A_LR measurement using e+e- to gamma Z
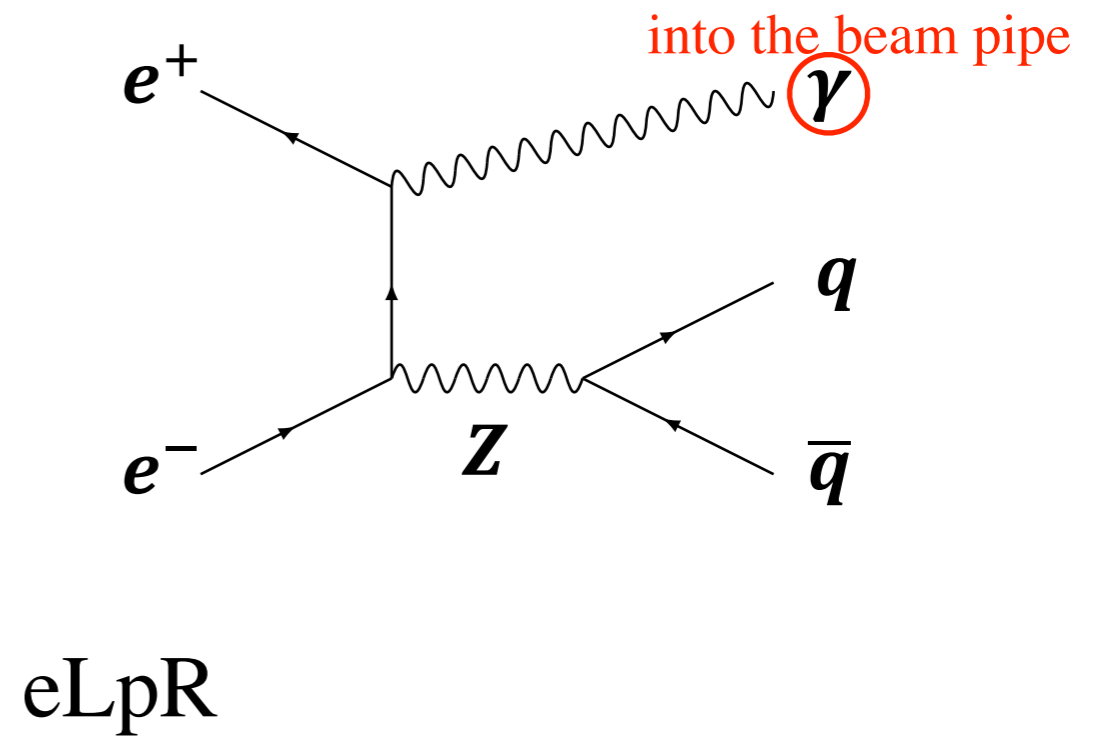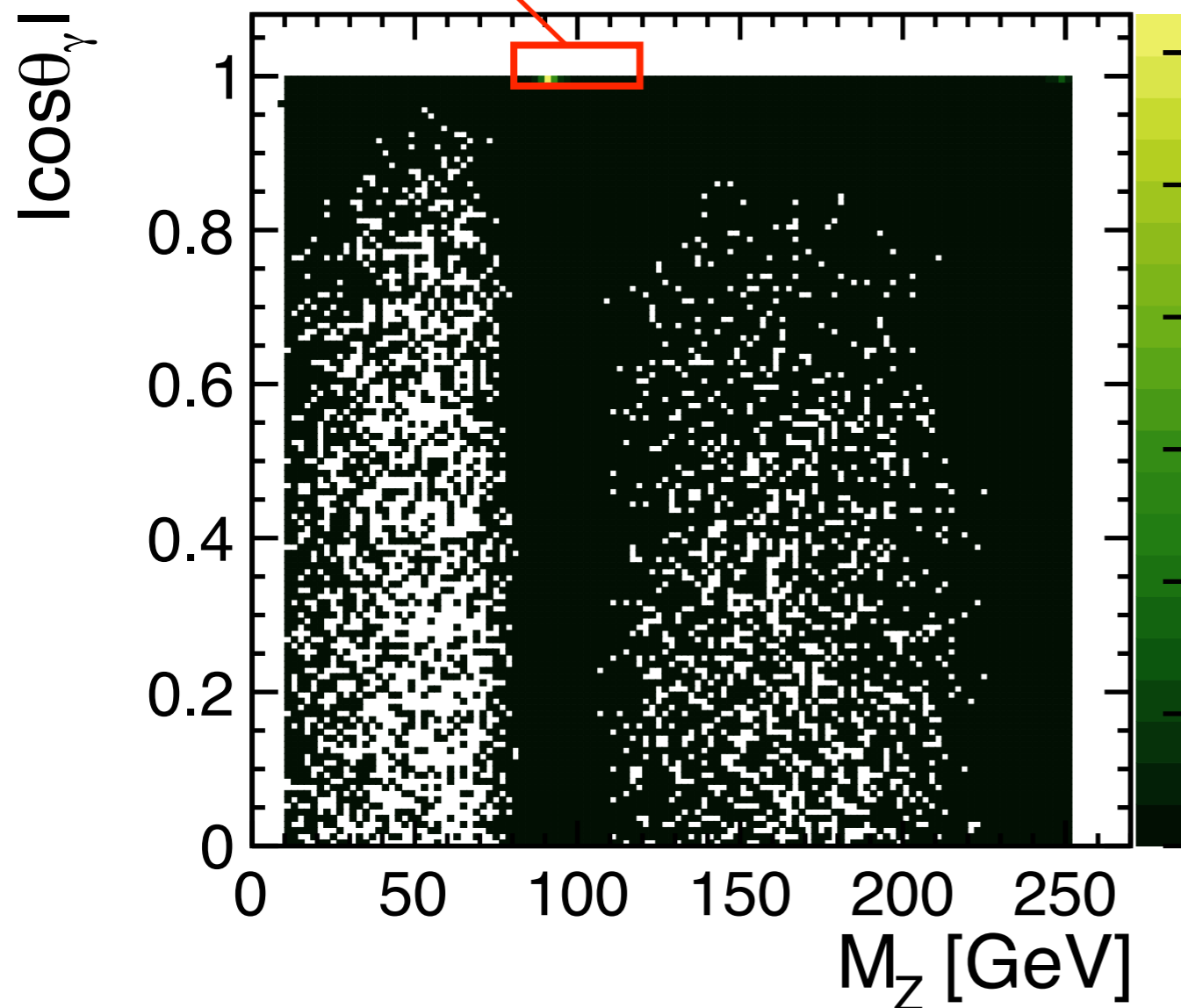
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Signal event definition

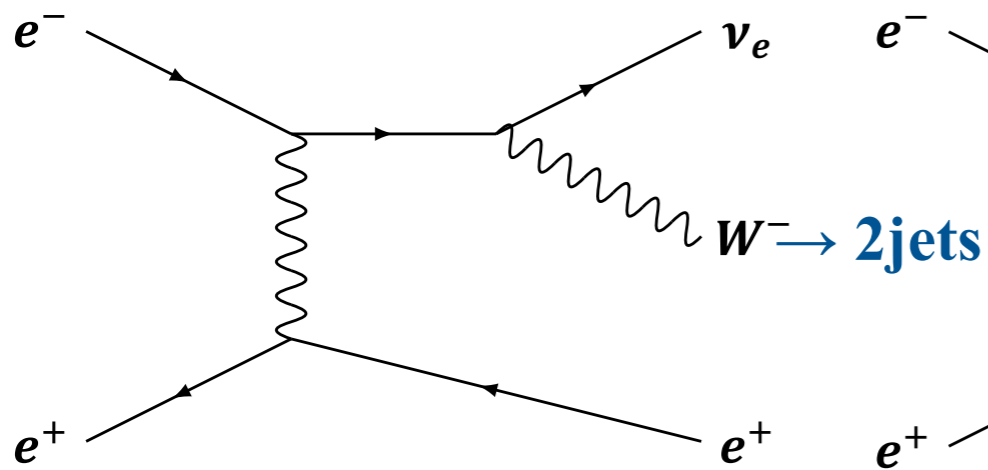Signal event: radiative return with photon escaping into beam pipe

into the beam pipe

e^+ γ

q

e^- Z $\bar{q}$

A. $80 \text{ GeV} < M_{Z(\text{truth})} < 120 \text{ GeV}$

B. $|\cos\theta\gamma_{(\text{truth})}| > 0.999$

eLpR

Major backgrounds
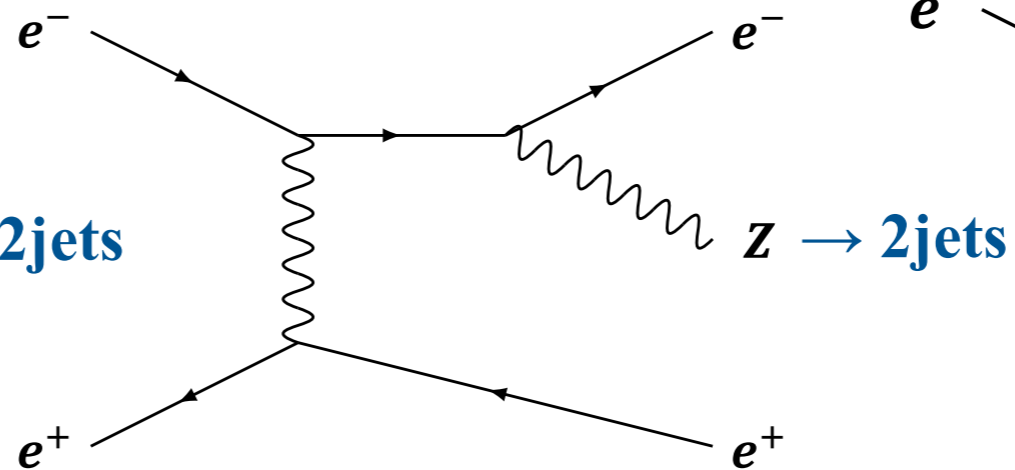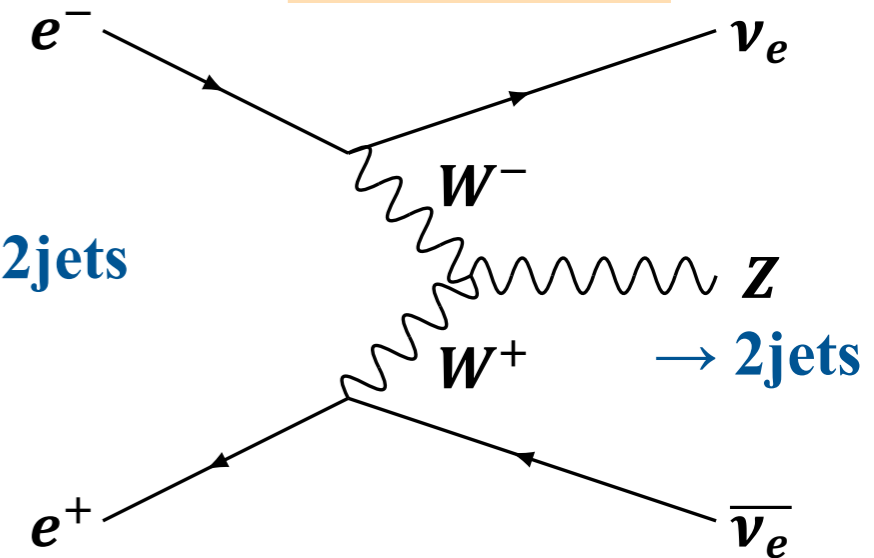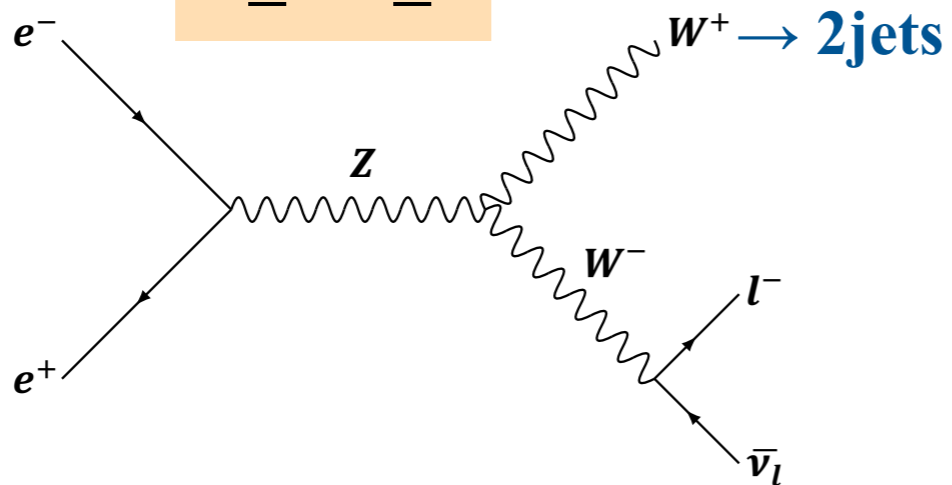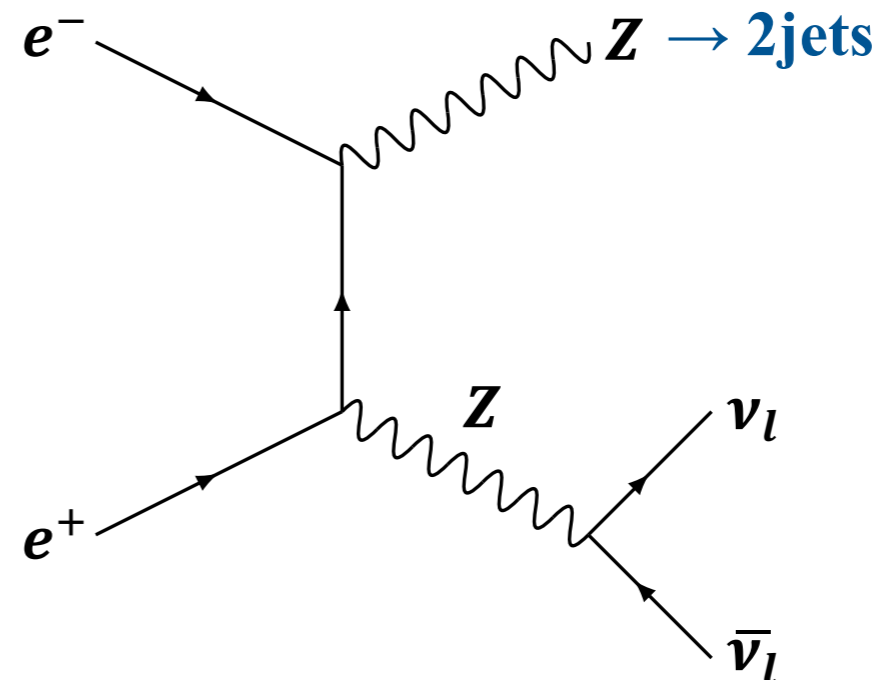
Cut Table

2f_l and all 4f samples are included as background.

2f_h outside the preselection has not been implemented yet.

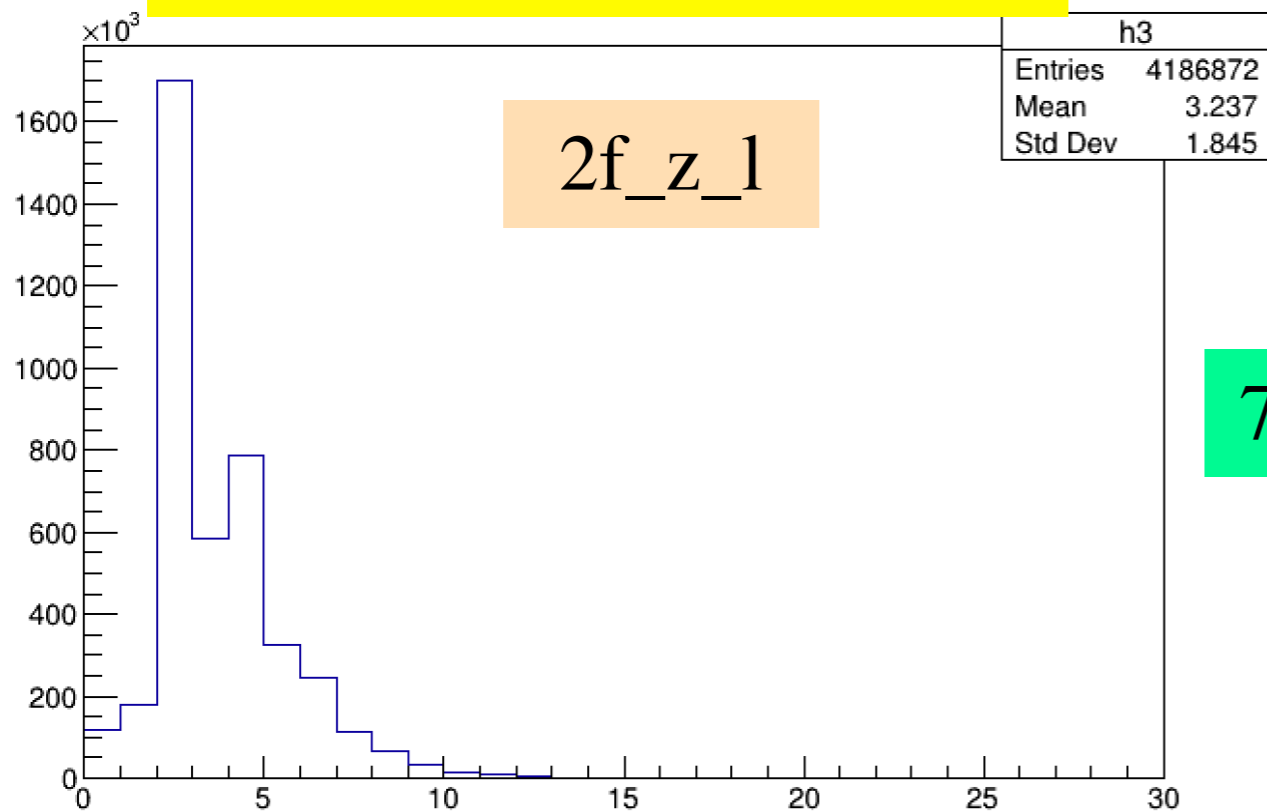Number of events with $(P_{e}-, P_{e}+) = (-0.8, +0.3)$ polarization
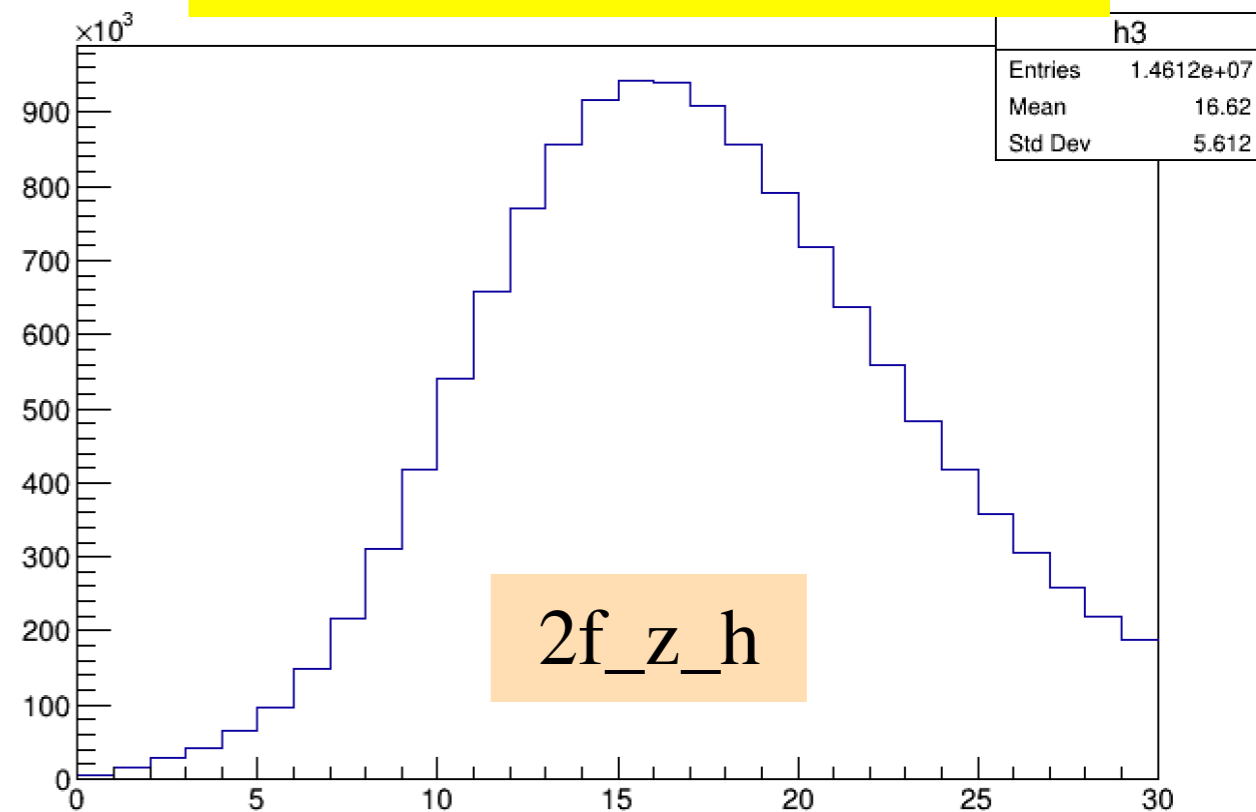
```
Polarization: (e-,e+) = (-0.8,+0.3)
------------------------------------------------------------Reduction Table-------------------------
------
------------------------------------------------------------------------------------------------------
------
                              4f_l        4f_sl      4f_h
Process        :      2f_l                                    4f_h         BG          llh        Signal
------------------------------------------------------------------------------------------------------
------
Cross Section  :     21944    52778.6    37282.4    22797.6      0      59325.8     77324.4     44693.5
------------------------------------------------------------------------------------------------------
------
Generated      :         0          0          0          0      0                        0           0
------------------------------------------------------------------------------------------------------
------
Expected       : 1.97496e+07 4.75008e+07 3.35542e+07 2.05178e+07  0 5.33932e+07 6.9592e+07 4.02242e+07
------------------------------------------------------------------------------------------------------
------
Cut0           : 1.27298e+07 9.34267e+06 1.72468e+07 1.51204e+07  0 5.44396e+07 6.9592e+07 3.25284e+07
------------------------------------------------------------------------------------------------------
------
Cut1           : 1.01022e+07 5.9585e+06 1.59594e+07 1.47615e+07   0 4.67816e+07 5.42706e+07 3.11092e+07
------------------------------------------------------------------------------------------------------
------
Cut2           : 2.55345e+06 1.45781e+06 3.21616e+06   4217.98    0 7.23164e+06 2.56448e+07 2.4446e+07
------------------------------------------------------------------------------------------------------
------
Cut3           : 1.93262e+06   365608     525767     3516.71      0 2.82751e+06 2.55688e+07 2.44239e+07
------------------------------------------------------------------------------------------------------
------
Cut4           : 1.85742e+06   356729     525358     3516.68      0 2.74303e+06 2.54534e+07 2.44238e+07
------------------------------------------------------------------------------------------------------
```

2f_z_l supression

charged in 2 jets

2f_z_l

h3	
Entries	4186872
Mean	3.237
Std Dev	1.845

charged in 2 jets

2f_z_h

h3	
Entries	1.4612e+07
Mean	16.62
Std Dev	5.612

7?

charged + neutral in 2 jets

2f_z_l

h3	
Entries	4186872
Mean	5.229
Std Dev	3.09

charged + neutral in 2 jets

2f_z_h

h3	
Entries	1.4612e+07
Mean	22.47
Std Dev	5.111

10?

Not normalized