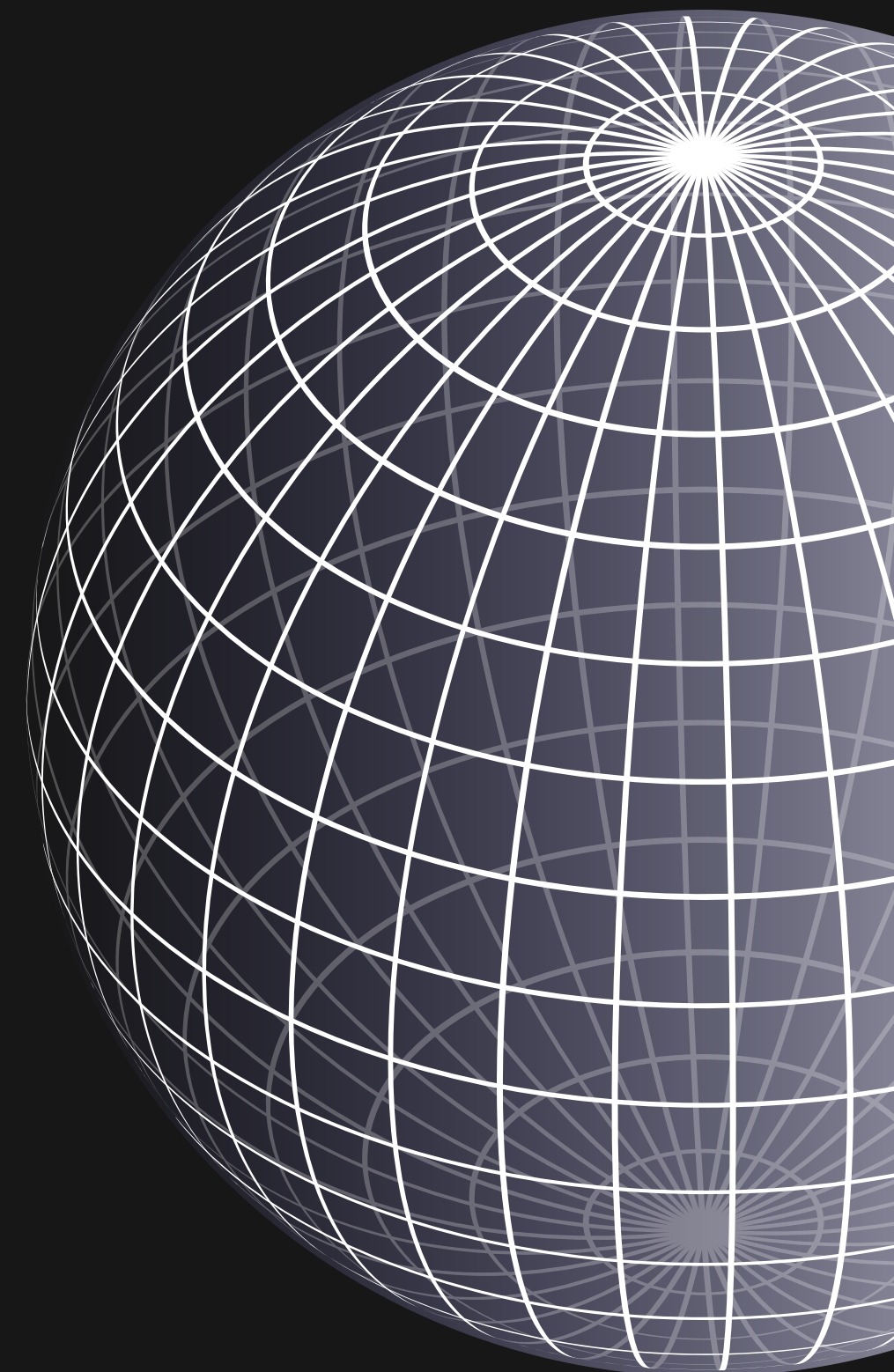




# WEHRL ENTROPY

Isaías Siliceo Guzmán

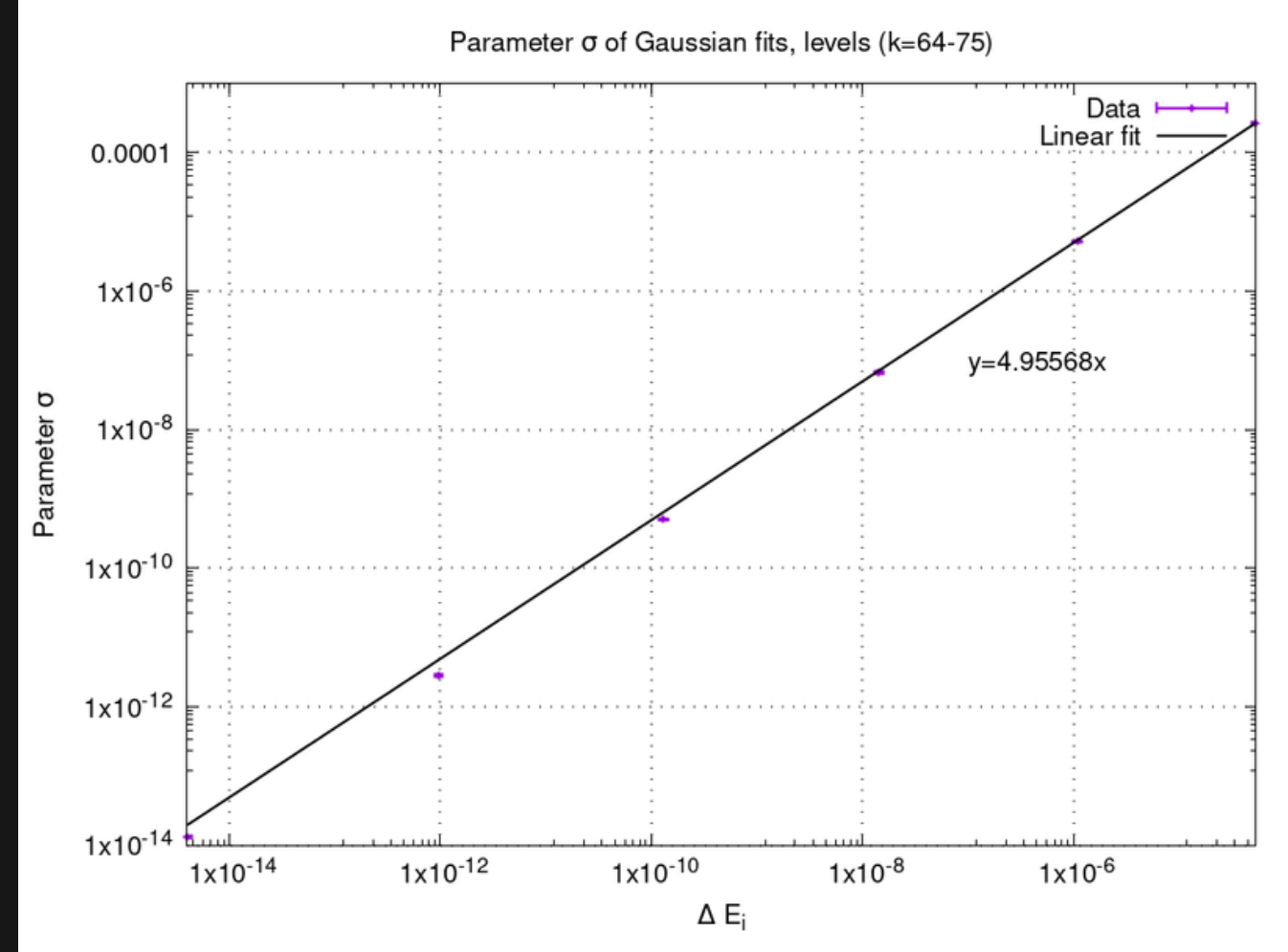
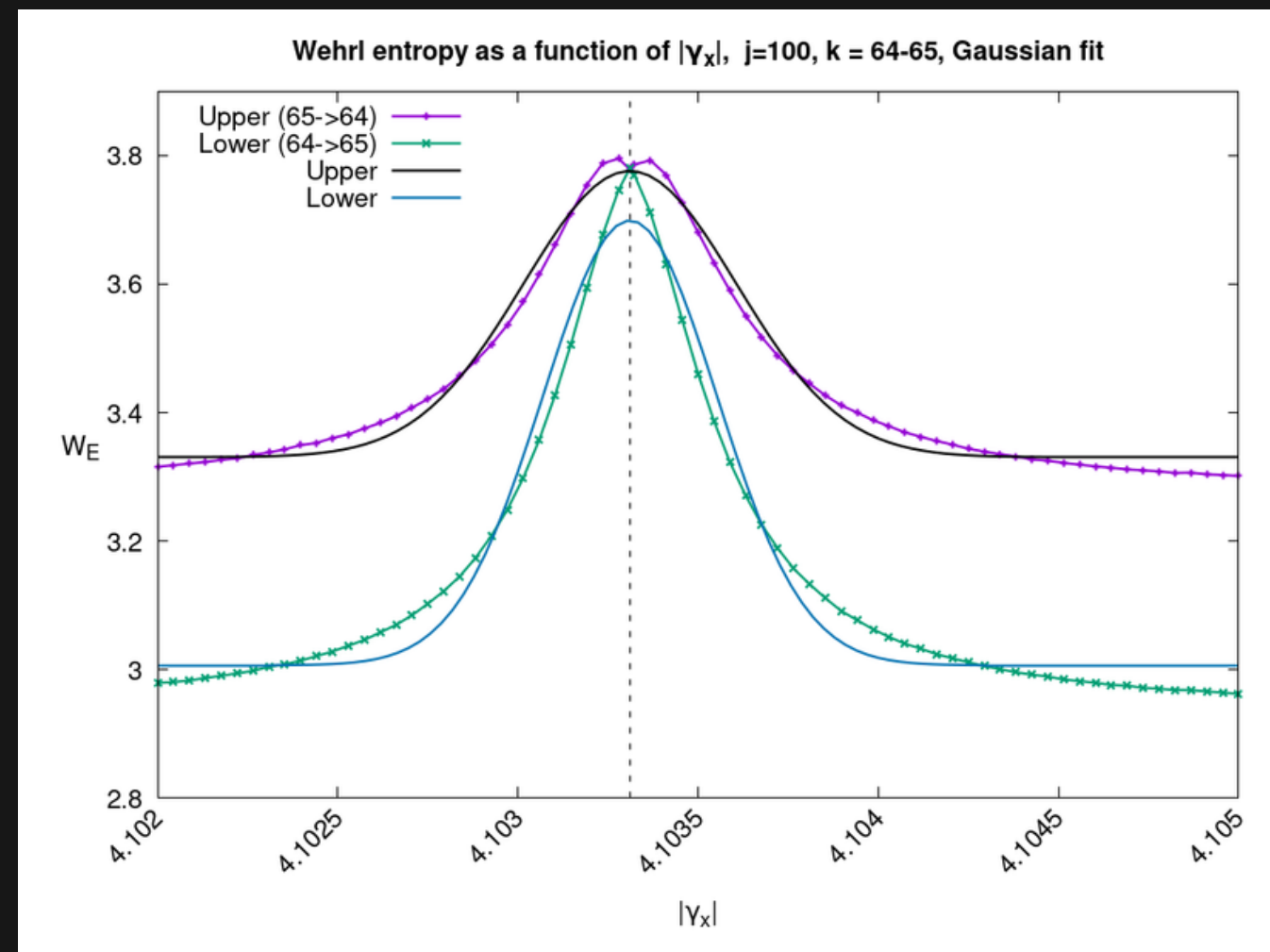


# ≡ Previous results:

- Wehrl Entropy around at AC:  
-4.103310841740555 (N=172)
- Gaussian fits to obtain parameter  $\sigma$   
(width)
- Linear fit

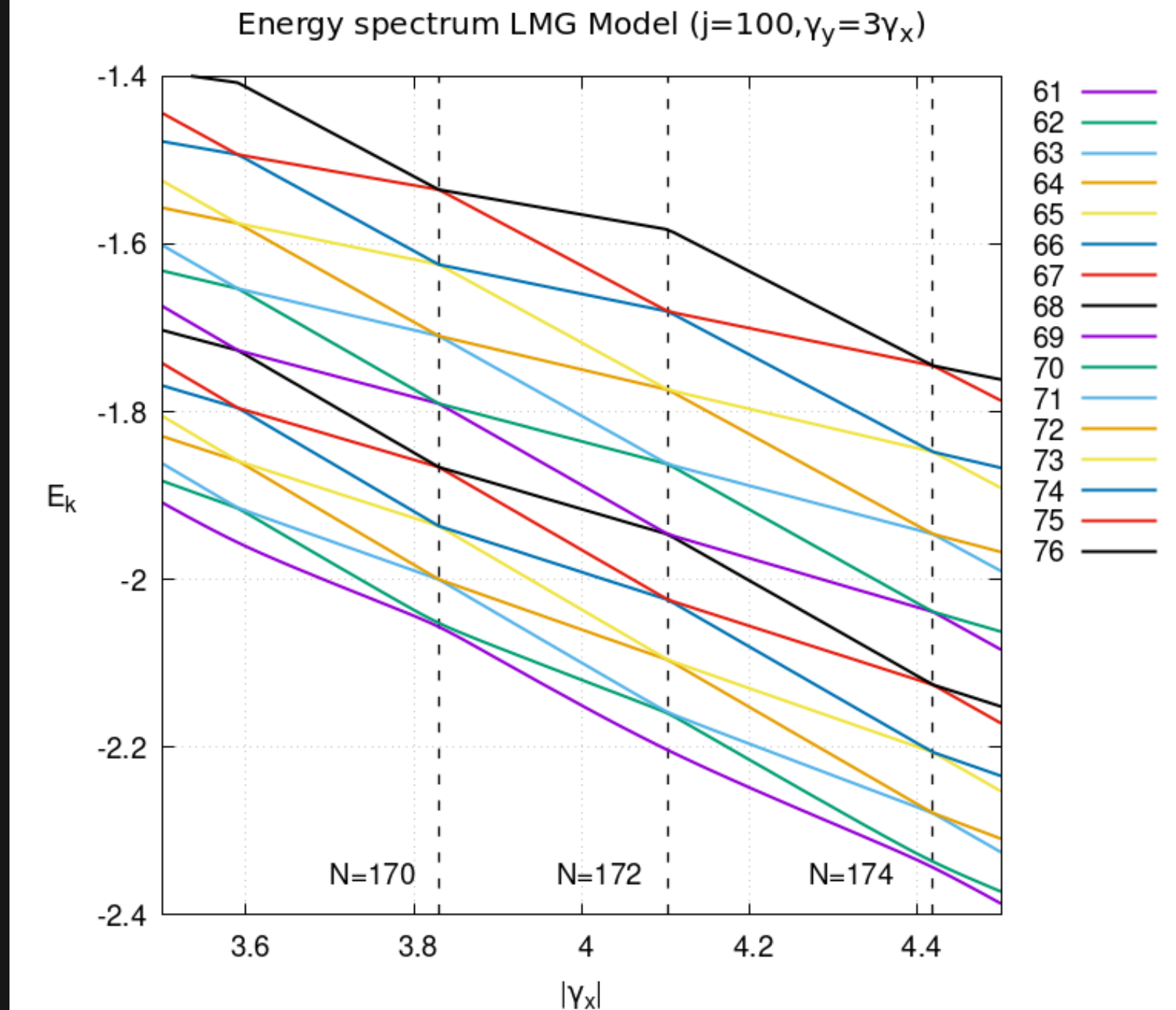
## Tasks of the week

- Explore the behavior of entropy at the  
ACs corresponding to N=170 & N=174.
- Gaussian fits / Obtain  $\sigma$
- Linear fit



# ≡ Remark:

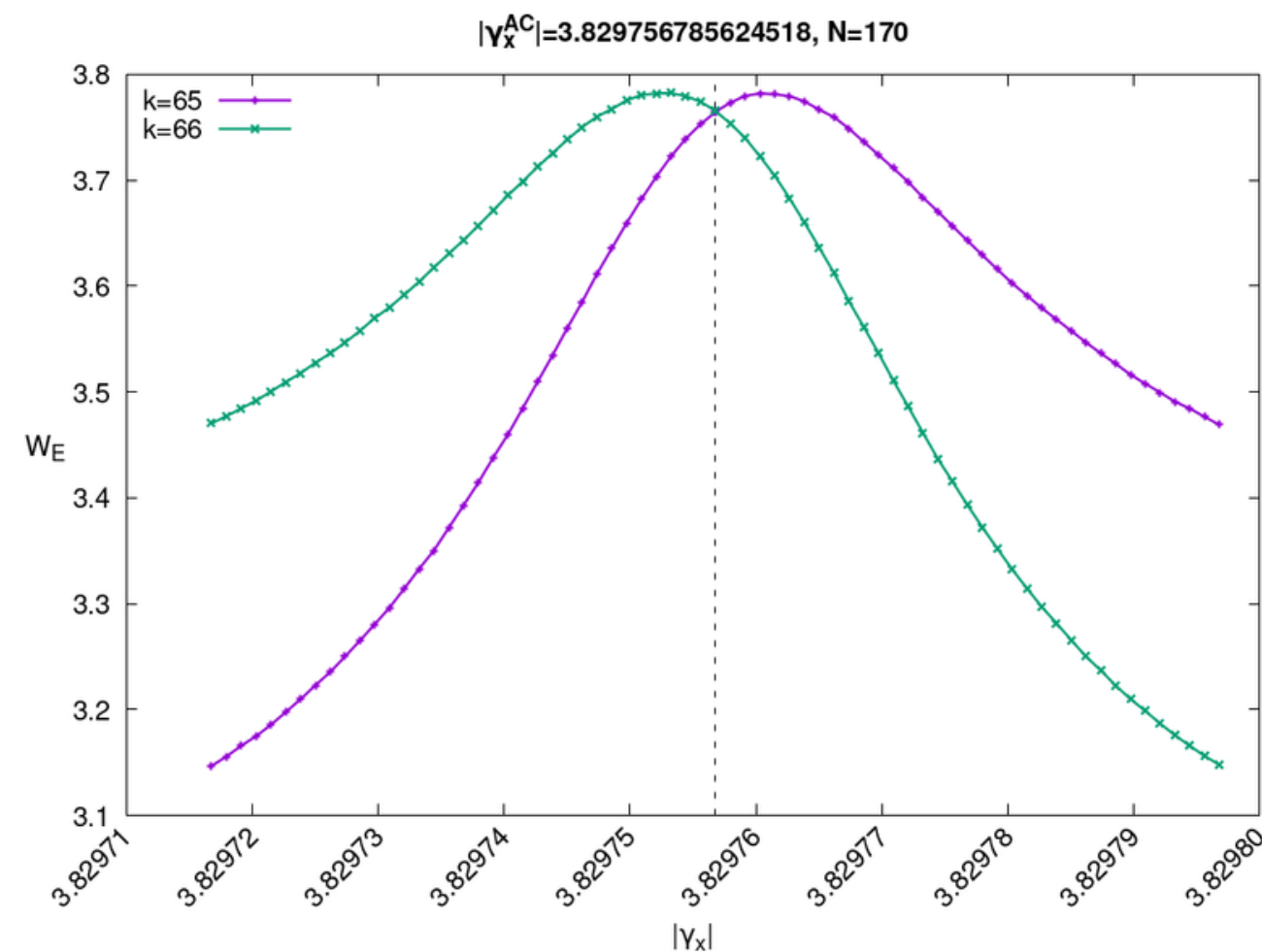
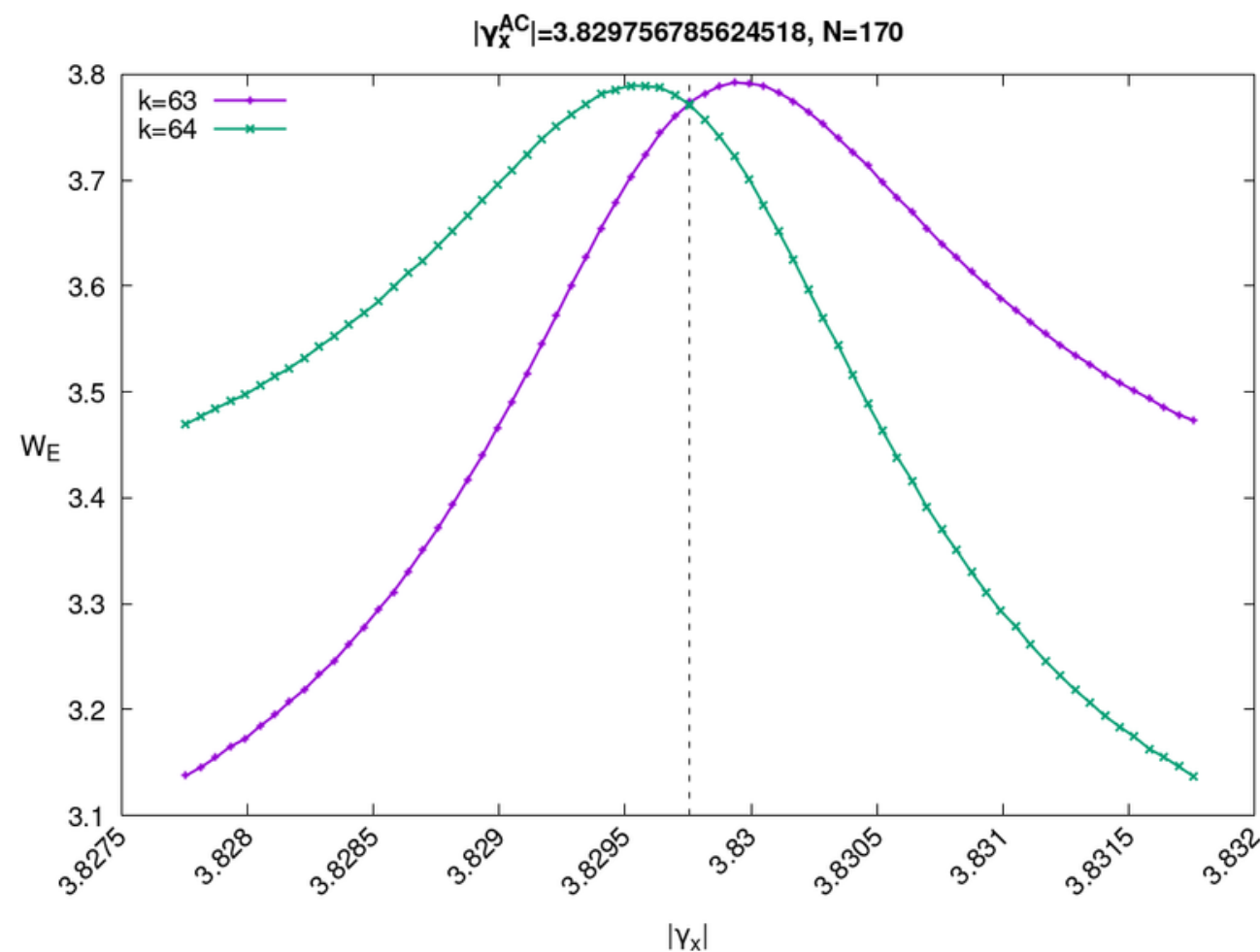
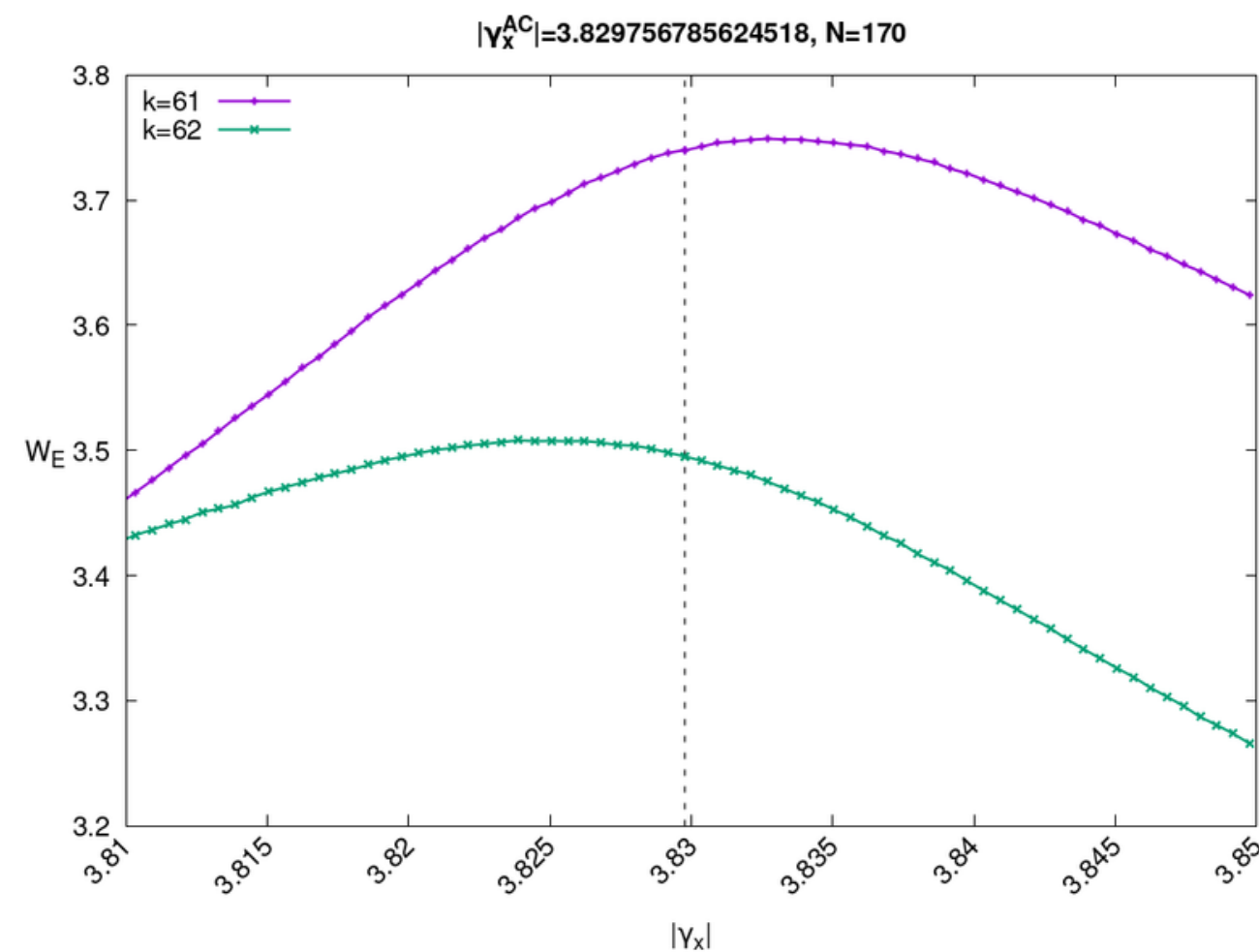
- ACs at  $N=170$  &  $174$  correspond to different pairs of levels.  
(61-62)  $\rightarrow$  (63-64)  $\rightarrow$  (65-66)  $\rightarrow$  ... (73-74)
- ACs at  $N=172$  correspond to the pairs  
(62-63)  $\rightarrow$  (64,65)  $\rightarrow$  (66-67)  $\rightarrow$  ... (74-75)

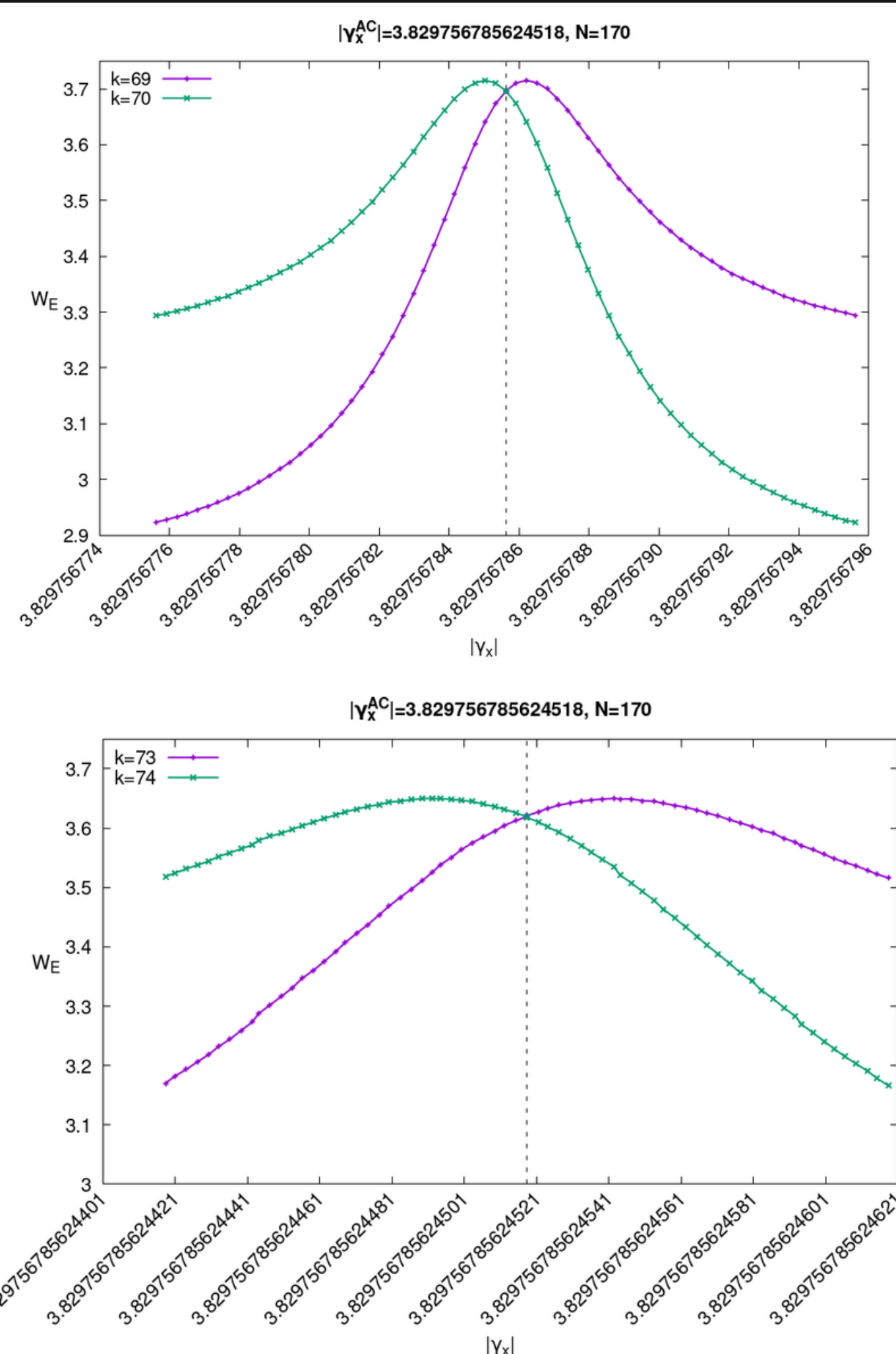
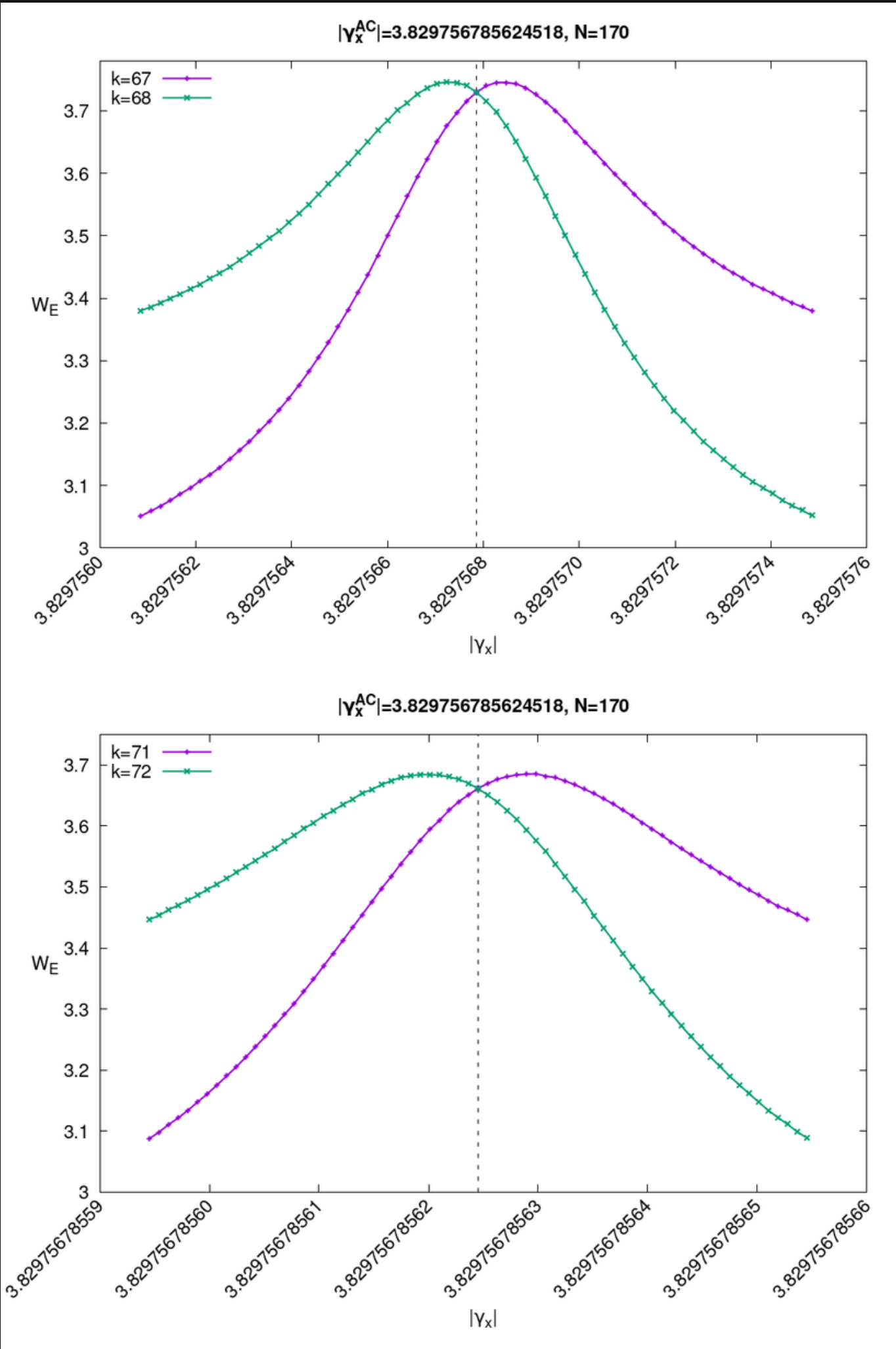


≡

# Wehrl Entropy (N=170)

3



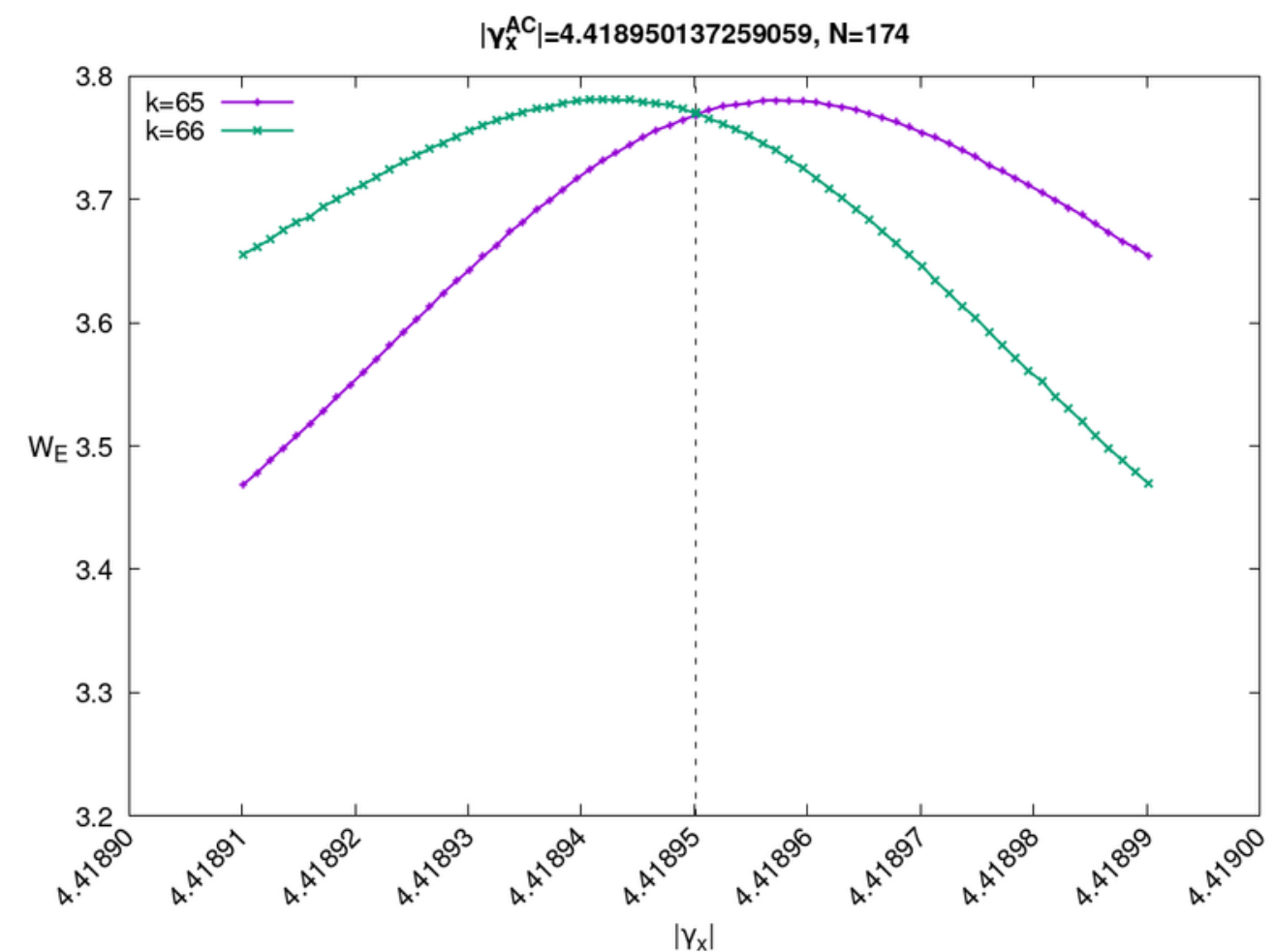
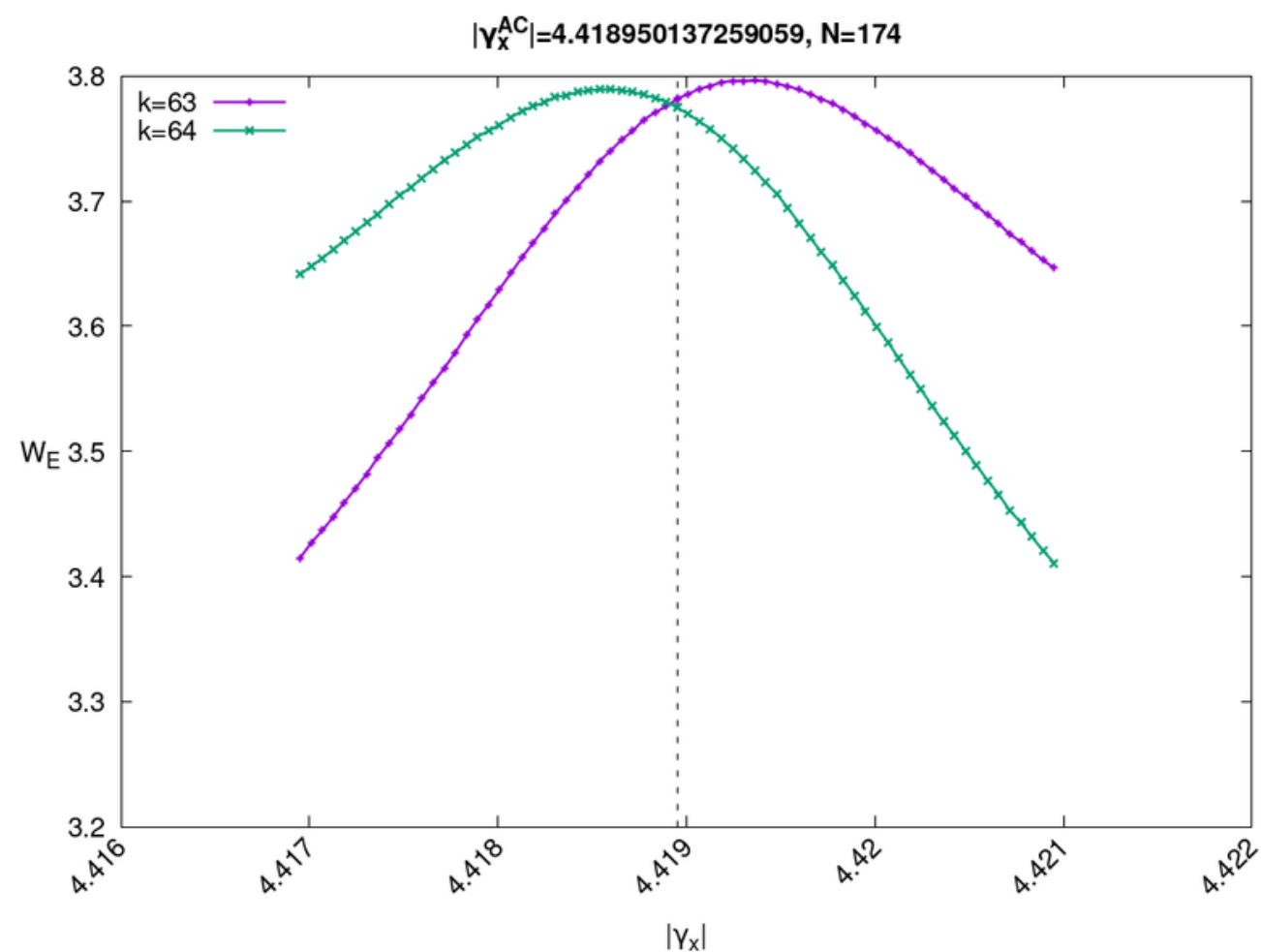
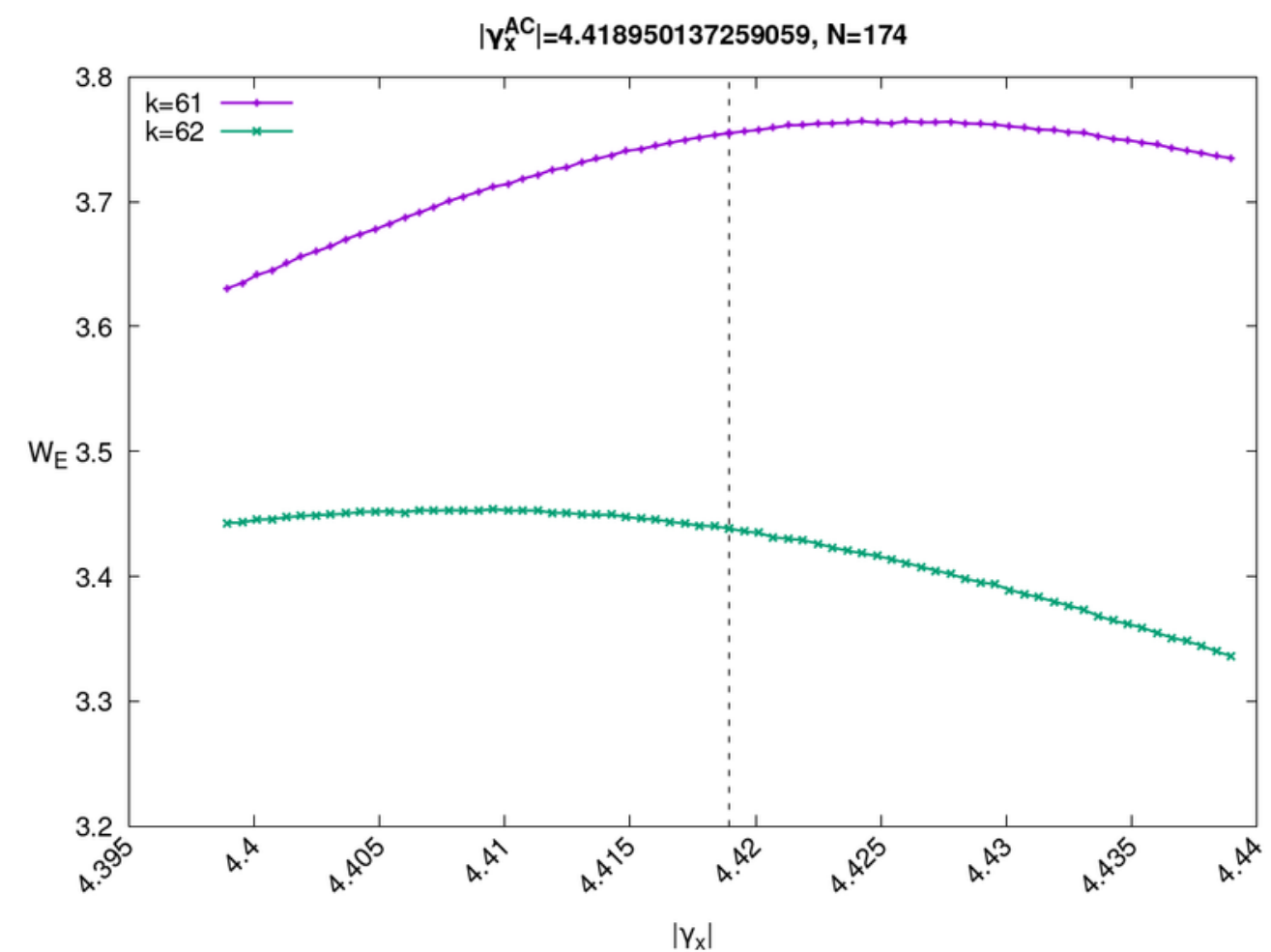


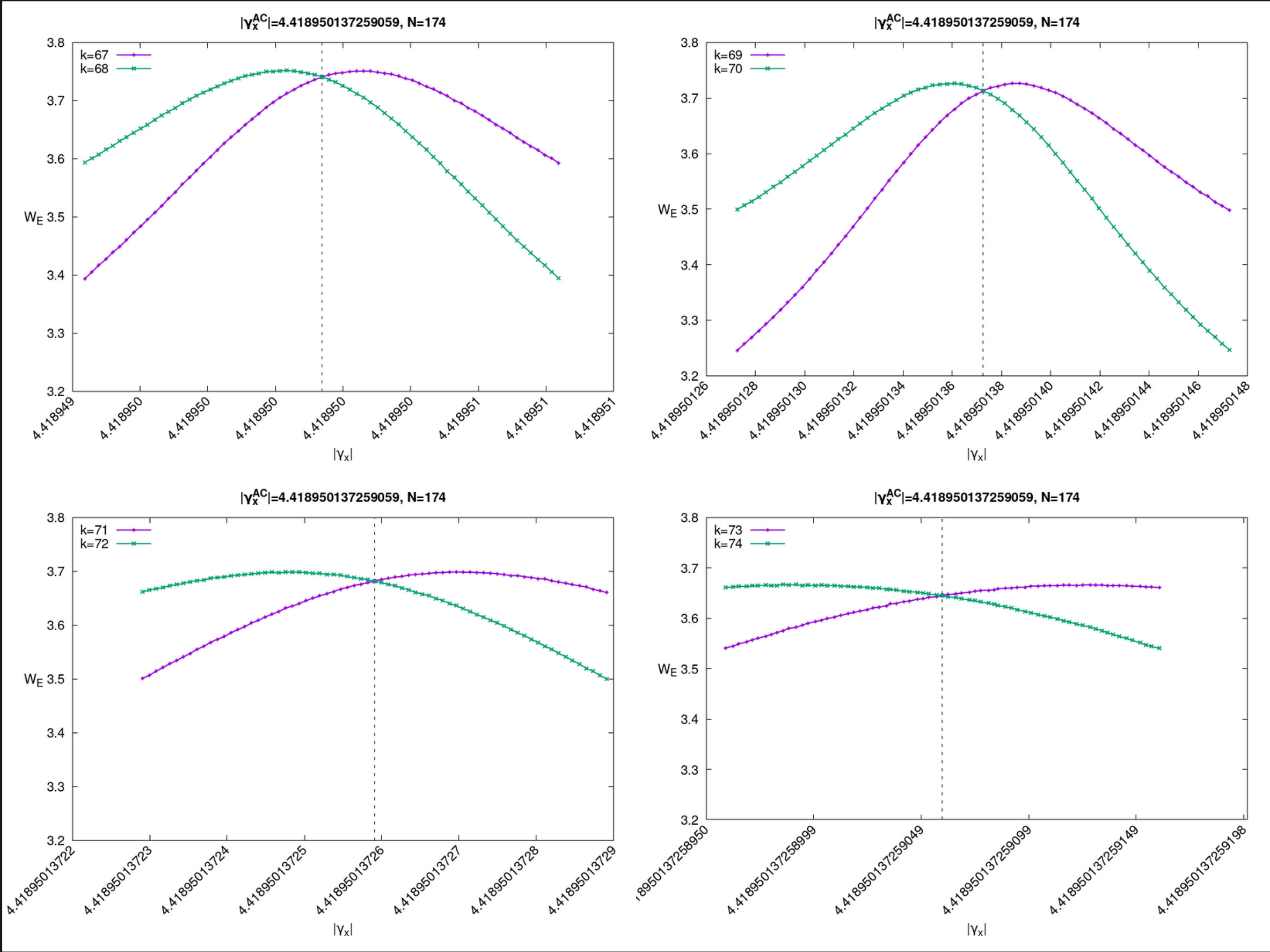


≡

# Wehrl Entropy (N=174)

5

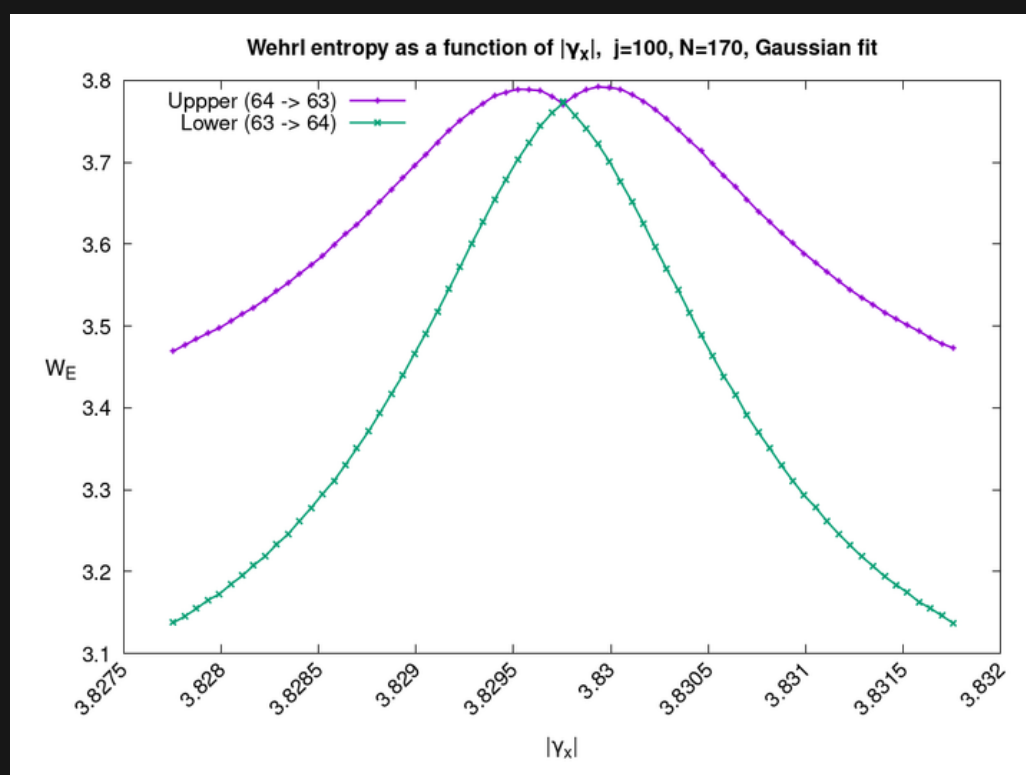
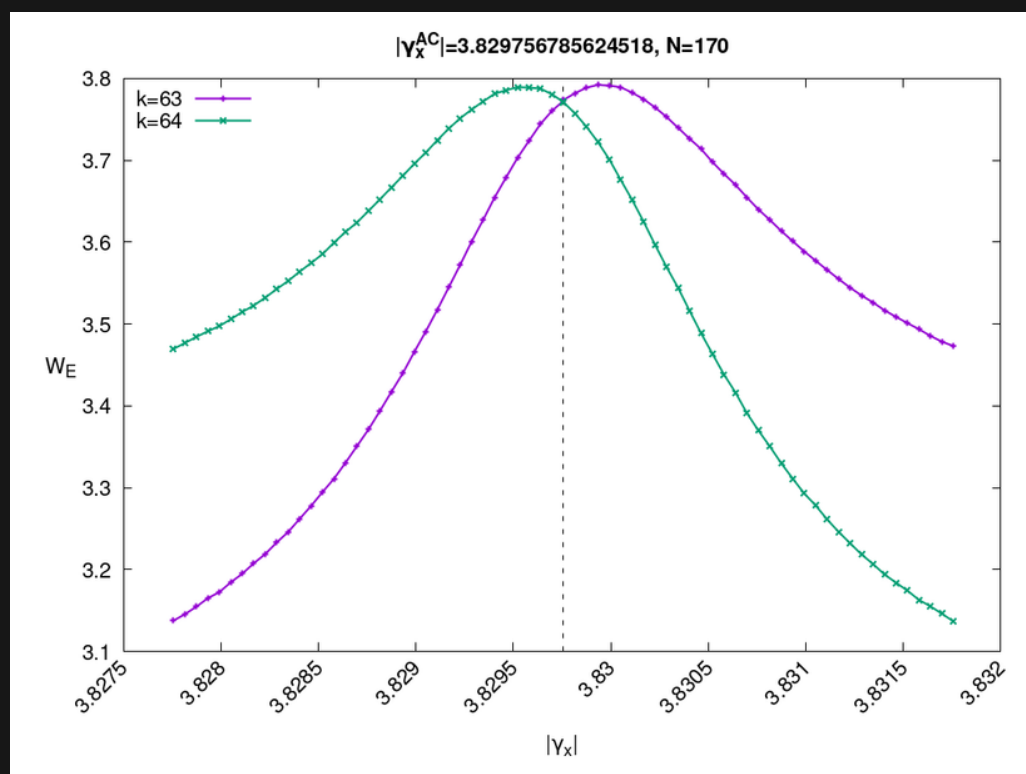






# Example of data handling

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## Model: Gaussian function

$$g(x) = h + \frac{a}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

Assumptions:

$$\mu_1 = 3.829756785624518$$

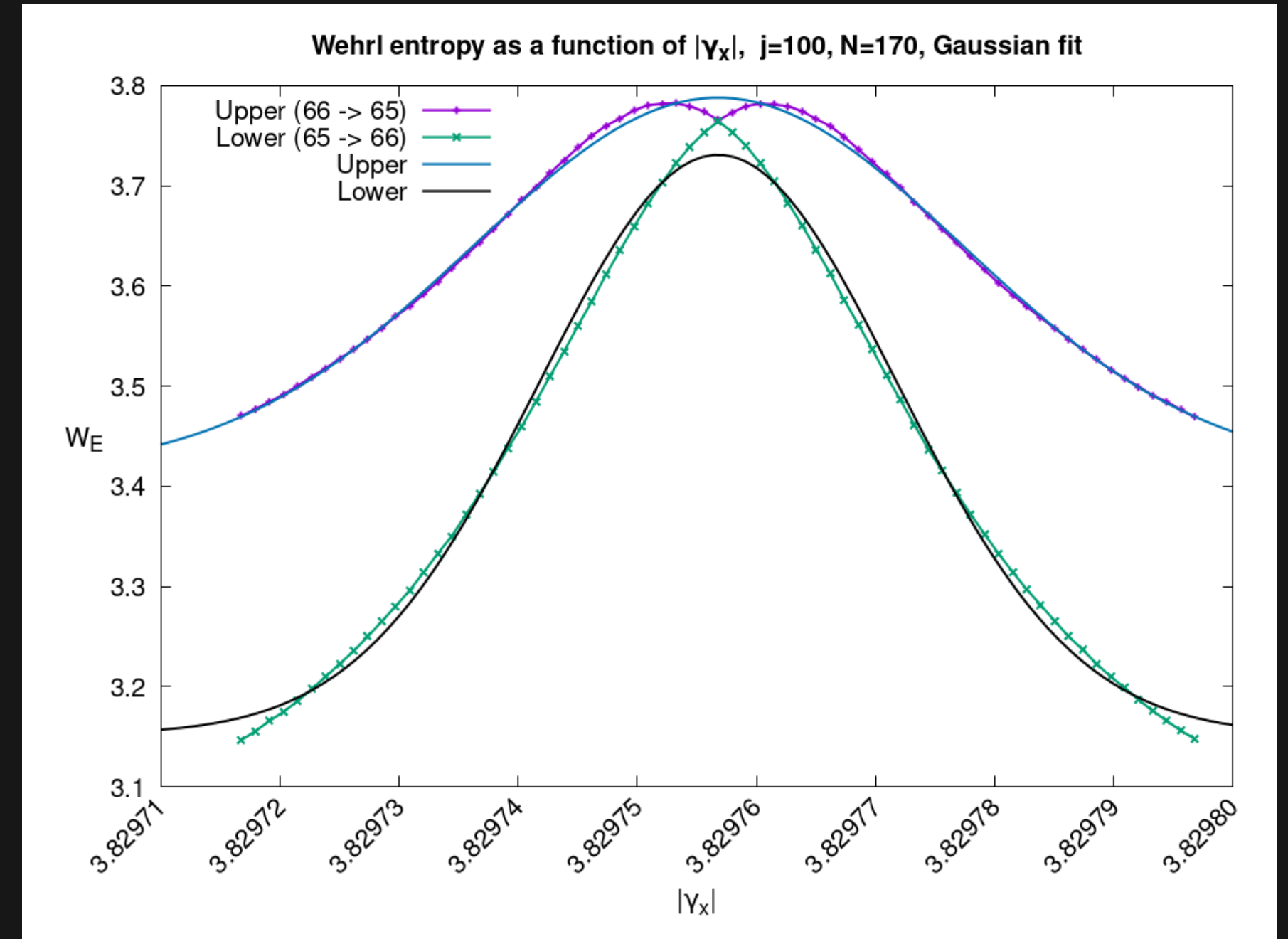
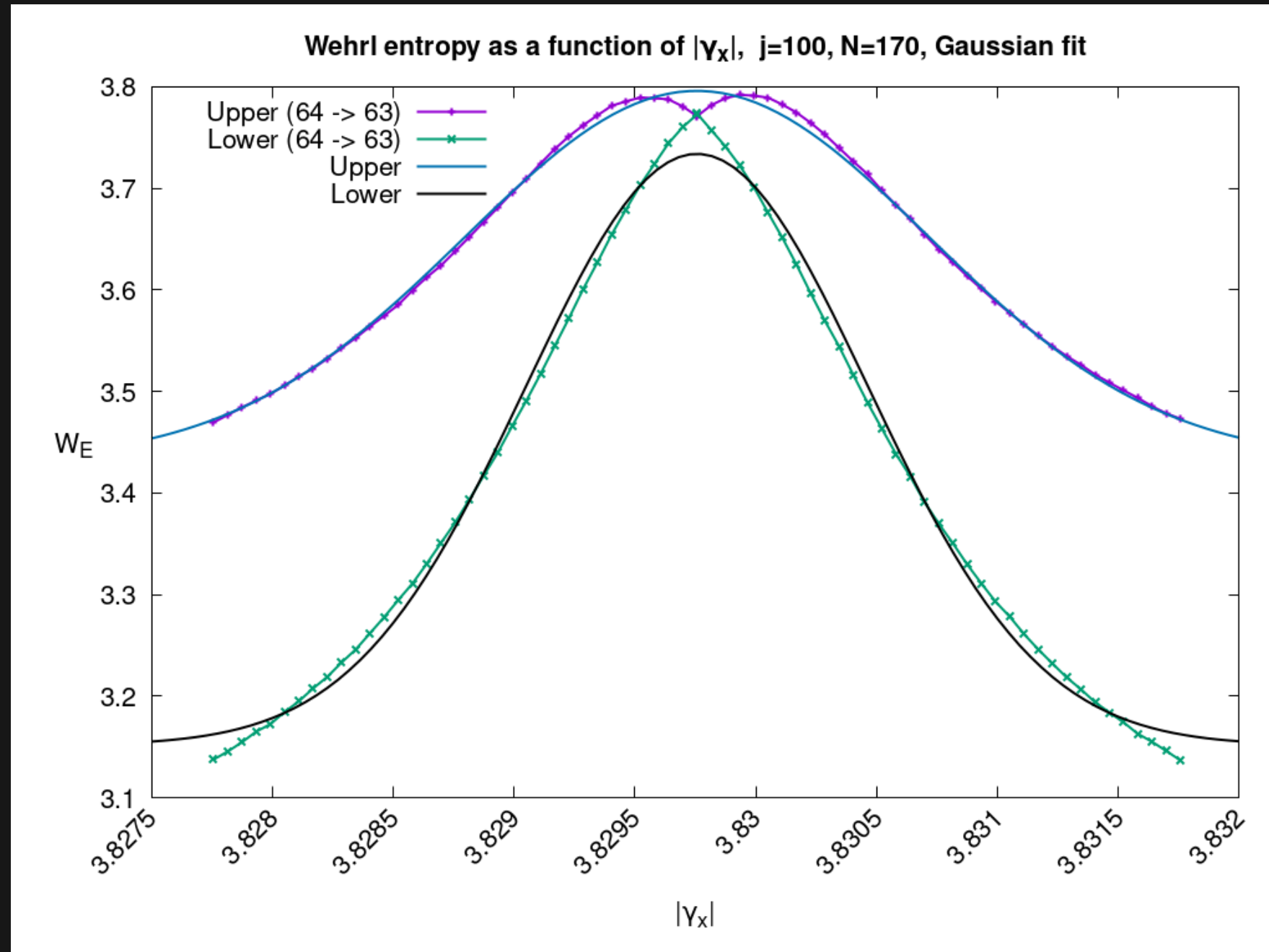
$$\mu_2 = 4.103310841740555$$

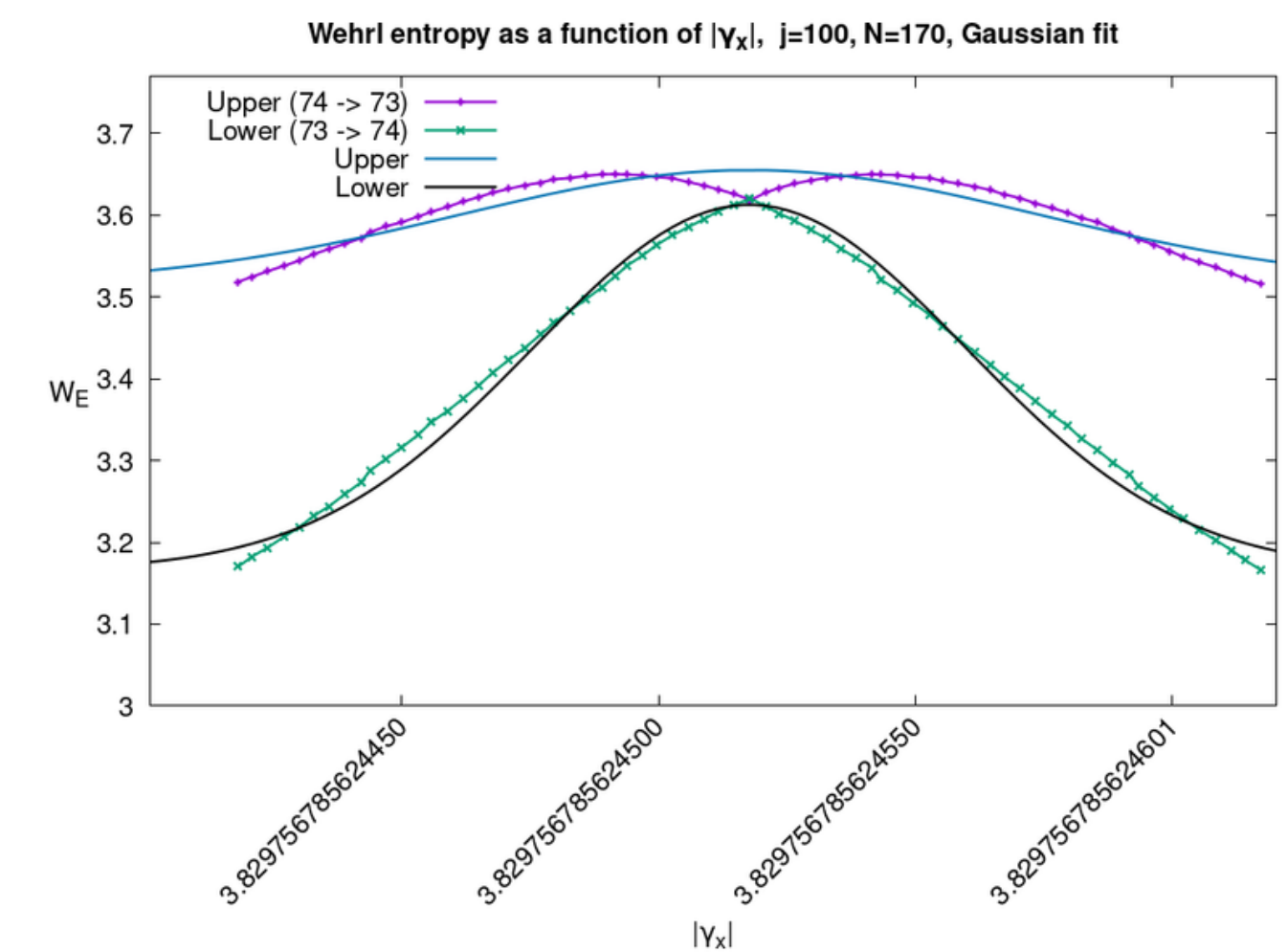
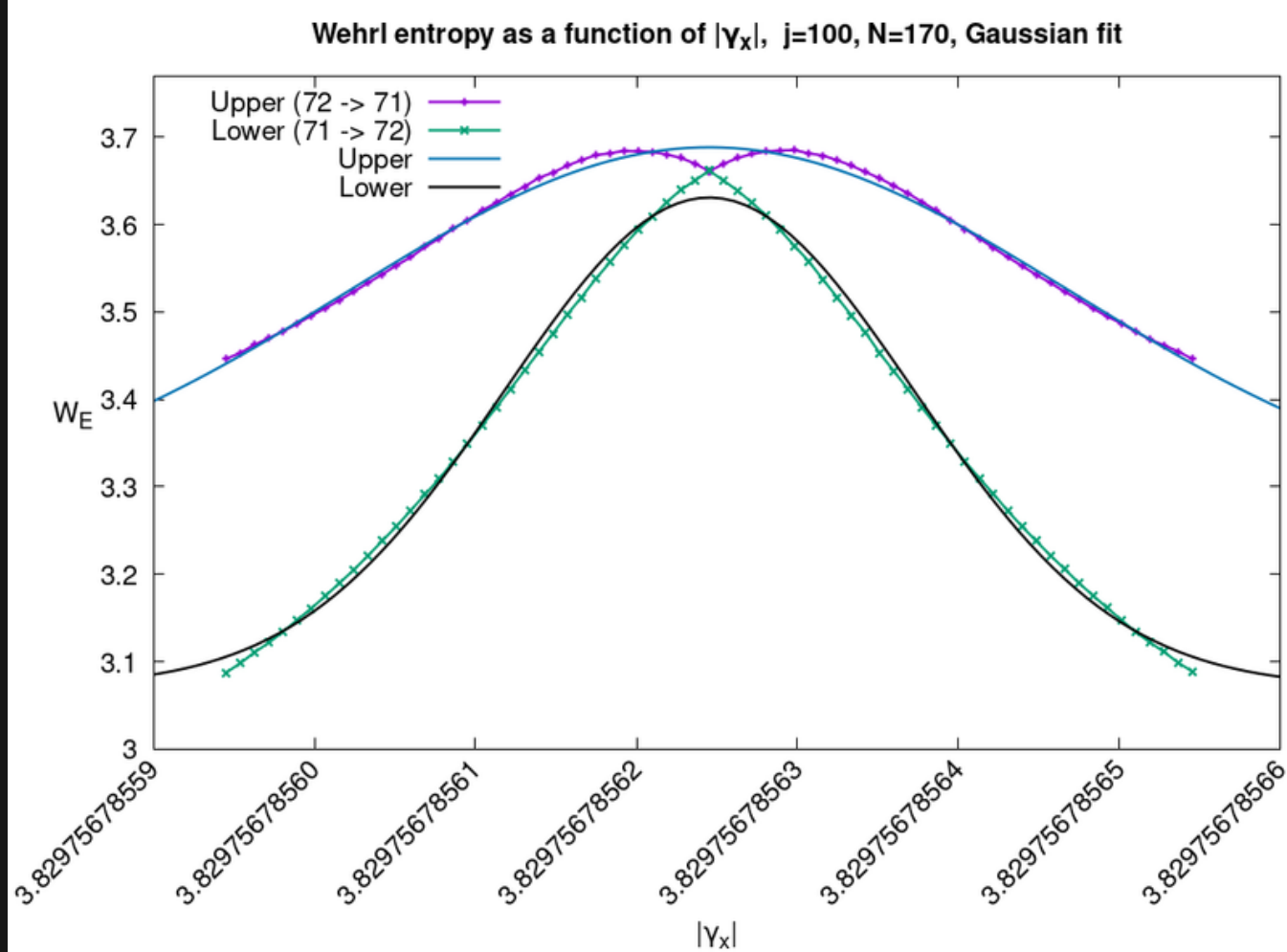
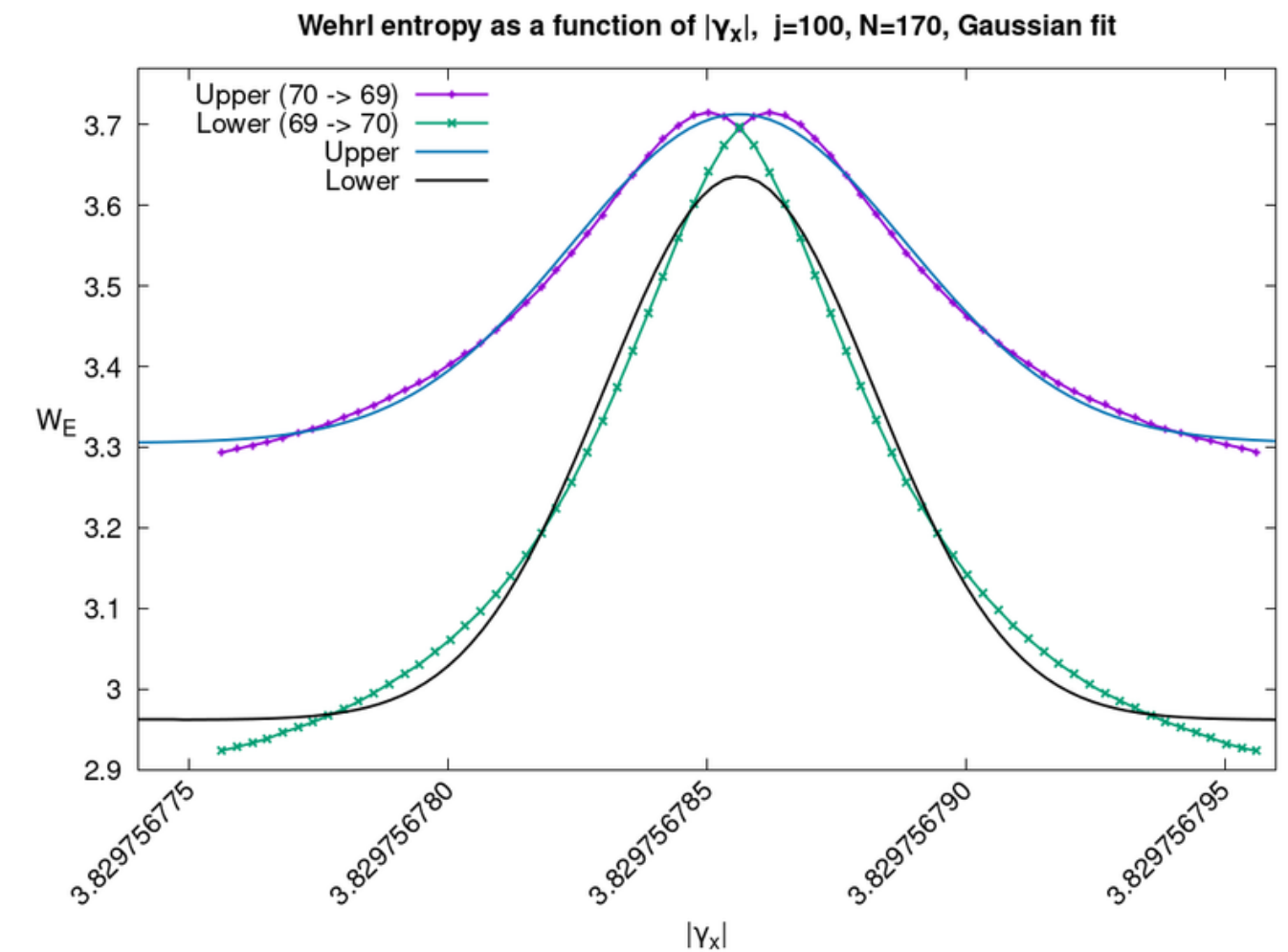
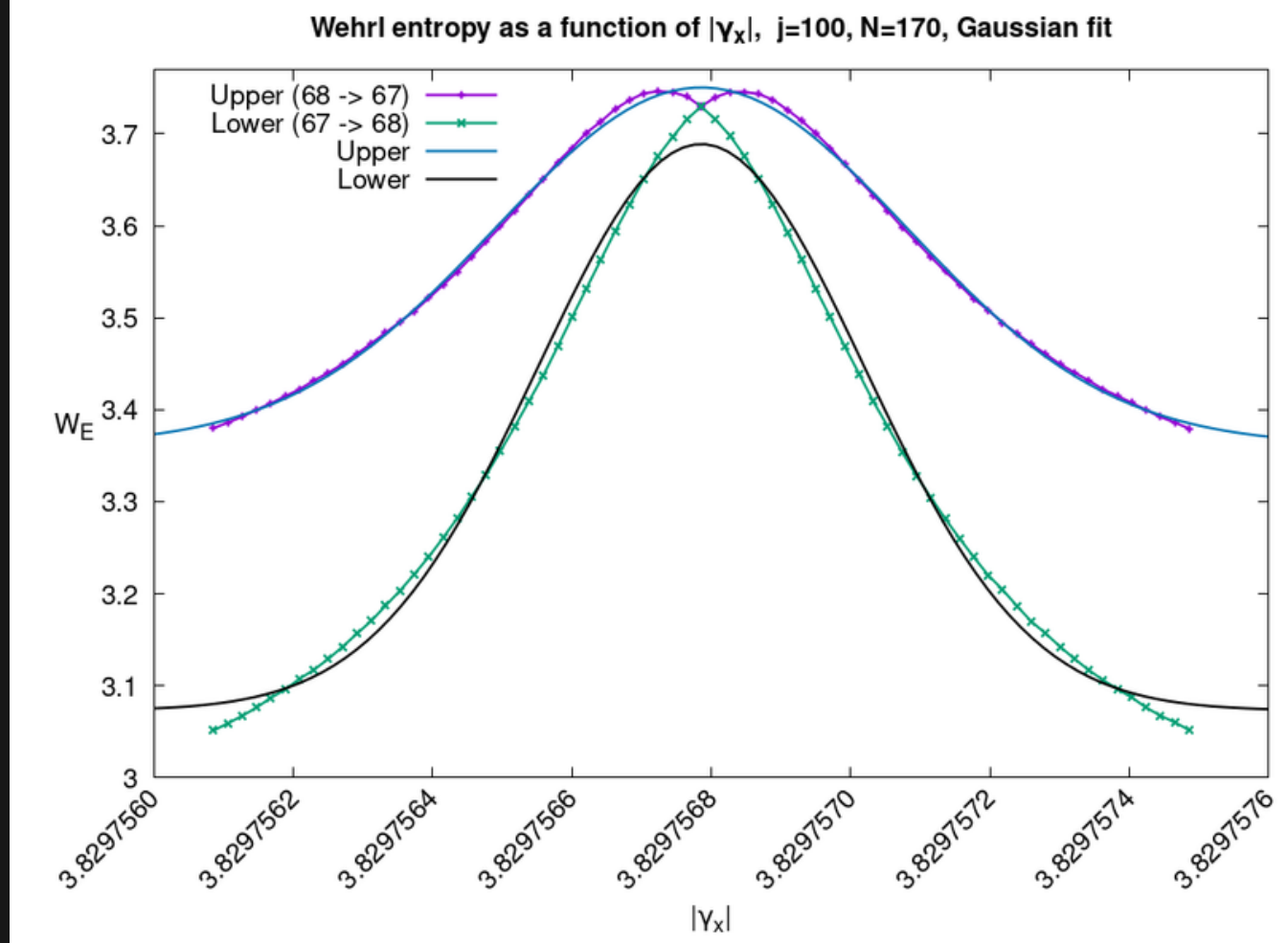
$$\mu_3 = 4.418950137259059$$



# ≡ Gaussian fits at AC: -3.829756785624518

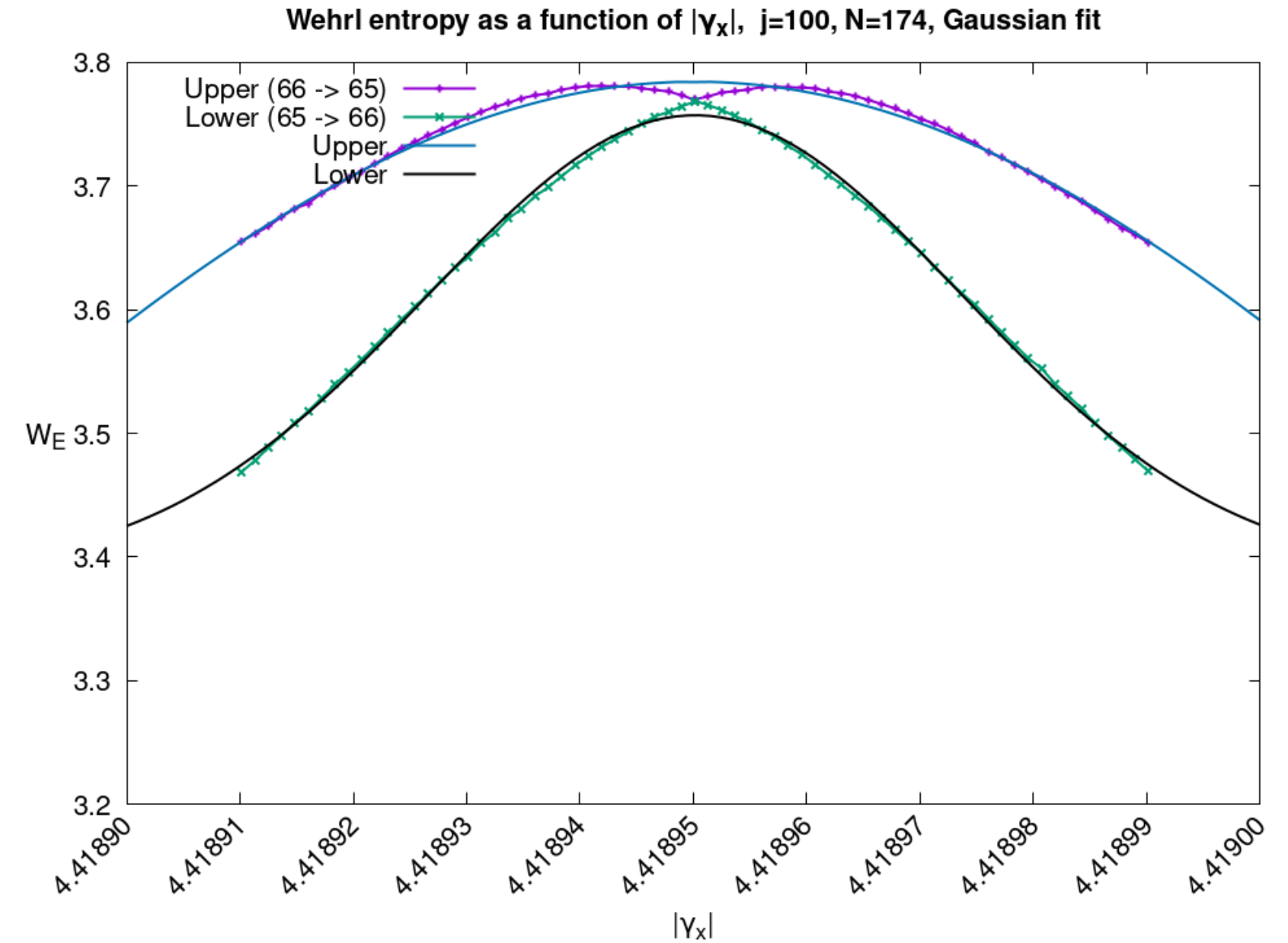
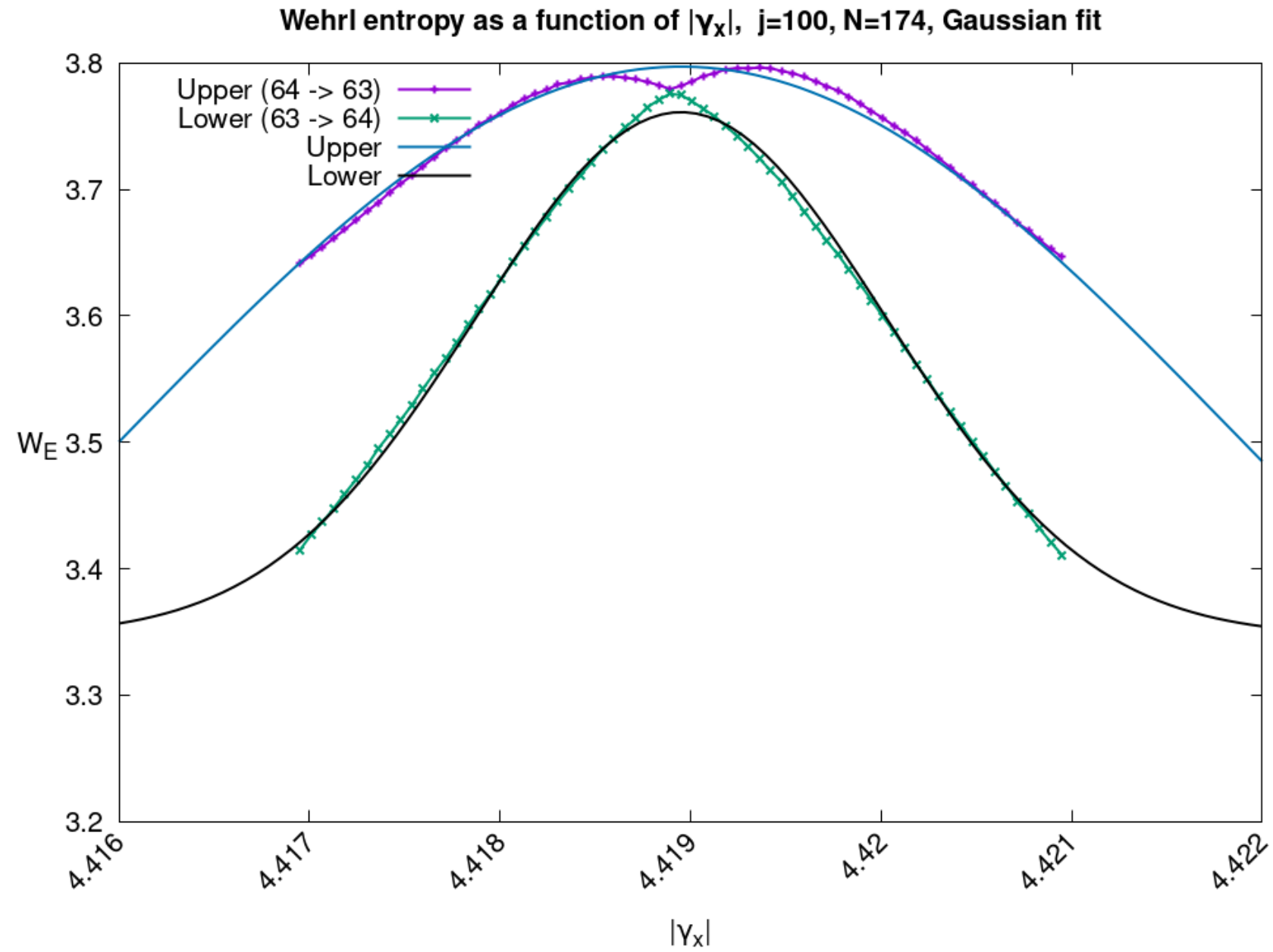
8

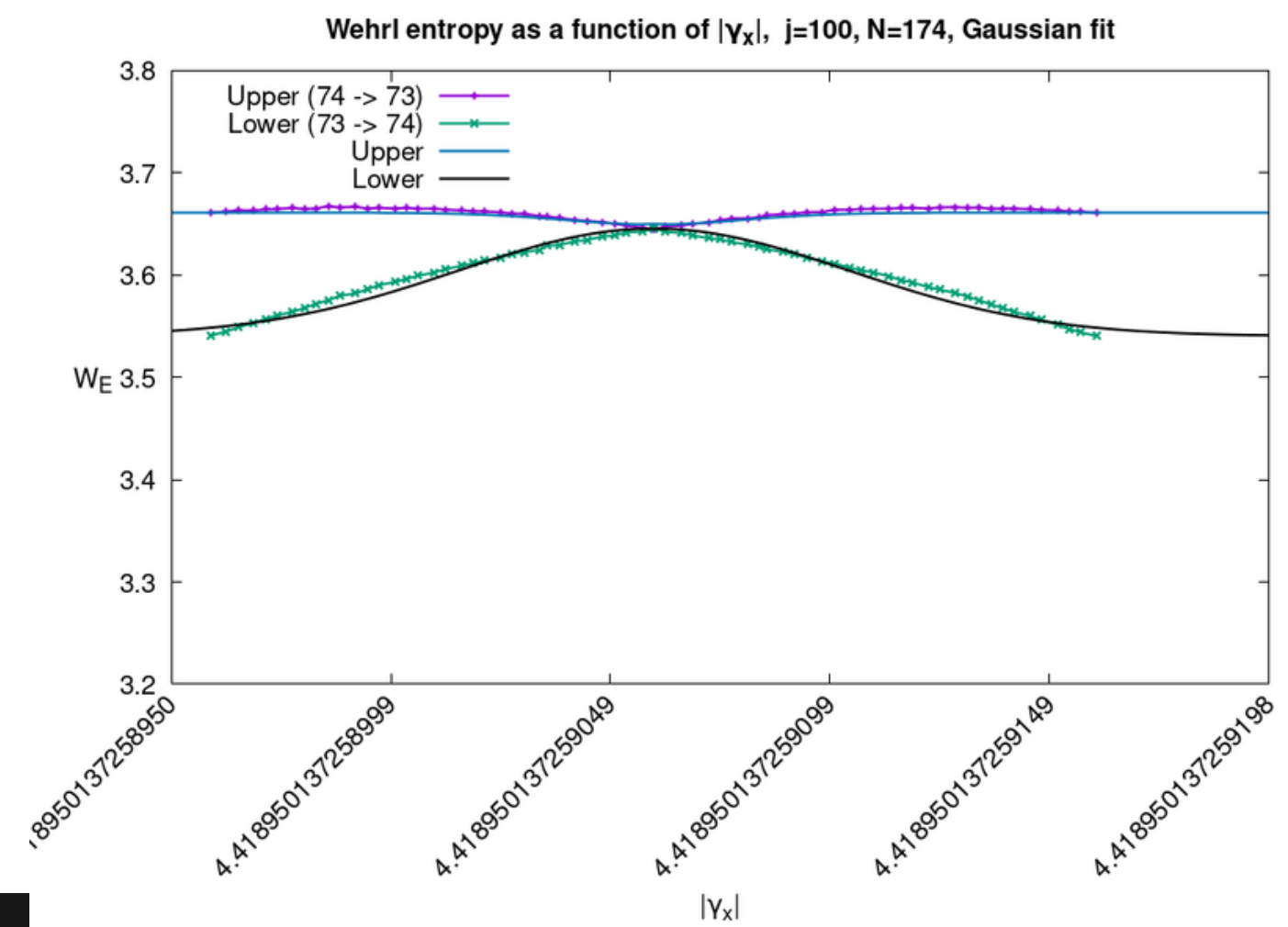
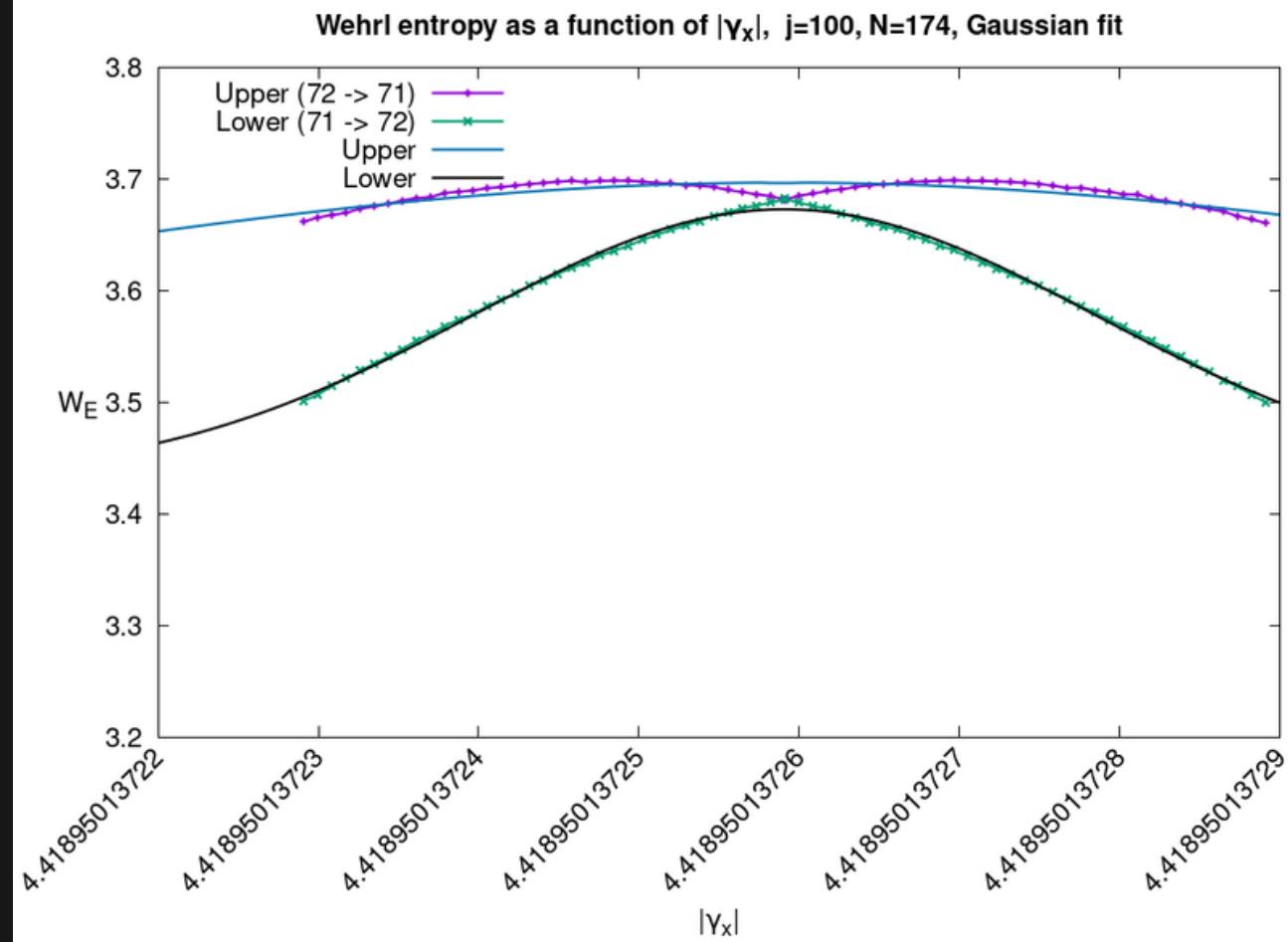
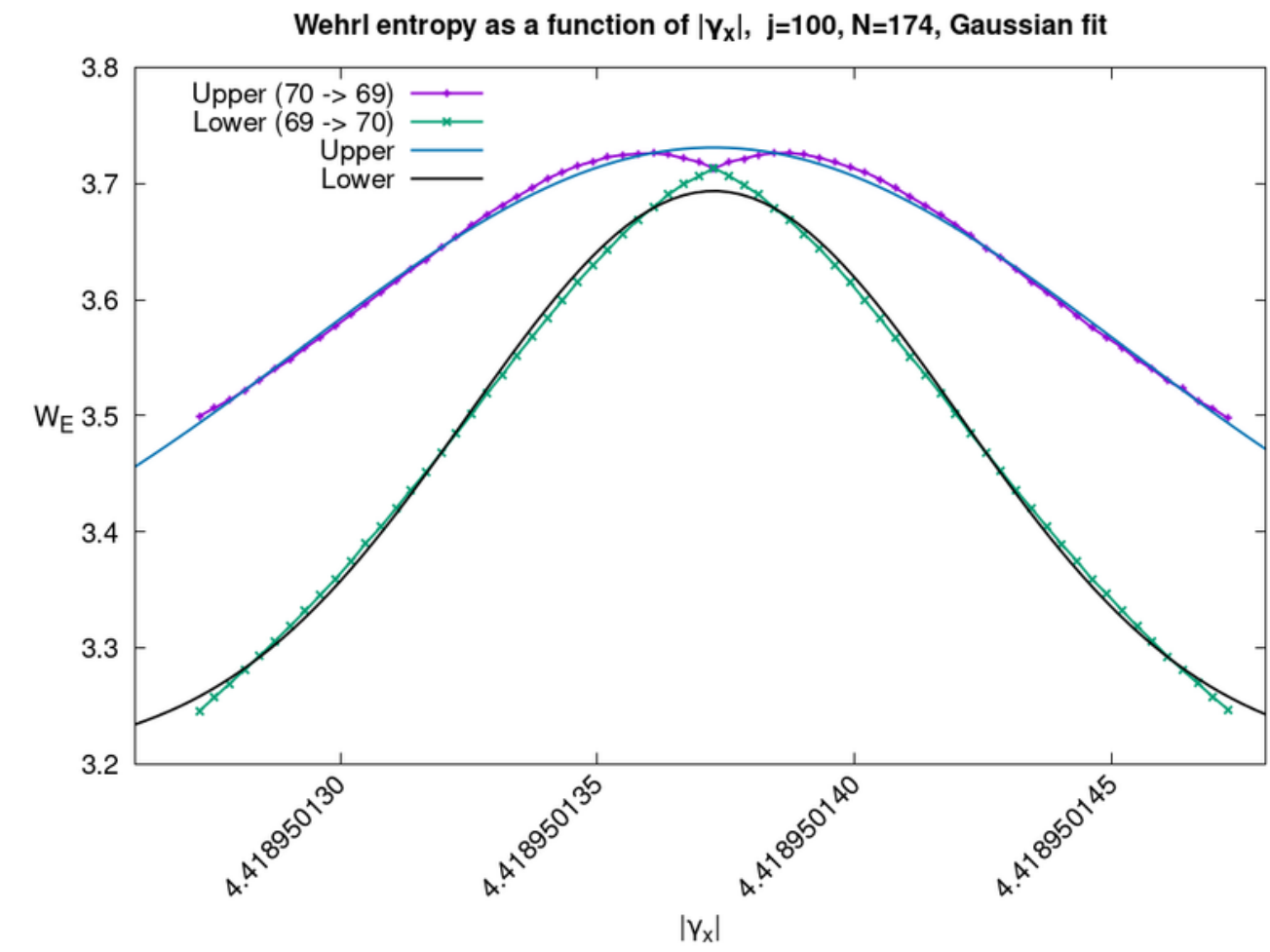
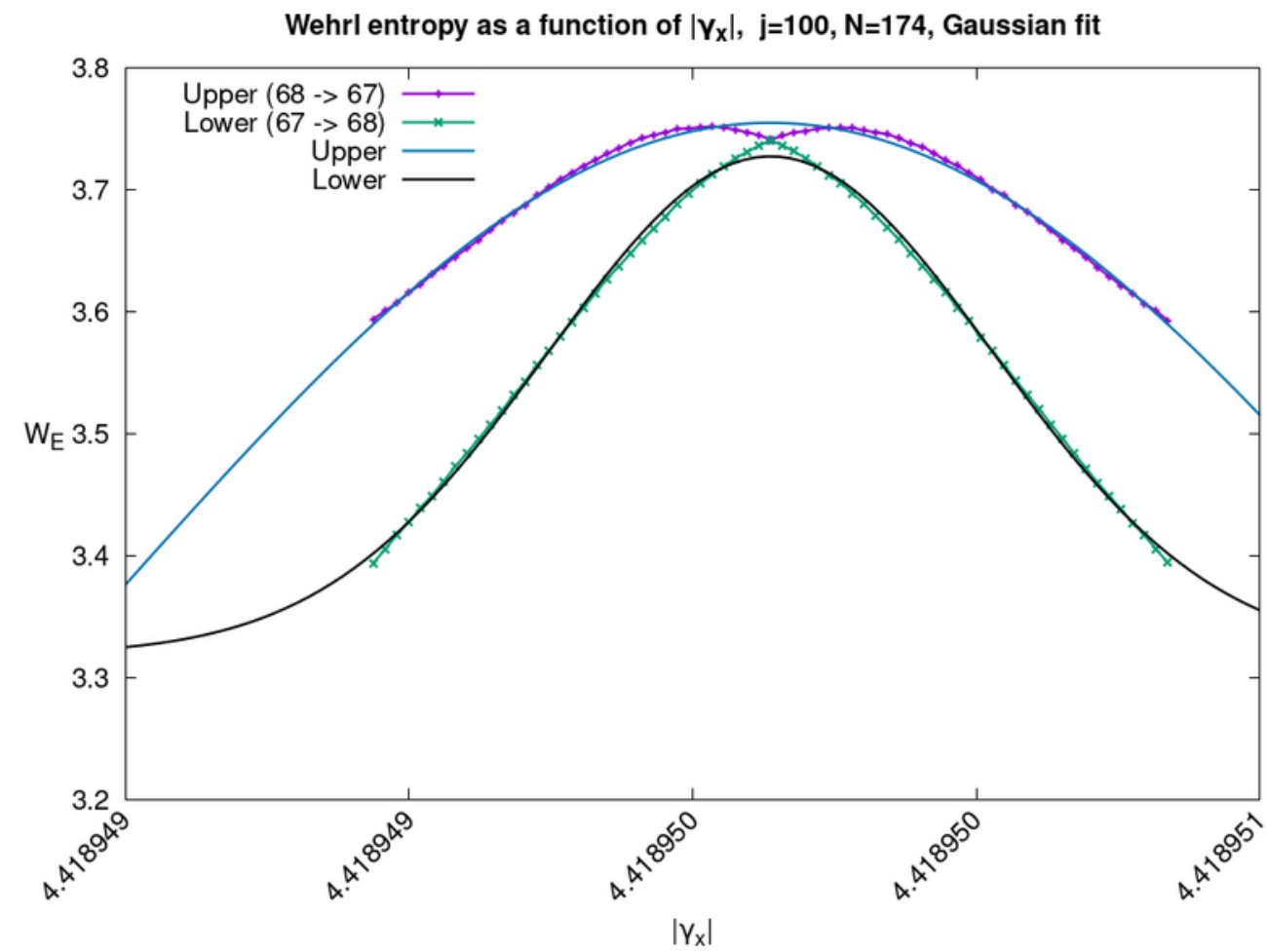




# ≡ Gaussian fits at AC: -4.418950137259059

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# Parameters:

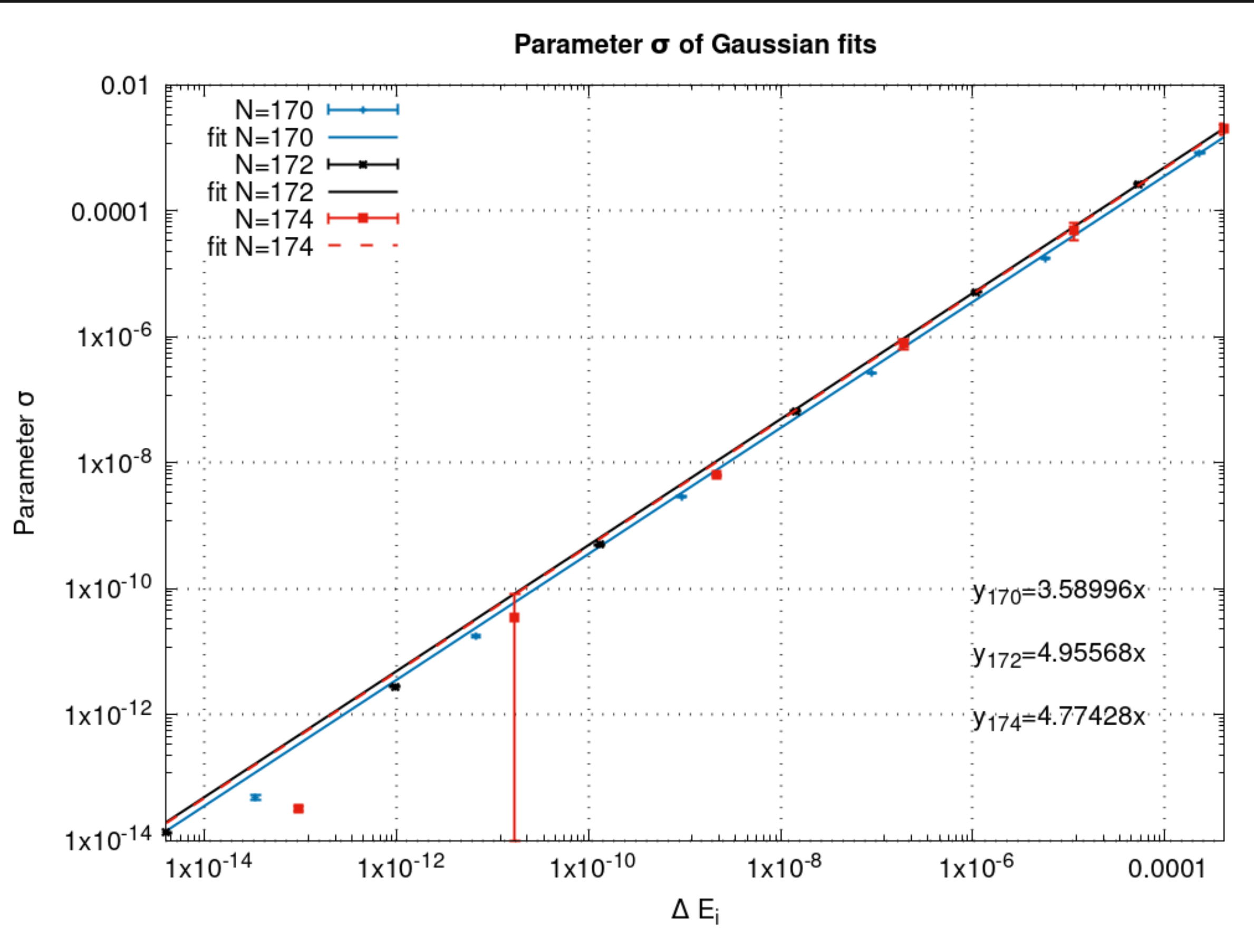
12

# Data set of parameters, Gaussian fits, N=170					
# h	delta_h	a	delta_a	sigma	delta_sigma
3.43084	0.005248	0.000877788	2.432e-05	0.000958985	1.505e-05
3.15175	0.005387	0.00103284	2.113e-05	0.000707681	1.033e-05
3.41431	0.006034	1.91668e-05	5.82e-07	2.04645e-05	3.351e-07
3.15251	0.005376	2.17781e-05	4.348e-07	1.50172e-05	2.051e-07
3.36199	0.003048	2.87364e-07	4.59e-09	2.95211e-07	2.954e-09
3.07311	0.005335	3.61334e-07	7.116e-09	2.34133e-07	3.413e-09
3.3052	0.00248	3.30244e-09	4.644e-11	3.22995e-09	3.434e-11
2.96178	0.005732	4.42124e-09	9.651e-11	2.61611e-09	4.794e-11
3.27011	0.03206	2.35089e-11	3.04e-12	2.24162e-11	1.241e-12
3.07144	0.006176	1.77997e-11	3.993e-13	1.26903e-11	1.779e-13
3.516	0.0226	1.97568e-14	5.826e-15	5.66792e-14	8.371e-15
3.1661	0.008391	4.74404e-14	1.811e-15	4.23824e-14	1.011e-15
# Data set of parameters, Gaussian fits, N=174					
# h	delta_h	a	delta_a	sigma	delta_sigma
3.04851	0.3463	0.00550779	0.003951	0.00293454	0.0007522
3.34677	0.007228	0.00112012	3.603e-05	0.00107808	1.808e-05
2.81963	0.7054	0.000180411	0.0002021	7.45986e-05	2.91e-05
3.38596	0.006763	2.19936e-05	7.176e-07	2.36276e-05	3.759e-07
2.75675	0.4216	2.91159e-06	1.894e-06	1.16382e-06	2.664e-07
3.31888	0.006448	4.01245e-07	1.154e-08	3.91909e-07	5.698e-09
3.29174	0.02874	8.82819e-09	9.61e-10	8.01937e-09	3.623e-10
3.20369	0.005764	5.85315e-09	1.331e-10	4.76776e-09	6.169e-11
3.52669	0.6061	2.16213e-11	1.186e-10	5.07111e-11	9.77e-11
3.43149	0.00736	1.17554e-11	6.257e-13	1.94296e-11	4.766e-13
3.6609	0.0006264	-5.81757e-16	9.184e-17	2.01773e-14	2.913e-15
3.5403	0.00362	1.17143e-14	8.018e-16	4.44085e-14	1.83e-15



# Linear fits of $\sigma$ vs. $\Delta E_i$ at 3 AC

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# Data set:

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#DeltaE	sigma_mean	error_sigma
# 170		
0.00023210943059104316	0.000833333	1.2689999999999999e-05
5.728554369088812e-06	1.774085e-05	2.7009999999999996e-07
8.871973378177245e-08	2.64672e-07	3.1835e-09
9.257190569655904e-10	2.92303e-09	4.114e-11
6.70108413203252e-12	1.755325e-11	7.094500000000001e-13
3.397282455352979e-14	4.95308e-14	4.691e-15
# 172		
5.409770307096551e-05	0.000268095	5.898e-06
1.0889340389397262e-06	5.18156e-06	1.312e-07
1.4359958999676792e-08	6.64837e-08	1.881e-09
1.302400409741722e-10	5.07879e-10	1.126e-11
9.610090501155355e-13	2.81172e-12	9.7815e-14
3.9968028886505635e-15	1.3376535e-14	5.281e-16
#174		
0.0004202044823027329	0.00200631	0.00038513999999999996
1.1332894974014351e-05	4.9113099999999996e-05	1.473795e-05
1.9017495134221463e-07	7.778645e-07	1.36049e-07
2.1547750250761055e-09	6.3935649999999995e-09	2.11995e-10
1.7064127888488656e-11	3.5070349999999997e-11	4.9088299999999996e-11
9.481304630298837e-14	3.22929e-14	2.3715e-15