

# Testbeam Analysis

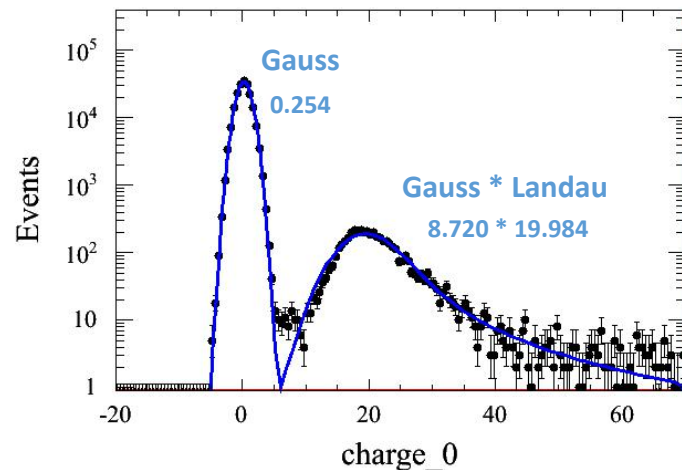
Suyu XIAO from IHEP

2019-01-10

# Fitting

- Fits the appropriate distribution to the property and extracts the corresponding value and uncertainty

Min, Max voltage	Gauss x Landau fit
Start, stop, min , max indices	Gaussian fit
Noise / pedestal	Gaussian or Gaussian x Linear (dynamic)
Min, Max, Rise, Trigger time	Gaussian fit
Charge, dV/dT, Jitter, FFT	Gauss x Landau fit



```
COVARIANCE MATRIX CALCULATED SUCCESSFULLY
FCN=348568 FROM HESSE STATUS=OK 60 CALLS 2351 TOTAL
EDM=0.000119896 STRATEGY= 1 ERROR MATRIX ACCURATE

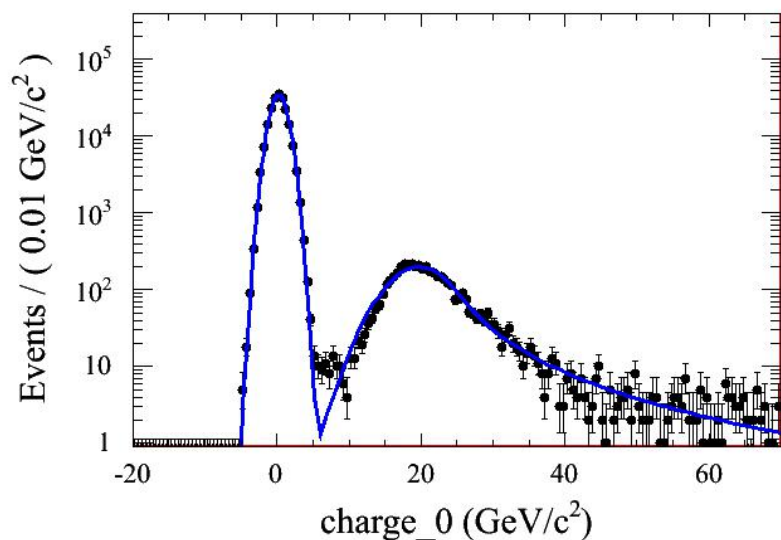
EXT PARAMETER          INTERNAL          INTERNAL
NO.  NAME              VALUE          ERROR      STEP SIZE      VALUE
1  mean_gs             2.53849e-01   2.57773e-03  3.54510e-03   -1.54452e-01
2  mean_gs_conv        8.71953e+00   9.74020e-02  3.41848e-03   -7.78817e-01
3  mean_l              1.99844e+01   9.85133e-02  4.93035e-02   1.51484e+00
4  siglfrac            9.76305e-01   3.37174e-04  1.08574e-03   1.20072e+00
5  sigma_gs            1.14939e+00   1.82768e-03  8.16694e-04   -6.55084e-01
6  sigma_gs_conv       3.66726e+00   8.64567e-02  6.45809e-03   -3.70284e-01
7  sigma_l             1.06678e+00   4.98446e-02  7.80008e-03   -6.10513e-01
ERR DEF= 0.5
```

Which value should we use to calculate the charge as function of high voltage?

# Thanks!

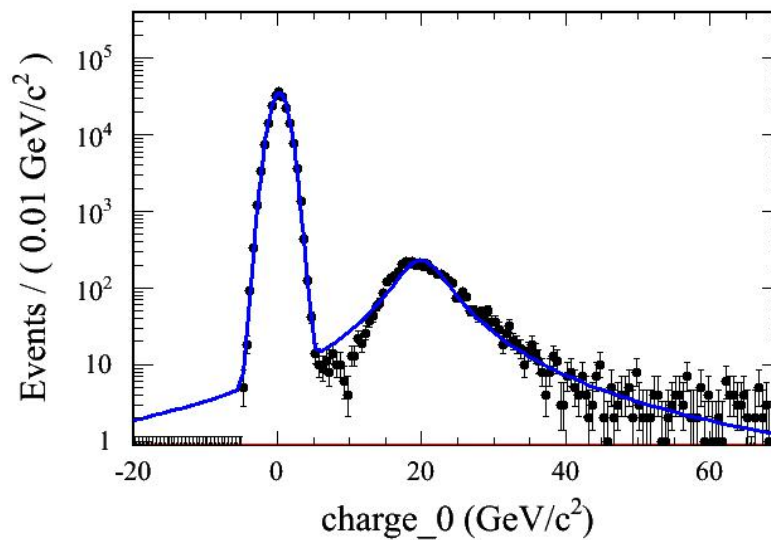
# Back-up

## CBShape



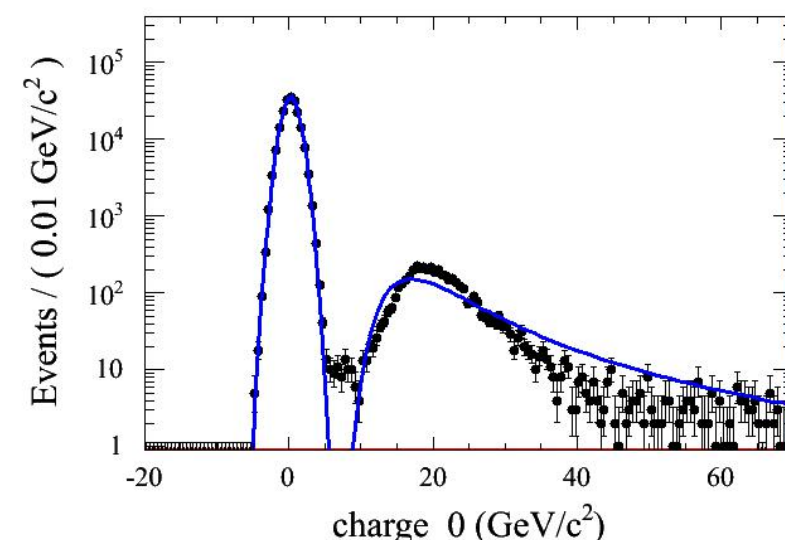
```
COVARIANCE MATRIX CALCULATED SUCCESSFULLY
FCN=348551 FROM HESSE STATUS=OK 50 CALLS 260 TOTAL
EDM=8.60021e-05 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER INTERNAL INTERNAL
NO. NAME VALUE ERROR STEP SIZE VALUE
1 alpha -1.26275e+00 6.85245e-02 2.11135e-04 3.77531e-01
2 mean 1.97457e+01 9.64430e-02 9.43689e-04 1.92842e-01
3 mean_gs 2.53801e-01 2.57768e-03 1.41796e-04 -1.54613e-01
4 n 2.09265e+00 2.18349e-01 5.85159e-04 -1.63668e-01
5 siglfrac 9.76292e-01 3.37314e-04 8.50710e-05 8.67825e-01
6 sigma 4.29451e+00 8.14769e-02 3.36999e-04 -7.42825e-01
7 sigma_gs 1.14928e+00 1.82790e-03 3.26708e-05 -6.55206e-01
ERR DEF= 0.5
```

## BreitWigner



```
COVARIANCE MATRIX CALCULATED SUCCESSFULLY
FCN=348652 FROM HESSE STATUS=OK 31 CALLS 204 TOTAL
EDM=1.44936e-05 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER INTERNAL INTERNAL
NO. NAME VALUE ERROR STEP SIZE VALUE
1 mean 1.98990e+01 7.33686e-02 1.69577e-04 -3.54157e-01
2 mean_gs 2.52770e-01 2.57651e-03 1.41847e-04 -1.58090e-01
3 siglfrac 9.75427e-01 3.48989e-04 8.65848e-05 8.54545e-01
4 sigma 7.17712e+00 1.46701e-01 3.49328e-04 5.49358e-01
5 sigma_gs 1.14602e+00 1.83760e-03 3.29430e-05 -6.58787e-01
ERR DEF= 0.5
```

## Landau



```
COVARIANCE MATRIX CALCULATED SUCCESSFULLY
FCN=349183 FROM HESSE STATUS=OK 31 CALLS 131 TOTAL
EDM=9.2767e-05 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER INTERNAL INTERNAL
NO. NAME VALUE ERROR STEP SIZE VALUE
1 mean 1.77184e+01 9.01315e-02 1.99197e-04 -1.20544e-01
2 mean_gs 2.54637e-01 2.58193e-03 7.10448e-04 -1.51791e-01
3 siglfrac 9.76436e-01 3.36178e-04 8.50501e-05 8.70042e-01
4 sigma 3.05856e+00 4.58003e-02 8.13764e-05 7.31958e-03
5 sigma_gs 1.15135e+00 1.83385e-03 1.63495e-04 -6.52935e-01
ERR DEF= 0.5
```