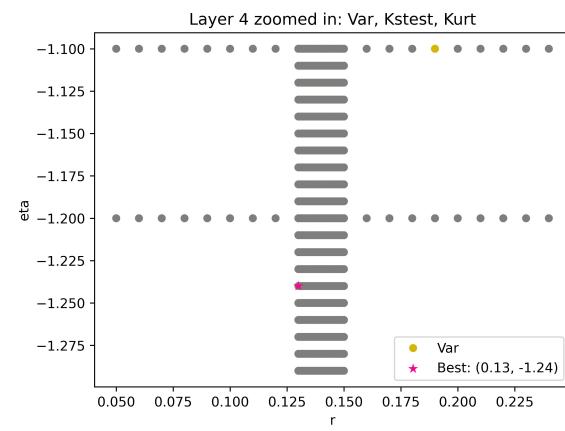


Fine Grid Search

red

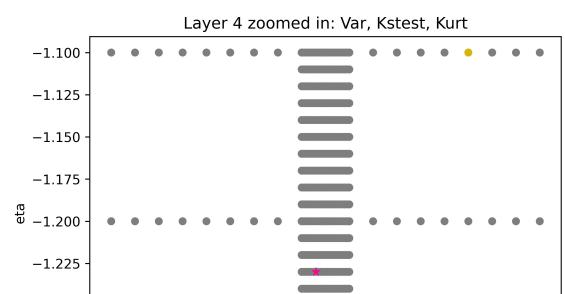
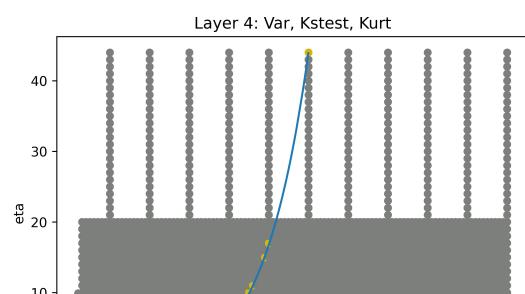


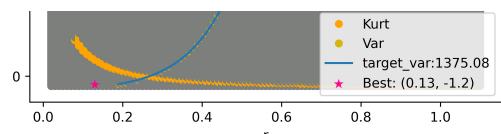
Full Grid Search



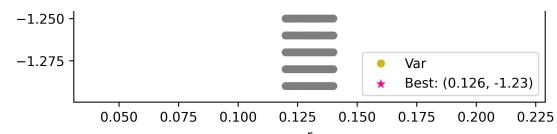
Fine Grid Search

blue

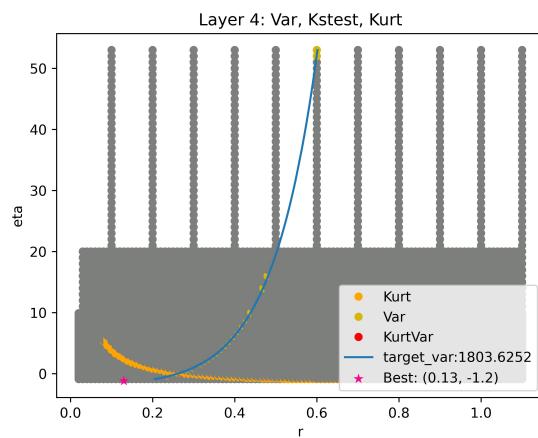




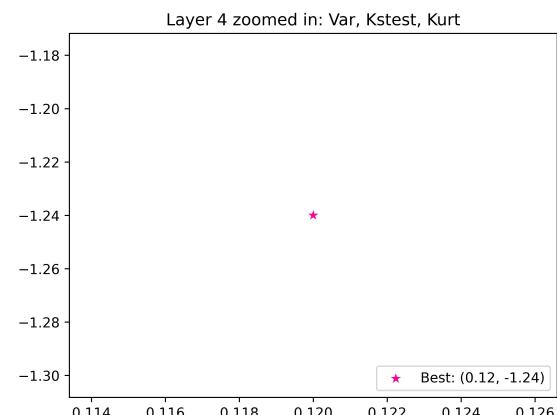
Full Grid Search



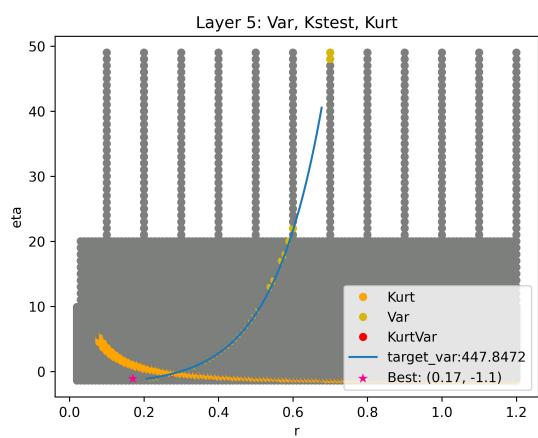
Fine Grid Search

**green**

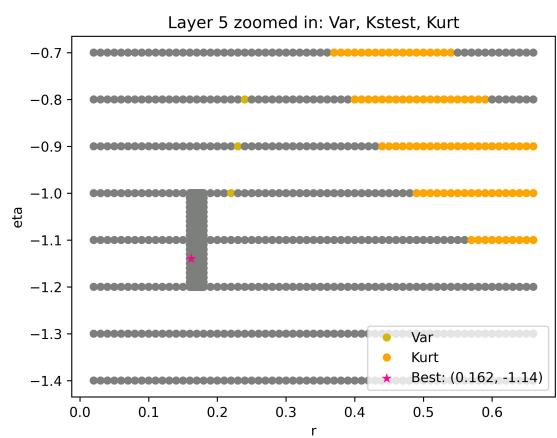
Full Grid Search



Fine Grid Search

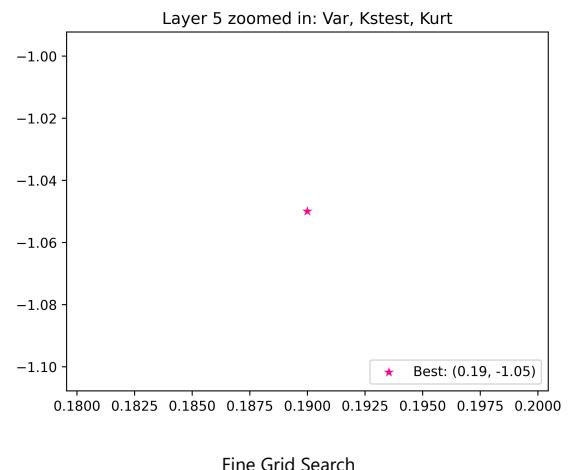
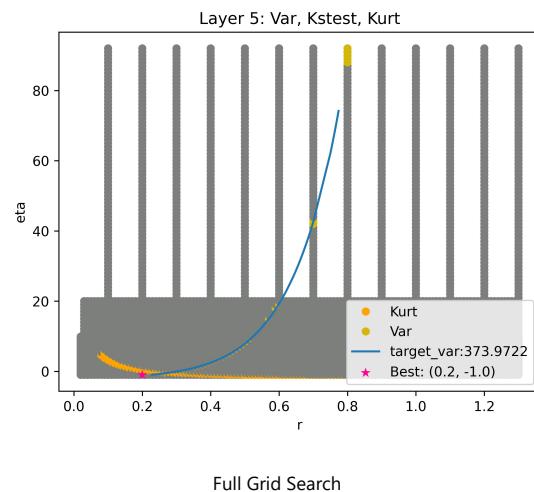
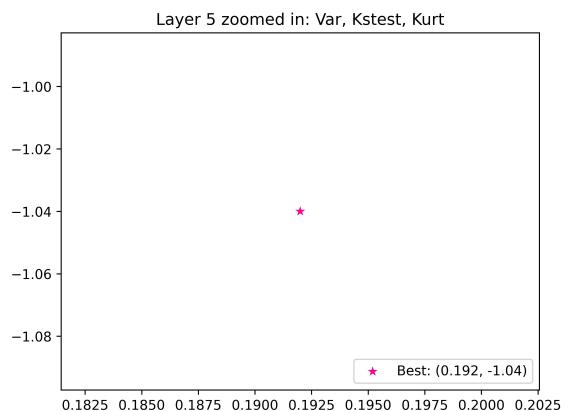
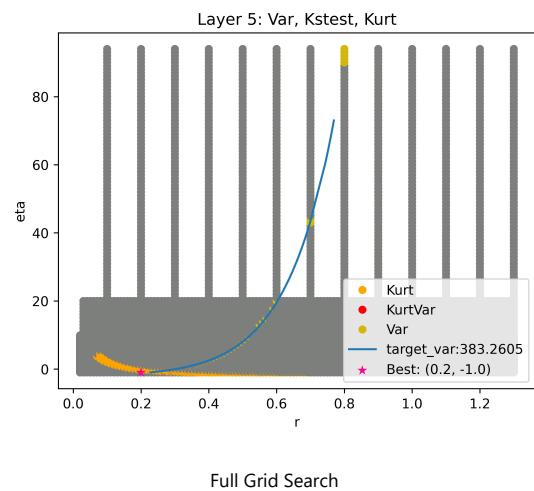
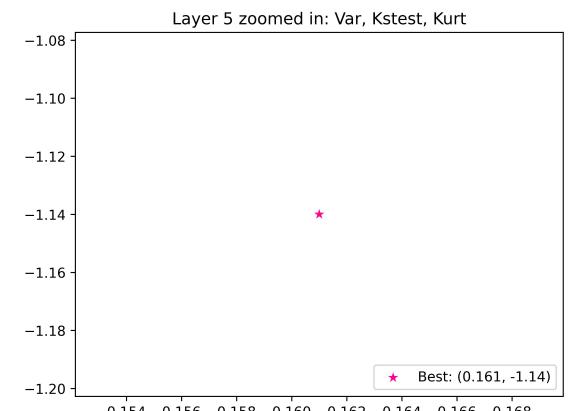
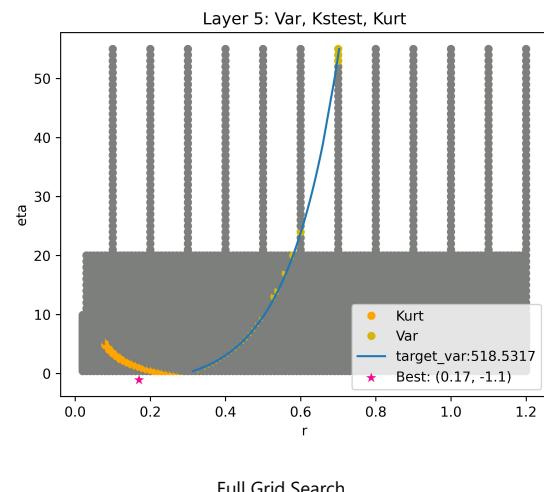
**Layer 5****gray**

Full Grid Search

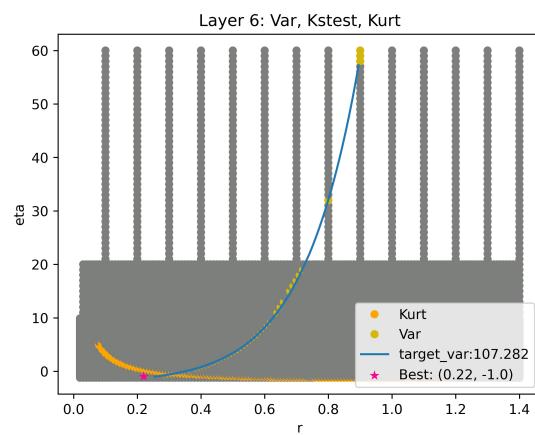


Fine Grid Search

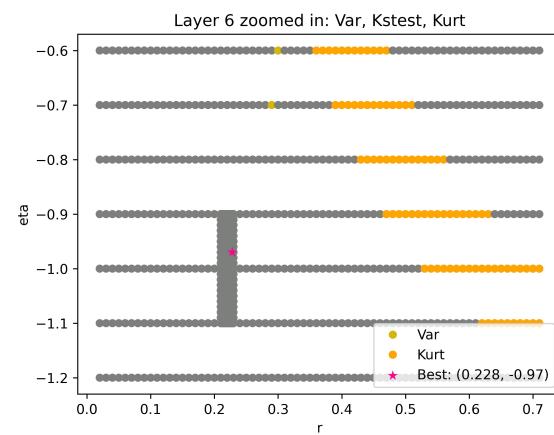
**red**

**blue****green**

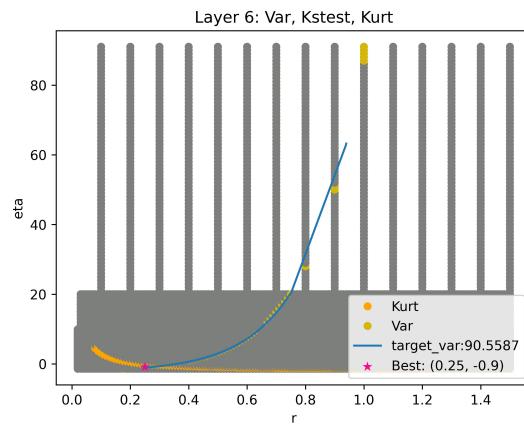
Layer 6

**gray**

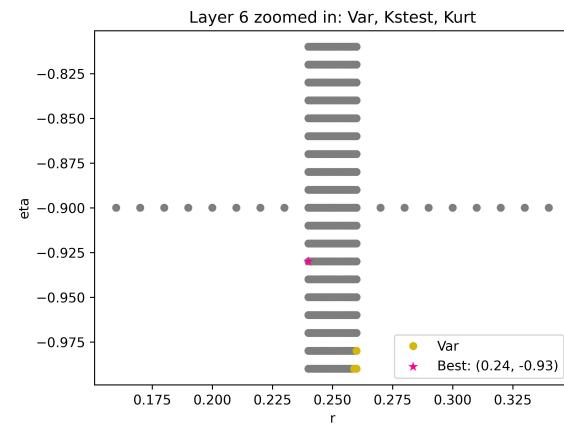
Full Grid Search



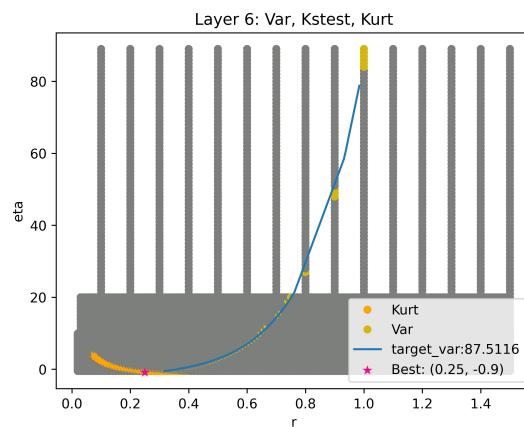
Fine Grid Search

**red**

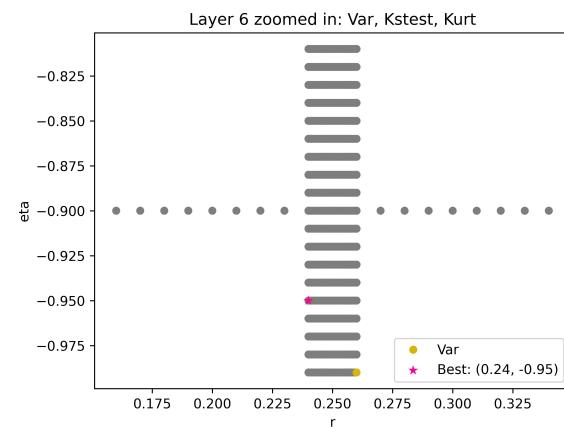
Full Grid Search



Fine Grid Search

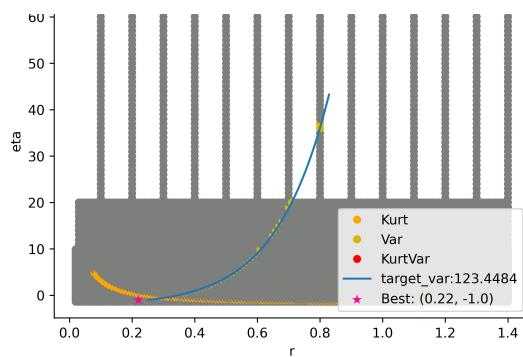
**blue**

Full Grid Search

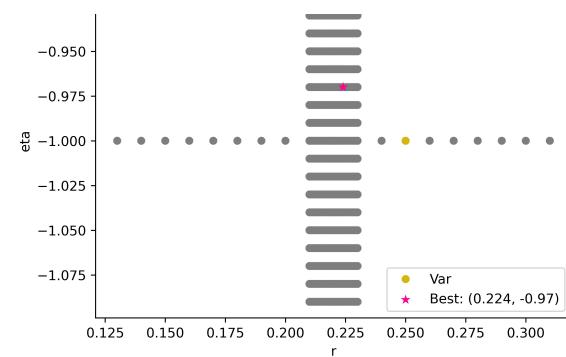


Fine Grid Search

**green**



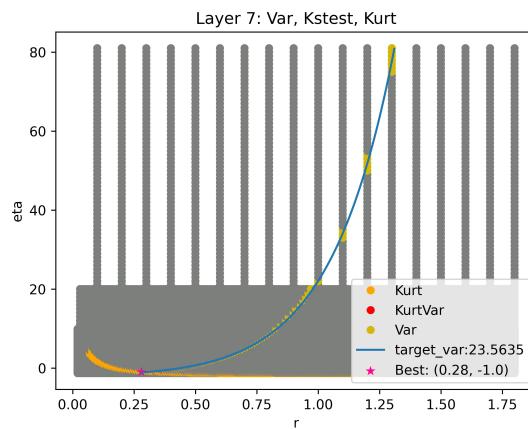
Full Grid Search



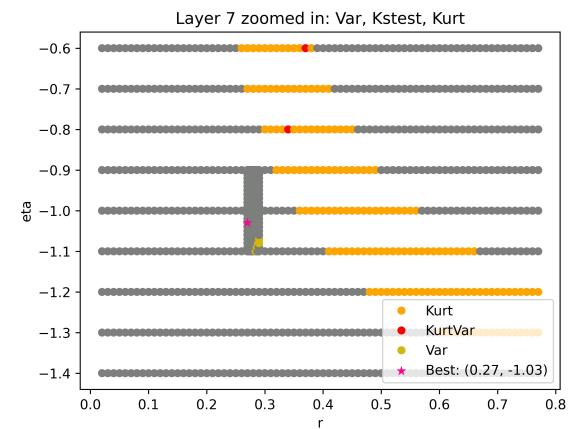
Fine Grid Search

## Layer 7

gray

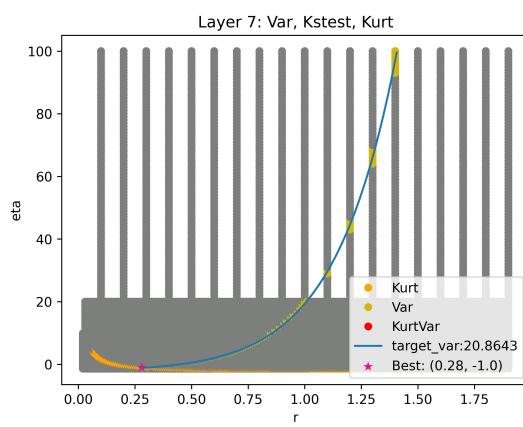


Full Grid Search

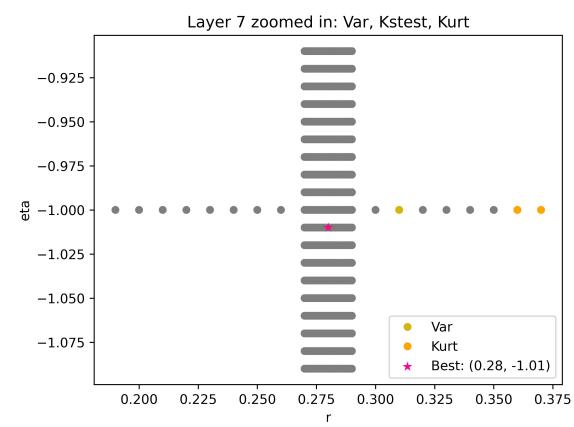


Fine Grid Search

red

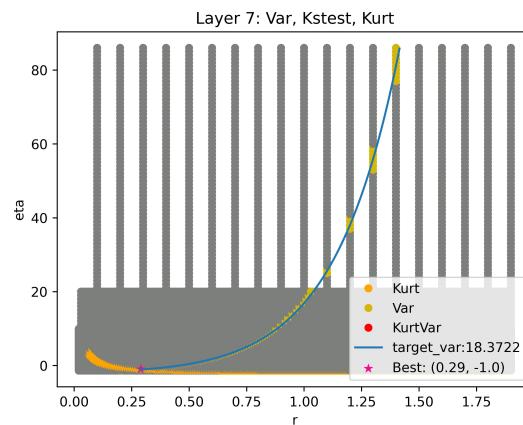


Full Grid Search

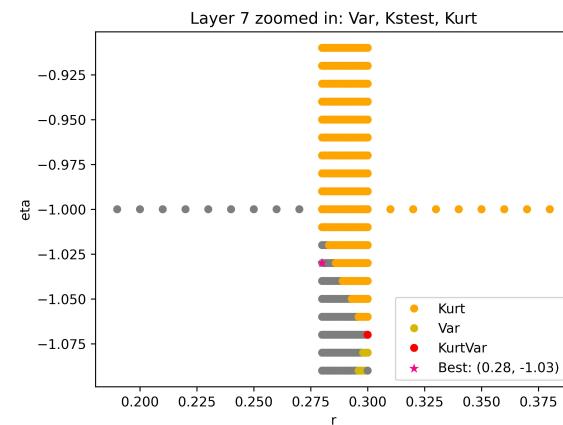


Fine Grid Search

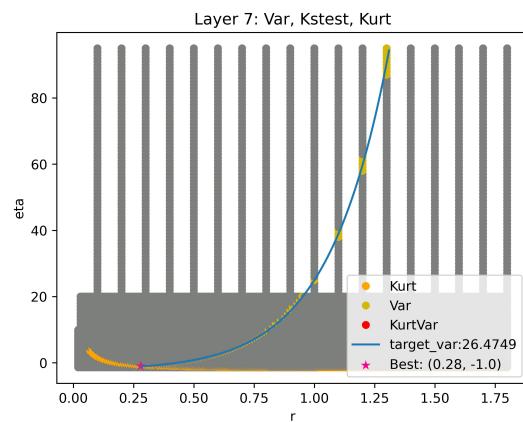
blue



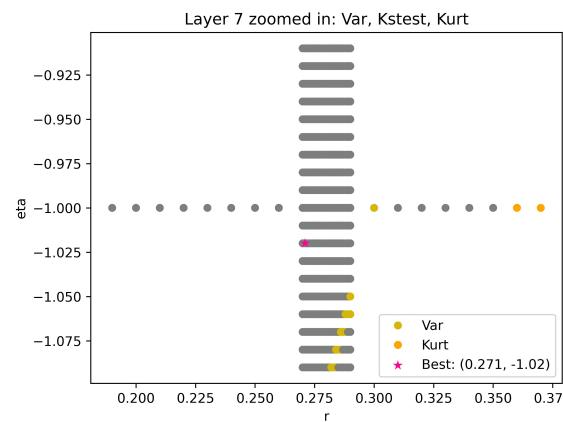
Full Grid Search



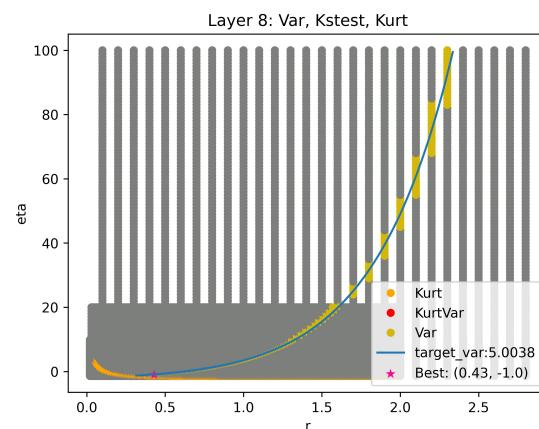
Fine Grid Search

**green**

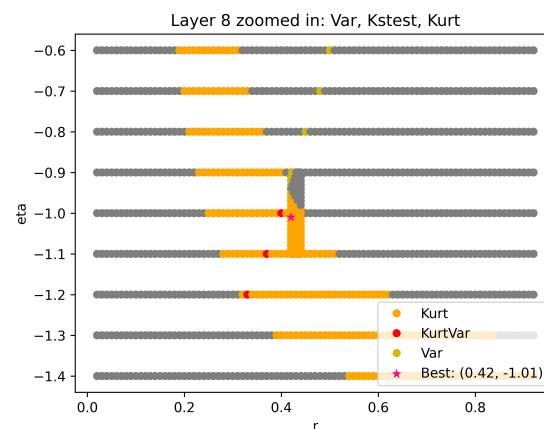
Full Grid Search



Fine Grid Search

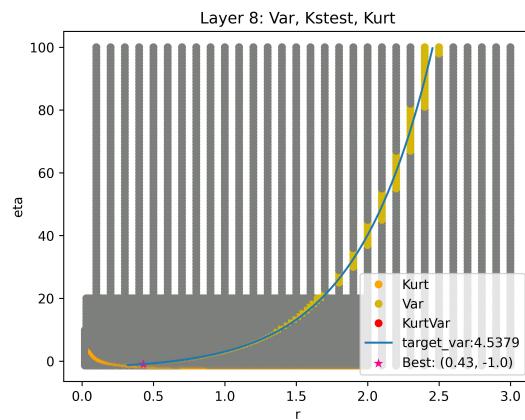
**Layer 8****gray**

Full Grid Search

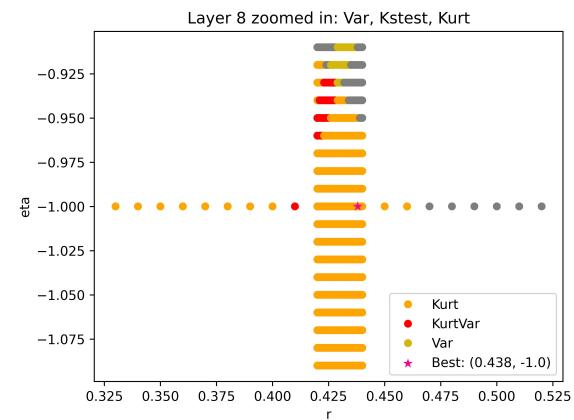


Fine Grid Search

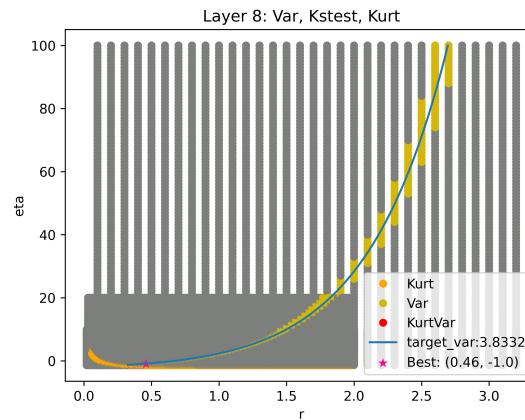
**red**



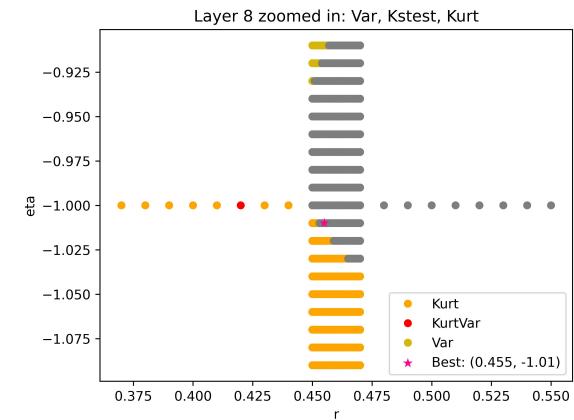
Full Grid Search



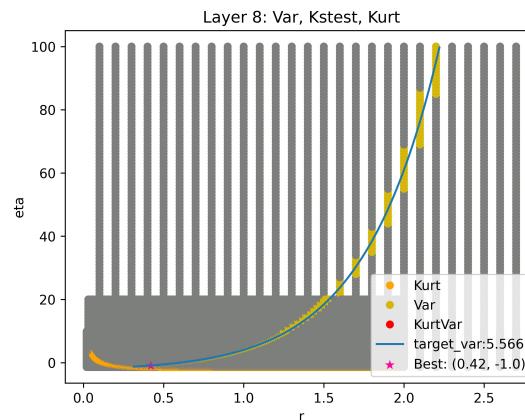
Fine Grid Search

**blue**

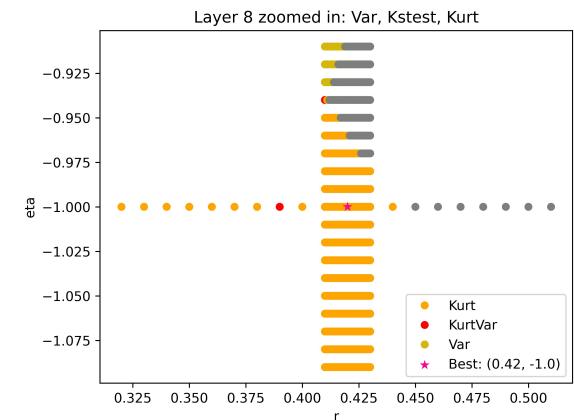
Full Grid Search



Fine Grid Search

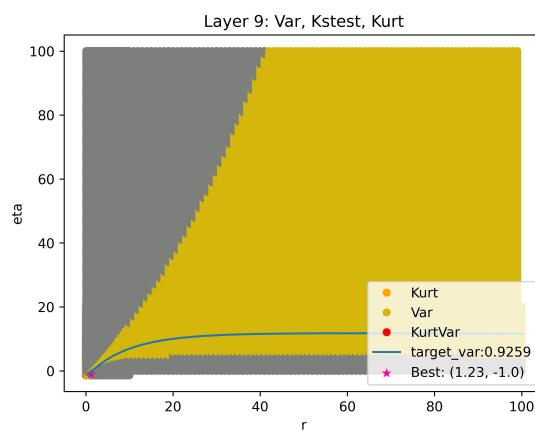
**green**

Full Grid Search

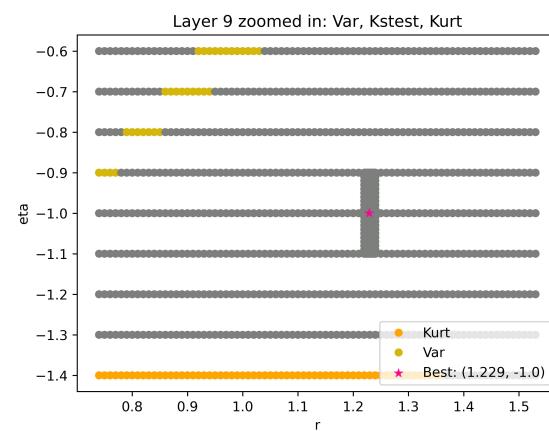


Fine Grid Search

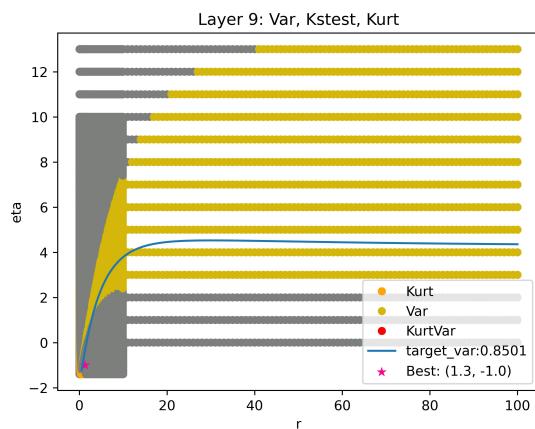
**Layer 9**

**gray**

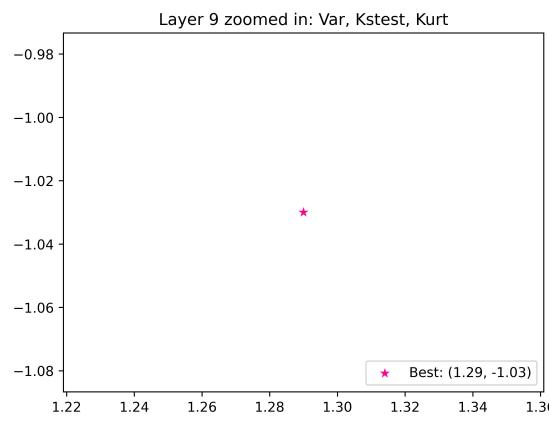
Full Grid Search



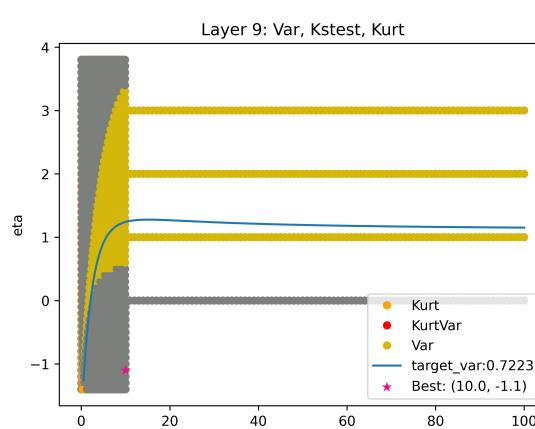
Fine Grid Search

**red**

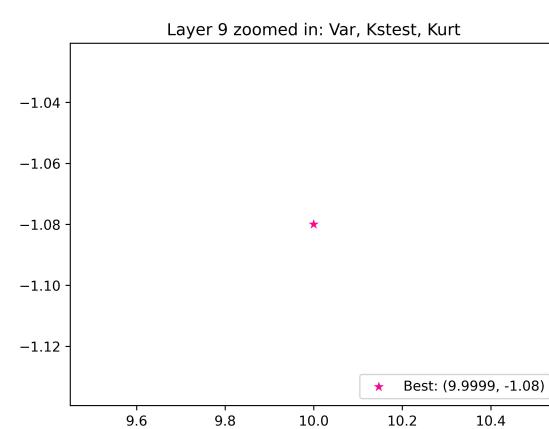
Full Grid Search



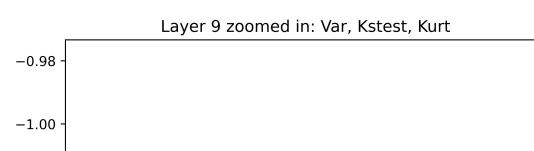
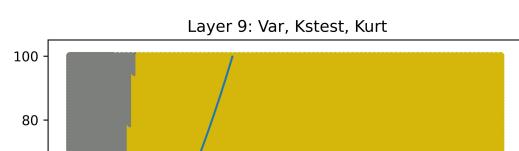
Fine Grid Search

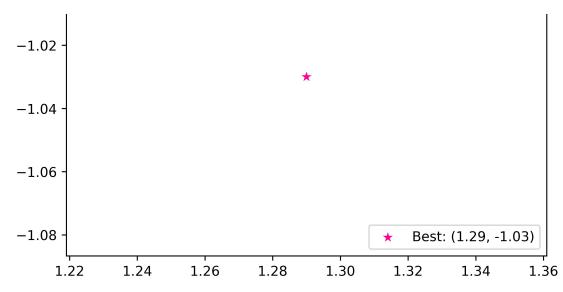
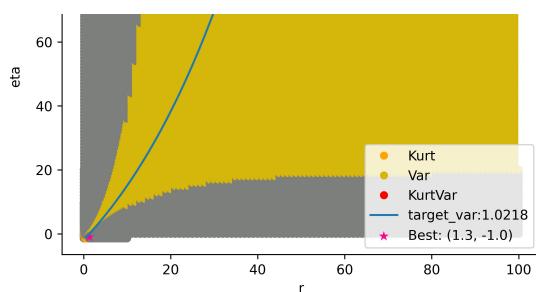
**blue**

Full Grid Search



Fine Grid Search

**green**



### Compare CDF PDF Plots



### Individual Analyses

gray

**Optimization progression:**

layer	initial_r	initial_eta	kstest_stat_initial	best_r	best_eta	iter1_r	iter1_eta	kstest_stat_iter1
2	0.21	0	0.0209023	0.205	-0.1	0.205	-0.1	0.0195055
3	0.09	-1.3	0.13244	0.086	-1.37	0.086	-1.37	0.13244
4	0.18	-0.9	0.07707	0.171	-0.92	0.171	-0.92	0.07707
5	0.17	-1.1	0.0421566	0.162	-1.14	0.162	-1.14	0.042154
6	0.22	-1	0.0236605	0.228	-0.97	0.228	-0.97	0.0213042
7	0.28	-1	0.0185749	0.27	-1.03	0.27	-1.03	0.0137644
8	0.43	-1	0.0124702	0.42	-1.01	0.42	-1.01	0.0116561
9	1.23	-1	0.0166035	1.229	-1	1.229	-1	0.0165857

red

**Optimization progression:**

layer	initial_r	initial_eta	kstest_stat_initial	best_r	best_eta	iter1_r	iter1_eta	kstest_stat_iter1
2	0.21	0	0.0209908	0.207	-0.08	0.207	-0.08	0.0184292
3	0.09	-1.3	0.13153	0.087	-1.37	0.087	-1.37	0.13153
4	0.14	-1.2	0.0763669	0.13	-1.24	0.13	-1.24	0.07636
5	0.2	-1	0.0402471	0.19	-1.05	0.19	-1.05	0.0402451
6	0.25	-0.9	0.0209932	0.24	-0.93	0.24	-0.93	0.0185339
7	0.28	-1	0.016885	0.28	-1.01	0.28	-1.01	0.0133396
8	0.43	-1	0.0132542	0.438	-1	0.438	-1	0.0132541
9	1.3	-1	0.0244945	1.29	-1.03	1.29	-1.03	0.024493

blue

**Optimization progression:**

layer	initial_r	initial_eta	kstest_stat_initial	best_r	best_eta	iter1_r	iter1_eta	kstest_stat_iter1
2	0.21	0	0.0248394	0.208	-0.08	0.208	-0.08	0.0216796
3	0.09	-1.3	0.13192	0.087	-1.37	0.087	-1.37	0.13192
4	0.13	-1.2	0.07505	0.126	-1.23	0.126	-1.23	0.07505
5	0.2	-1	0.0398371	0.192	-1.04	0.192	-1.04	0.0398356
6	0.25	-0.9	0.0292834	0.24	-0.95	0.24	-0.95	0.0227437
7	0.29	-1	0.0194895	0.28	-1.03	0.28	-1.03	0.0140941
8	0.46	-1	0.0145899	0.455	-1.01	0.455	-1.01	0.0119646
9	10	-1.1	0.0283354	9.9999	-1.08	9.9999	-1.08	0.0234527

green

**Optimization progression:**

layer	initial_r	initial_eta	kstest_stat_initial	best_r	best_eta	iter1_r	iter1_eta	kstest_stat_iter1
2	0.21	0	0.0210254	0.204	-0.1	0.204	-0.1	0.0192117
3	0.09	-1.3	0.13308	0.087	-1.37	0.087	-1.37	0.13308
4	0.13	-1.2	0.0778	0.12	-1.24	0.12	-1.24	0.0778
5	0.17	-1.1	0.0431227	0.161	-1.14	0.161	-1.14	0.0431176
6	0.22	-1	0.0277339	0.224	-0.97	0.224	-0.97	0.0206473
7	0.28	-1	0.0159148	0.271	-1.02	0.271	-1.02	0.0135019
8	0.42	-1	0.0123914	0.42	-1	0.42	-1	0.0123914
9	1.3	-1	0.0253345	1.29	-1.03	1.29	-1.03	0.025333