

ZHH Analysis.

Template fit with backgrounds

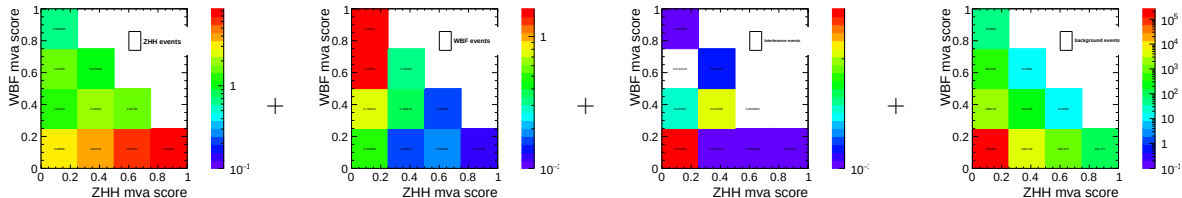
Julie Munch Torndal
Analysis meeting
September 28, 2026



HELMHOLTZ



Template fit with toy models



Template:

$$\text{hist}_{\text{template}} = f_1 \cdot \text{hist}_{\text{ZHH}} + f_2 \cdot \text{hist}_{\text{WBF}} + \sqrt{f_1 \cdot f_2} \cdot \text{hist}_{\text{int}} + f_3 \cdot \text{hist}_{\text{bkg}}$$

Fit model: 2D log-likelihood with 10K toy models

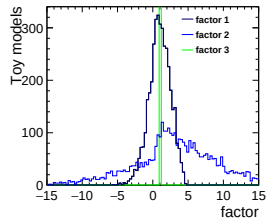
$$LLH = \sum_i \sum_j \text{Log}(\text{Poisson}(\text{data}_{i,j}, \text{temp}_{i,j}))$$

Fit results incl. interference

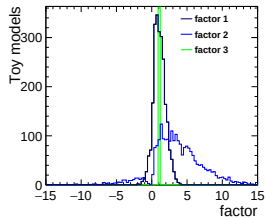
bins	factor 1	factor 2	factor 3
2x2	0.975266 ± 1.51919	2.91673 ± 5.52681	0.999979 ± 0.00193627
3x3	1.06031 ± 1.03486	3.83208 ± 4.43789	0.999798 ± 0.00186486
4x4	1.10422 ± 0.850998	3.67694 ± 3.47321	0.99986 ± 0.00193027
5x5	1.04885 ± 0.772059	3.37464 ± 2.96109	0.999982 ± 0.00190639
6x6	1.05971 ± 0.645242	3.4125 ± 2.5436	0.999939 ± 0.00190185
7x7	1.13455 ± 0.640406	3.17975 ± 2.29158	0.999986 ± 0.00196523
8x8	1.16854 ± 0.590455	3.44818 ± 2.36853	0.999937 ± 0.00197346
9x9	1.15185 ± 0.534469	3.84284 ± 2.52981	0.999924 ± 0.00194346
10x10	1.17359 ± 0.539792	3.92061 ± 2.48319	0.999966 ± 0.00191502

Fit results incl. interference

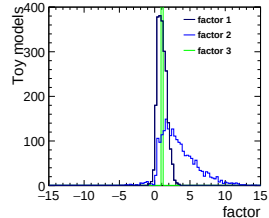
2x2:



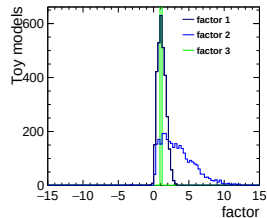
4x4:



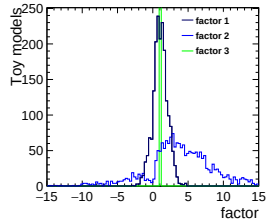
6x6:



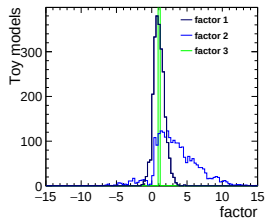
8x8:



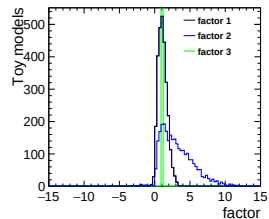
3x3:



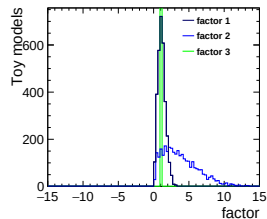
5x5:



7x7:

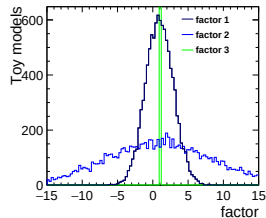


9x9:

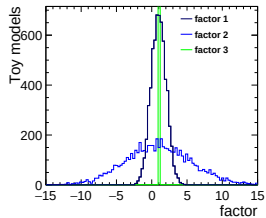


Fit results excl. interference

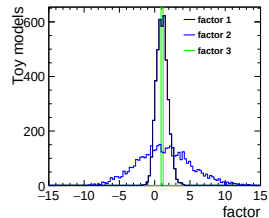
2x2:



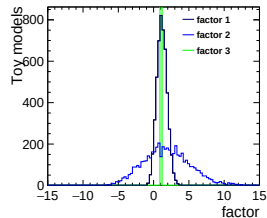
4x4:



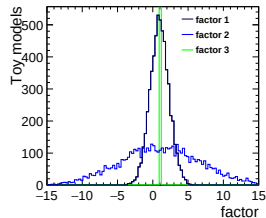
6x6:



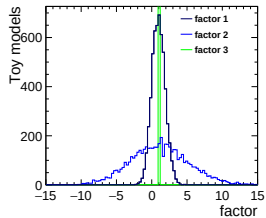
8x8:



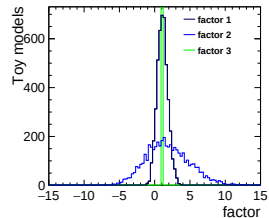
3x3:



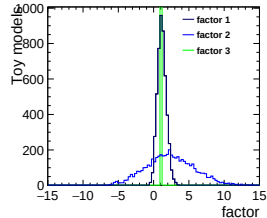
5x5:



7x7:



9x9:



Fit results excl. interference

bins	factor 1	factor 2	factor 3
2x2	0.949569 ± 1.96439	0.678453 ± 6.70169	0.999999 ± 0.00193959
3x3	0.958563 ± 1.35768	0.968843 ± 5.5694	1.00001 ± 0.00194812
4x4	0.978862 ± 1.0625	0.955781 ± 4.68592	0.999954 ± 0.00193628
5x5	0.957653 ± 0.940783	1.10014 ± 4.14927	0.999977 ± 0.00193173
6x6	1.0575 ± 0.813809	1.343 ± 3.80897	1 ± 0.00192541
7x7	1.11096 ± 0.7559	1.85619 ± 3.10934	0.999946 ± 0.00194927
8x8	1.18465 ± 0.714193	1.87158 ± 3.30096	0.999965 ± 0.00195317
9x9	1.17545 ± 0.621526	2.37249 ± 3.40216	0.999907 ± 0.00194612
10x10	1.19329 ± 0.612266	2.49036 ± 3.37268	0.999988 ± 0.00193191

backgrounds

