# A_LR measurement using e+e- to gamma Z

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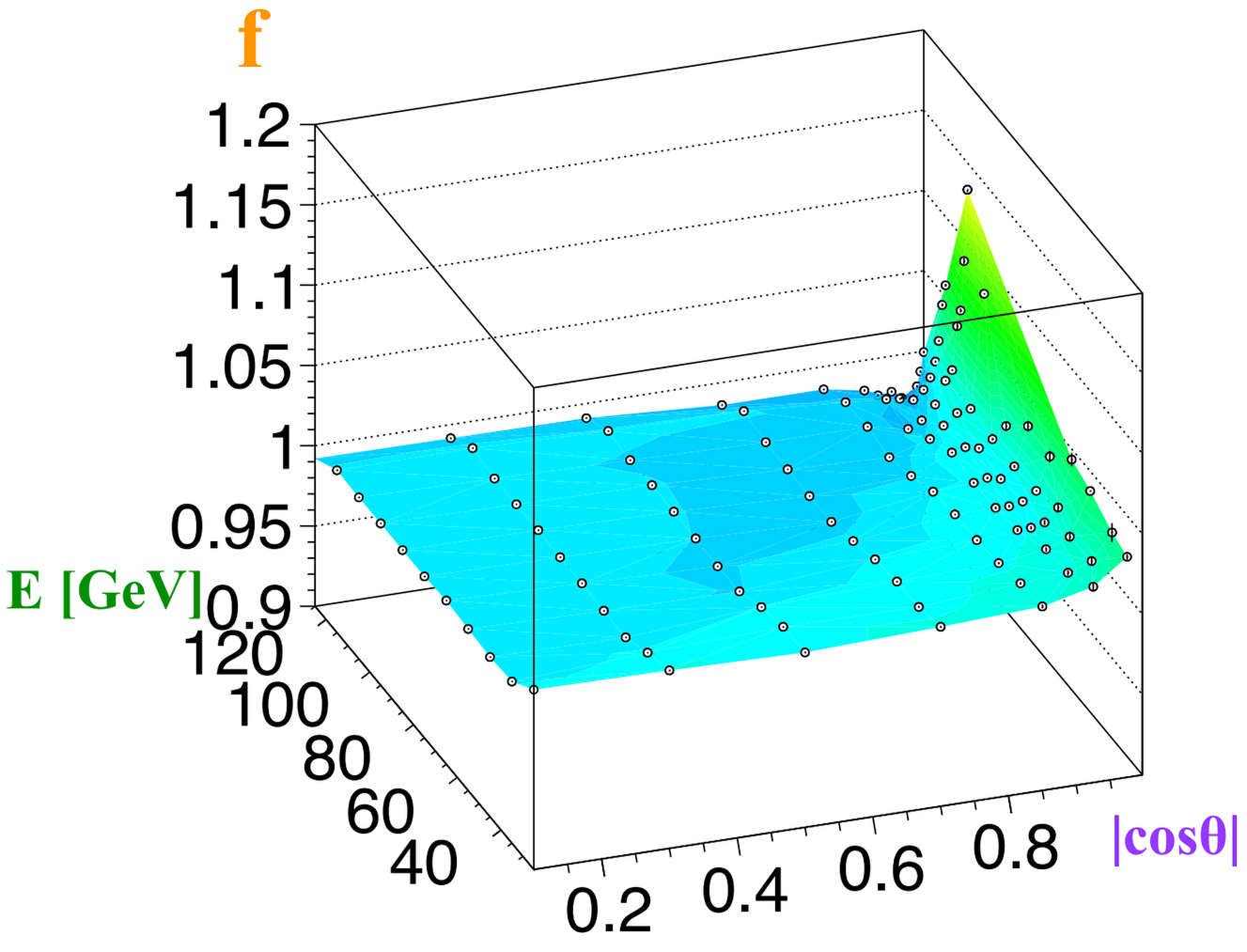
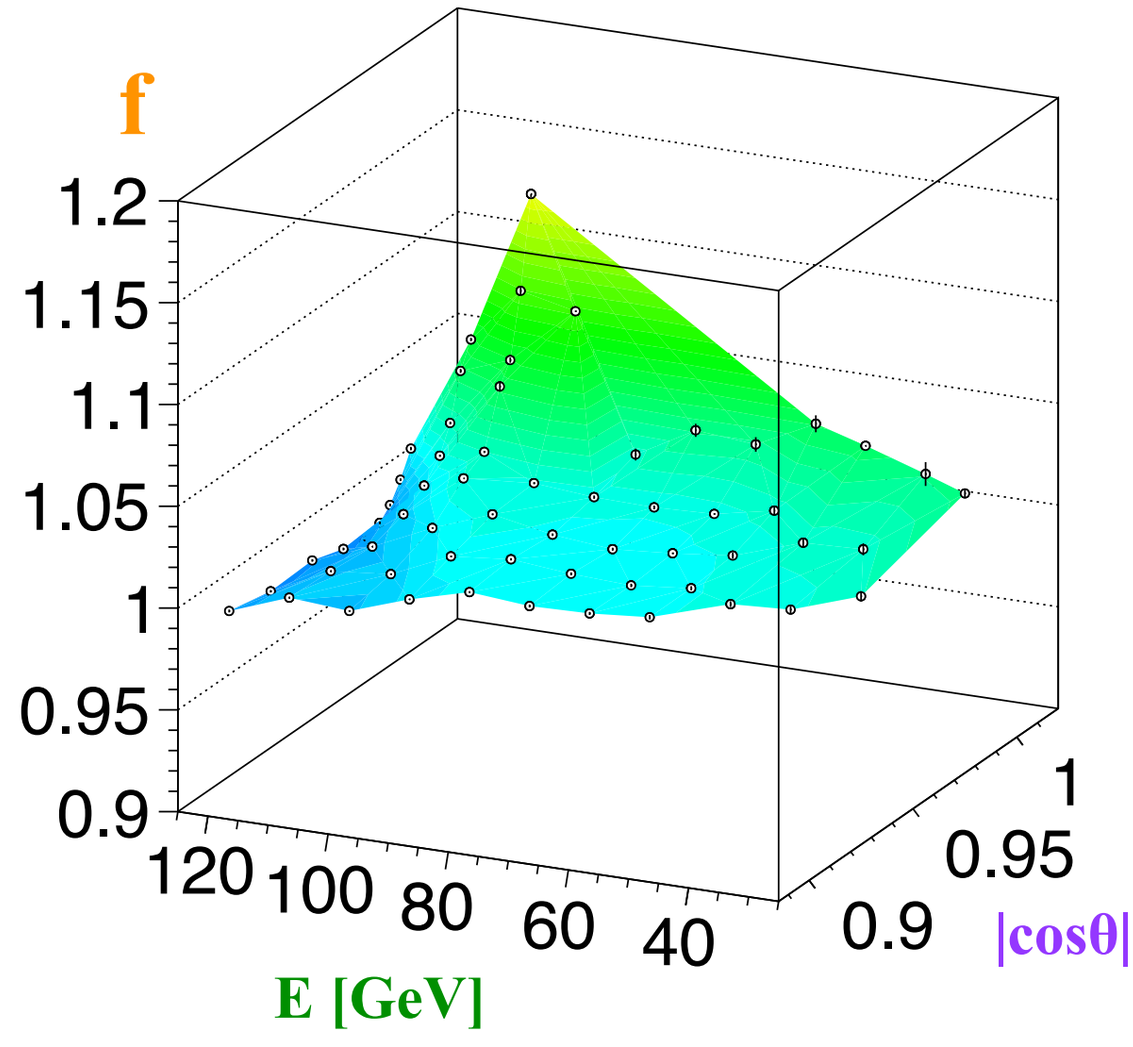
# Determination of calibration factor

**Calibration Factor f:= E_Ang.Method/E_PFO**

**Look at the mean value of Core-Gaussian "μ" for the uds jets as a function of E and |cosθ| and define calibration factor as f:=1/(μ+1)**

**Blowup of high |cosθ| region**



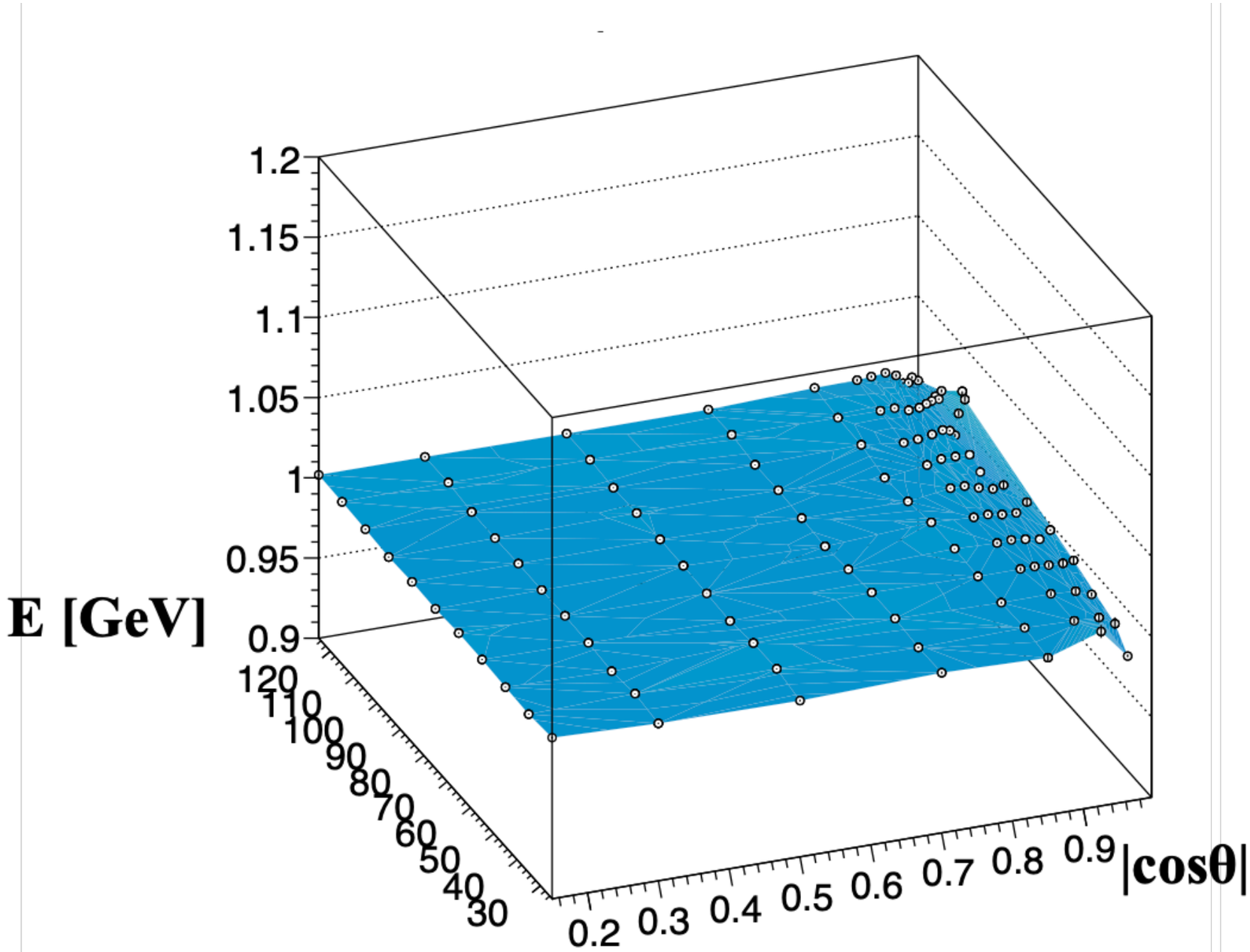



# Determination of calibration factor

**Calibration Factor f:= E_Ang.Method/E_PFO**

**Using this calibration factor, calibration is performed.**

**Distribution of Calibrated E_Ang.Method/E_PFO**



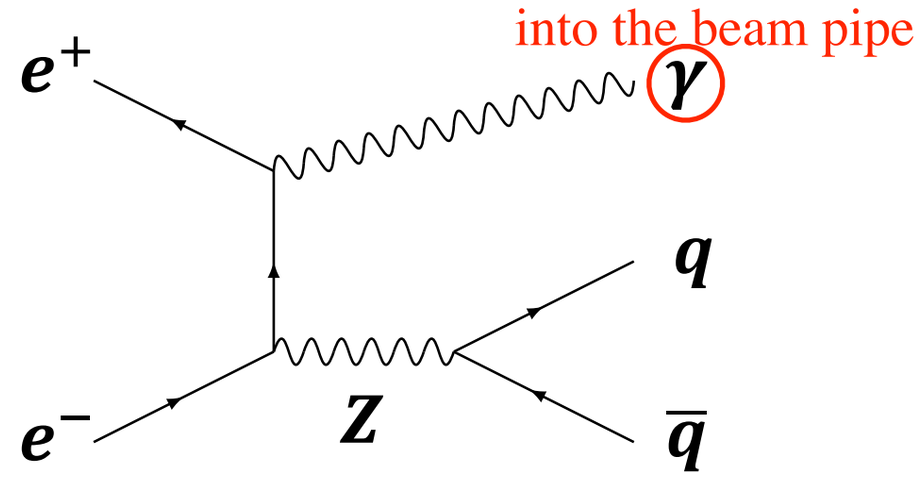
# Signal event definition

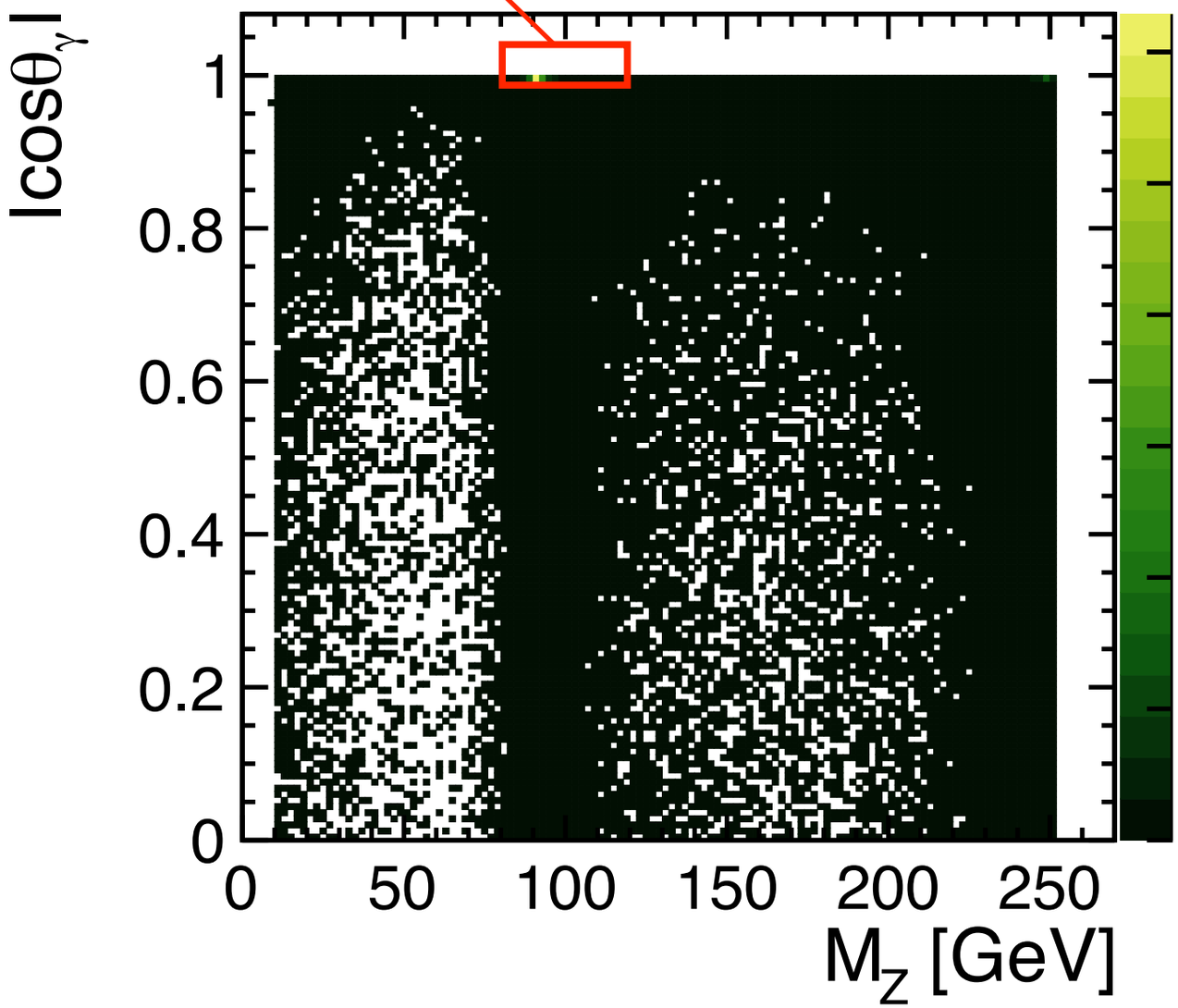


Signal event: radiative return with photon escaping into beam pipe

A. 80 GeV < $Mz_{(truth)}$ < 120 GeV

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

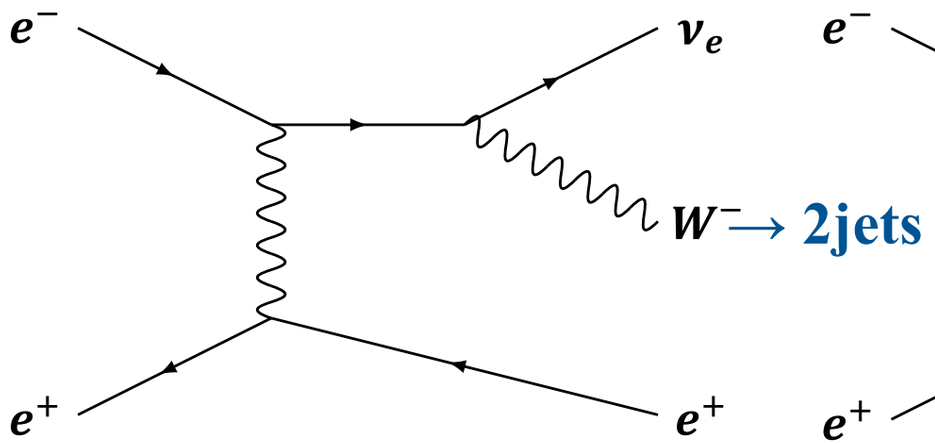


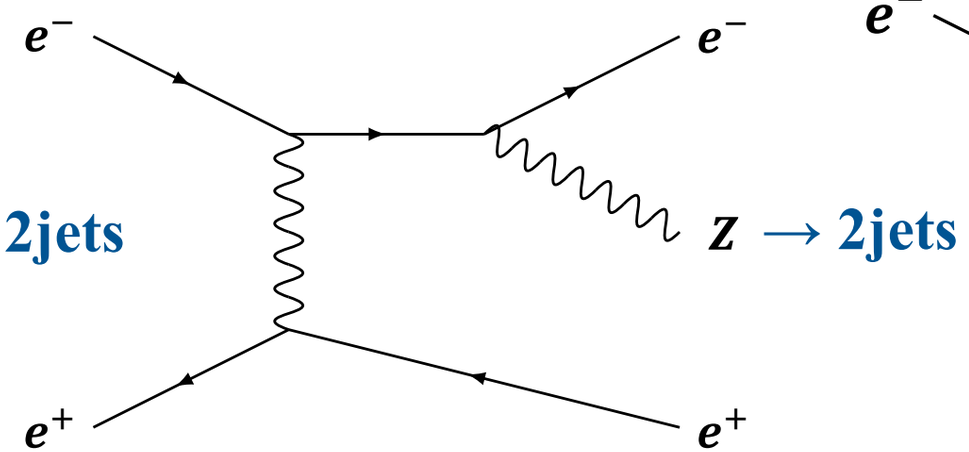

eLpR

# Major backgrounds

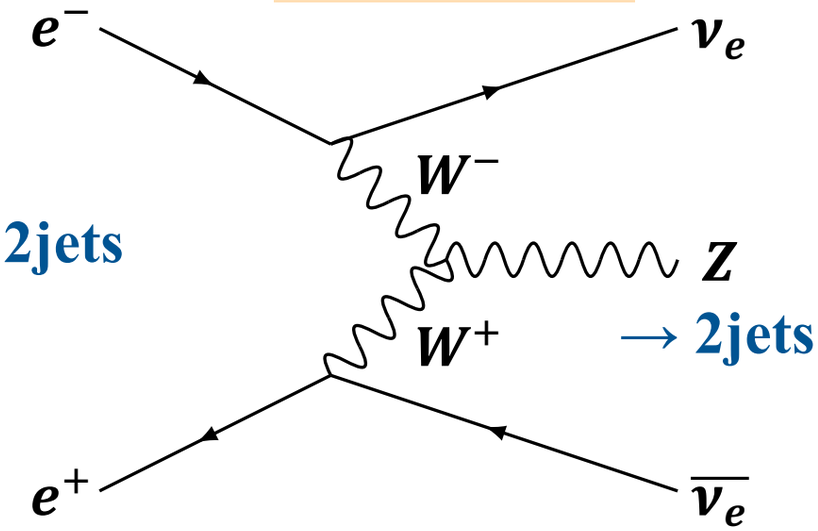
4f_sw_sl



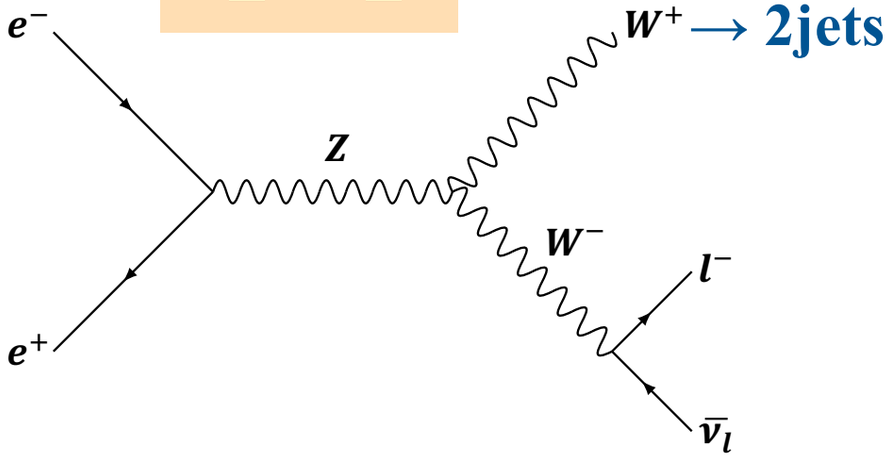

4f_sze_sl



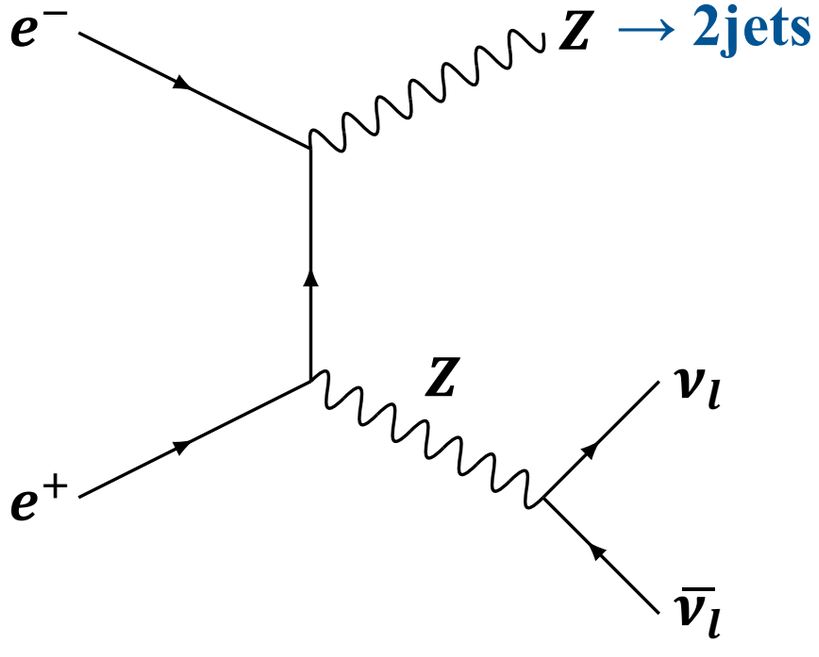

4f_sznu_sl




4f_ww_sl




4f_zz_sl



# Major backgrounds

2f_l, all 4f samples, and 2f_h outside the preselection are included as background.

$$\text{Cut 1} \quad N_{\gamma(E>50\,GeV)} = 0$$
$$\text{Cut 2} \quad 120\,GeV < E_{vis} < 160\,GeV$$
$$\text{Cut 3} \quad |\cos\theta_{2j}| > 0.95$$
$$\text{Cut 4} \quad N_{charged} > 7$$
$$\text{Cut 5} \quad N_{charged+neutral} > 10$$
$$\text{Cut 6} \quad 50\,GeV < M_{2j} < 160\,GeV$$

Ncharged and Ncharged+neutral are counted as sums for now.
They should be counted separately in each jet.

# Cut Table

$(-0.8, +0.3)$ polarization.

| $\times 10^6$ events | Signal | 2f_l | 4f_l | 4f_sl | 4f_h | 2f_h (non-Signal) | Background tot. |
|---|---|---|---|---|---|---|---|
| Expected | 32.5 | 12.7 | 9.34 | 17.2 | 15.1 | 37.1 | 91.5 |
| Cut 1 | 31.1 | 10.1 | 5.96 | 16.0 | 14.8 | 23.2 | 69.9 |
| Cut 2 | 24.4 | 2.55 | 1.46 | 3.22 | 0.00422 | 1.20 | 8.43 |
| Cut 3 | 24.4 | 1.93 | 0.366 | 0.526 | 0.00352 | 1.14 | 3.97 |
| Cut 4 | 23.4 | 0.0430 | 0.00706 | 0.502 | 0.00350 | 0.995 | 1.55 |
| Cut 5 | 23.4 | 0.0294 | 0.00471 | 0.502 | 0.00350 | 0.993 | 1.53 |
| Cut 6 | 23.4 | 0.0292 | 0.00470 | 0.502 | 0.00350 | 0.935 | 1.47 |

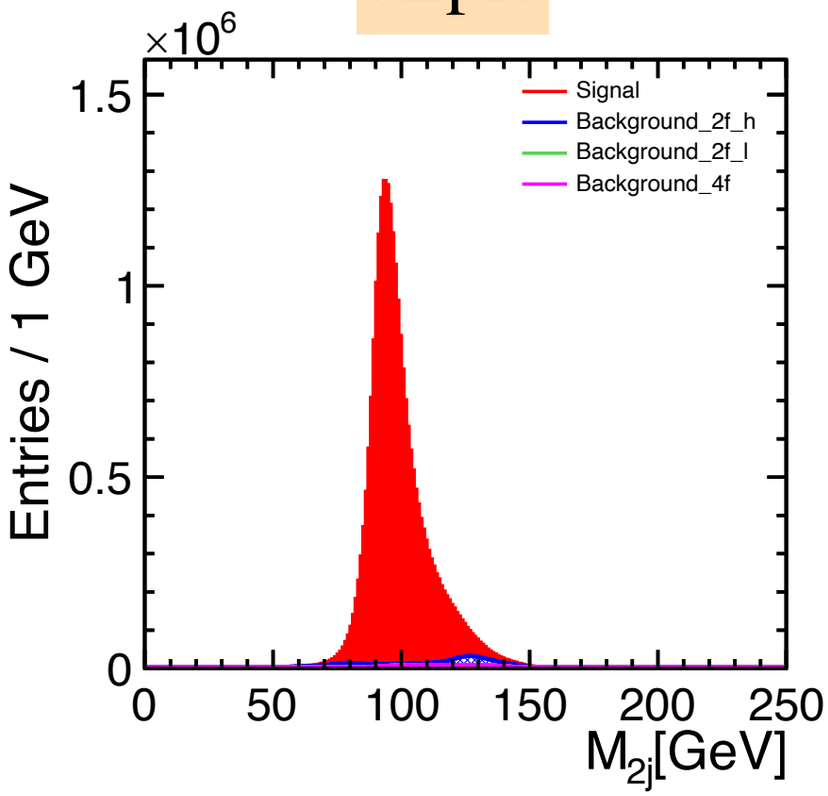
$(+0.8, -0.3)$ polarization.

| $\times 10^6$ events | Signal | 2f_l | 4f_l | 4f_sl | 4f_h | 2f_h (non-Signal) | Background tot. |
|---|---|---|---|---|---|---|---|
| Expected | 21.6 | 9.84 | 5.50 | 2.56 | 1.41 | 19.5 | 38.8 |
| Cut 1 | 20.6 | 7.77 | 2.33 | 1.86 | 1.38 | 10.4 | 23.8 |
| Cut 2 | 16.2 | 1.83 | 0.378 | 0.370 | 0.00137 | 1.12 | 3.70 |
| Cut 3 | 16.2 | 1.37 | 0.259 | 0.106 | 0.00124 | 1.10 | 2.84 |
| Cut 4 | 15.6 | 0.0302 | 0.00394 | 0.0952 | 0.00123 | 0.929 | 1.06 |
| Cut 5 | 15.5 | 0.0207 | 0.00262 | 0.0950 | 0.00123 | 0.927 | 1.05 |
| Cut 6 | 15.5 | 0.0206 | 0.00261 | 0.0948 | 0.00123 | 0.855 | 0.974 |

# Stack plots



eLpR




eRpL