Reminder

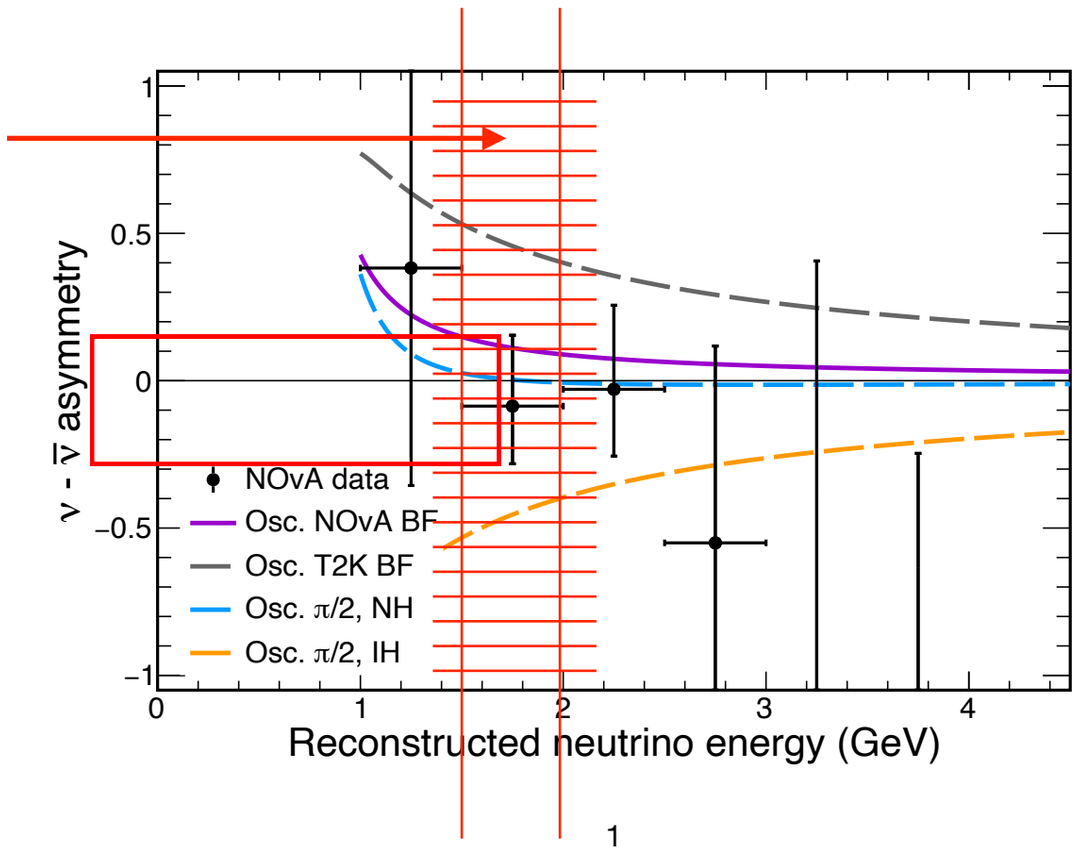
True frequentist way would be in generating pseudo experiments for all Asymmetry values in [-1, 1] and then find confidence interval.

根据Jon老师上次发的邮件来读！！！

Notes on this procedure:

- ✳ There are a lot of degeneracies in osc. parameters that will represent the same Asymmetry.
- ✳ Will need to make thousands of experiments in each bin of Acp - RecoE surface. And only then find the error bar based on Acp true values which distributions are cut off by data point corresponding to 68% CL. That is similar to FC we're doing for different slices and contours.
- ✳ Took 1.5 - 2 GeV bin and generated experiments in some Acp points.

Need to generate experiments in each bin, define significance for each bin and then find confidence interval

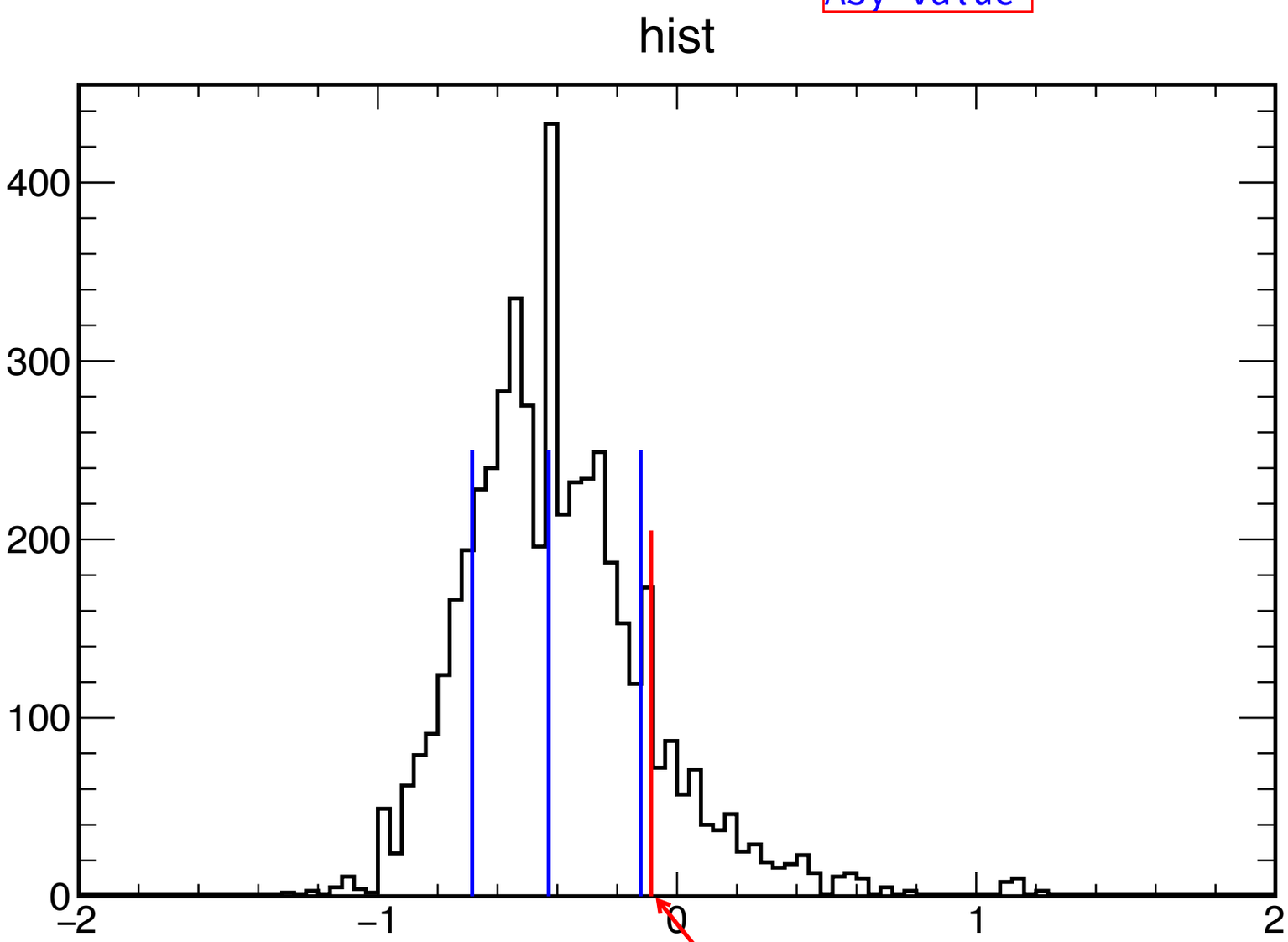


The real data Acp is -0.0809091, just the statistical range for 68% I got from mock experiments in Bayesian way is [-0.28212110; 0.15234090].

Acp = -0.5

Real data cv = -0.0862993

Real data
Median, 16% and 84%



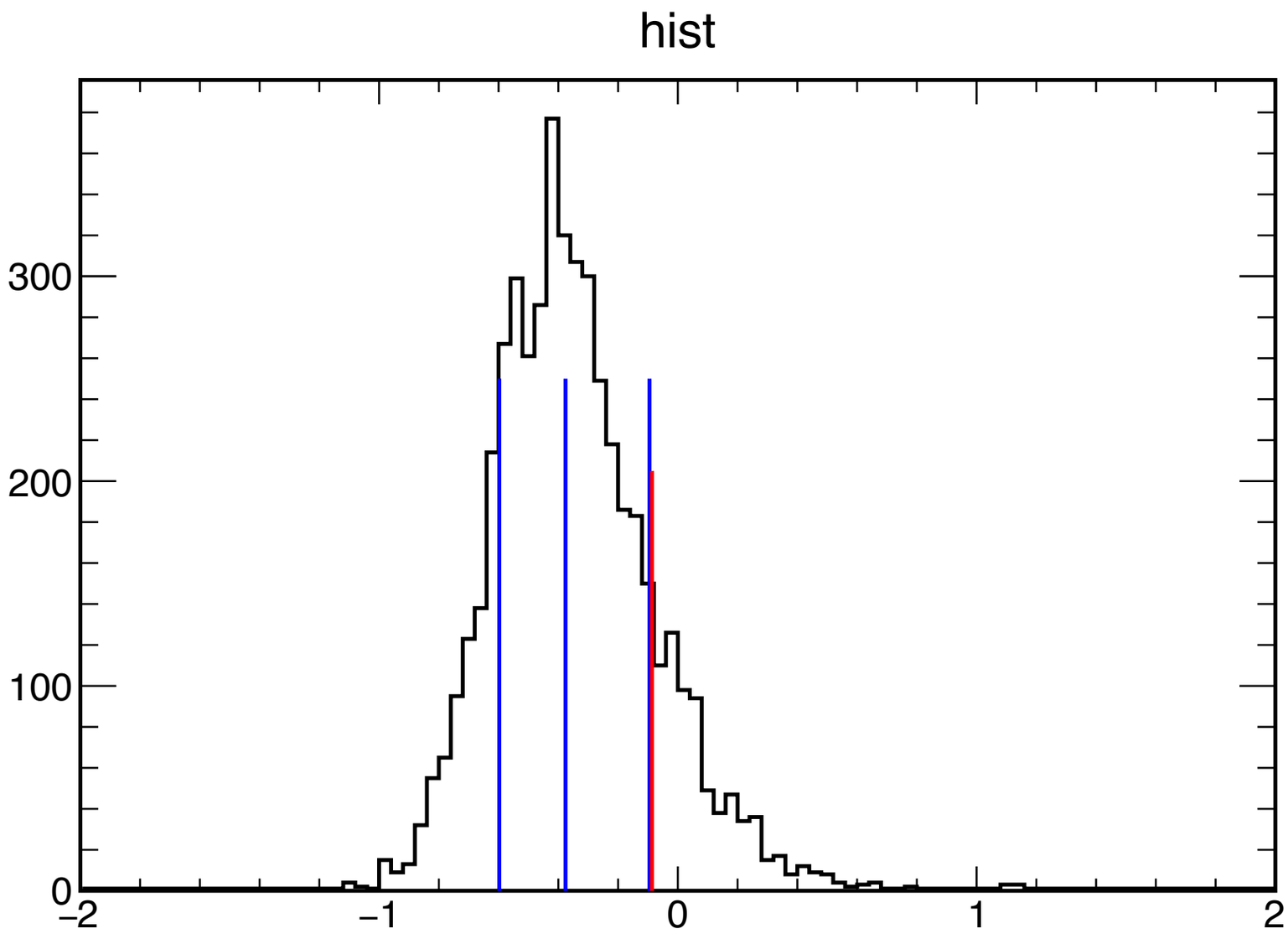
median -0.429099; q16 -0.684734; q84 -0.121694
count quantile at data: 0.875651

Median != initial true Acp value

Acp = -0.45

Real data cv = -0.0862993

Real data
Median, 16% and 84%



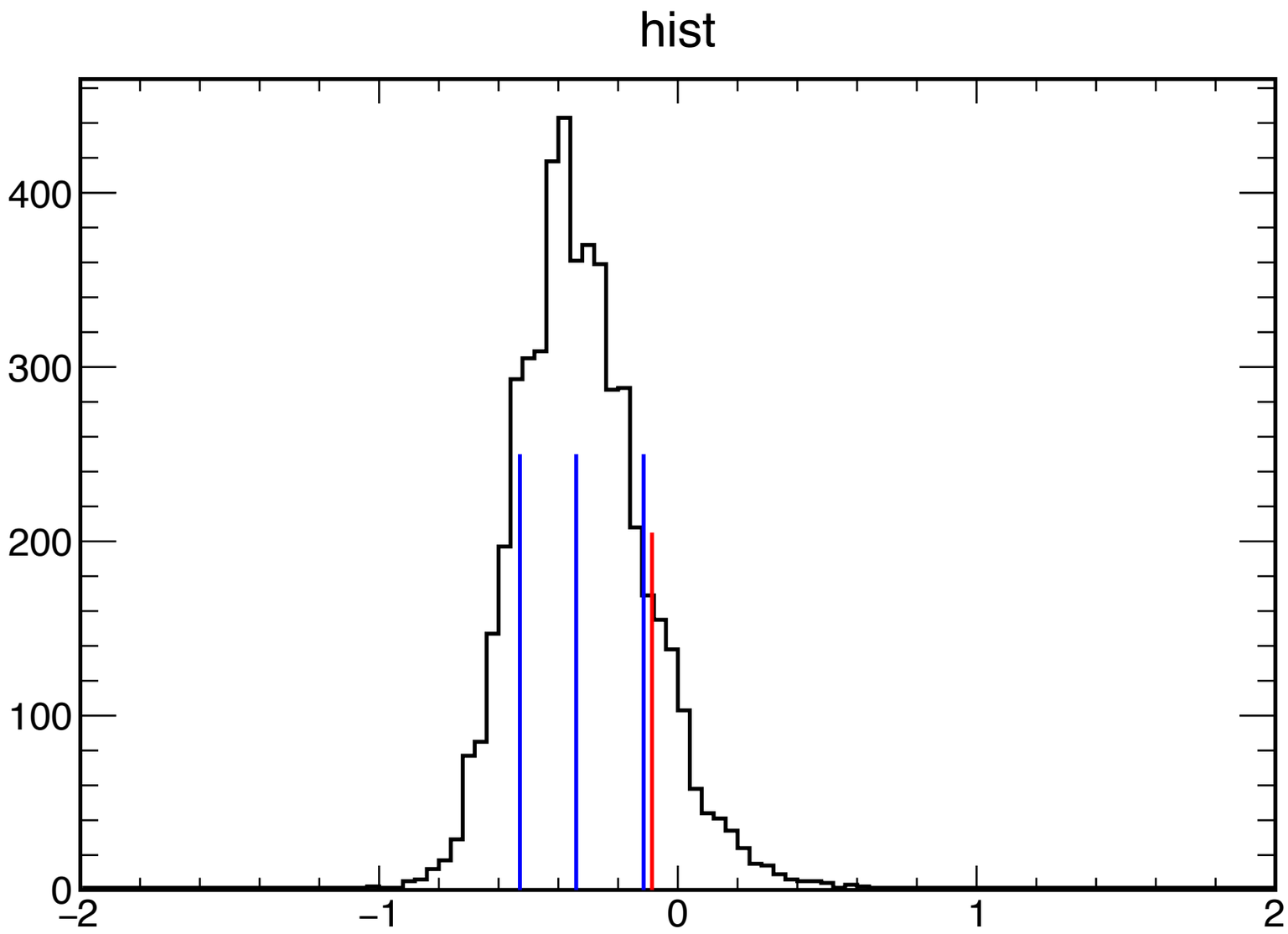
median -0.376062; q16 -0.597627; q84 -0.0948907
count quantile at data: 0.851398

Median != initial true Acp value

Acp = -0.4

Real data cv = -0.0862993

Real data
Median, 16% and 84%



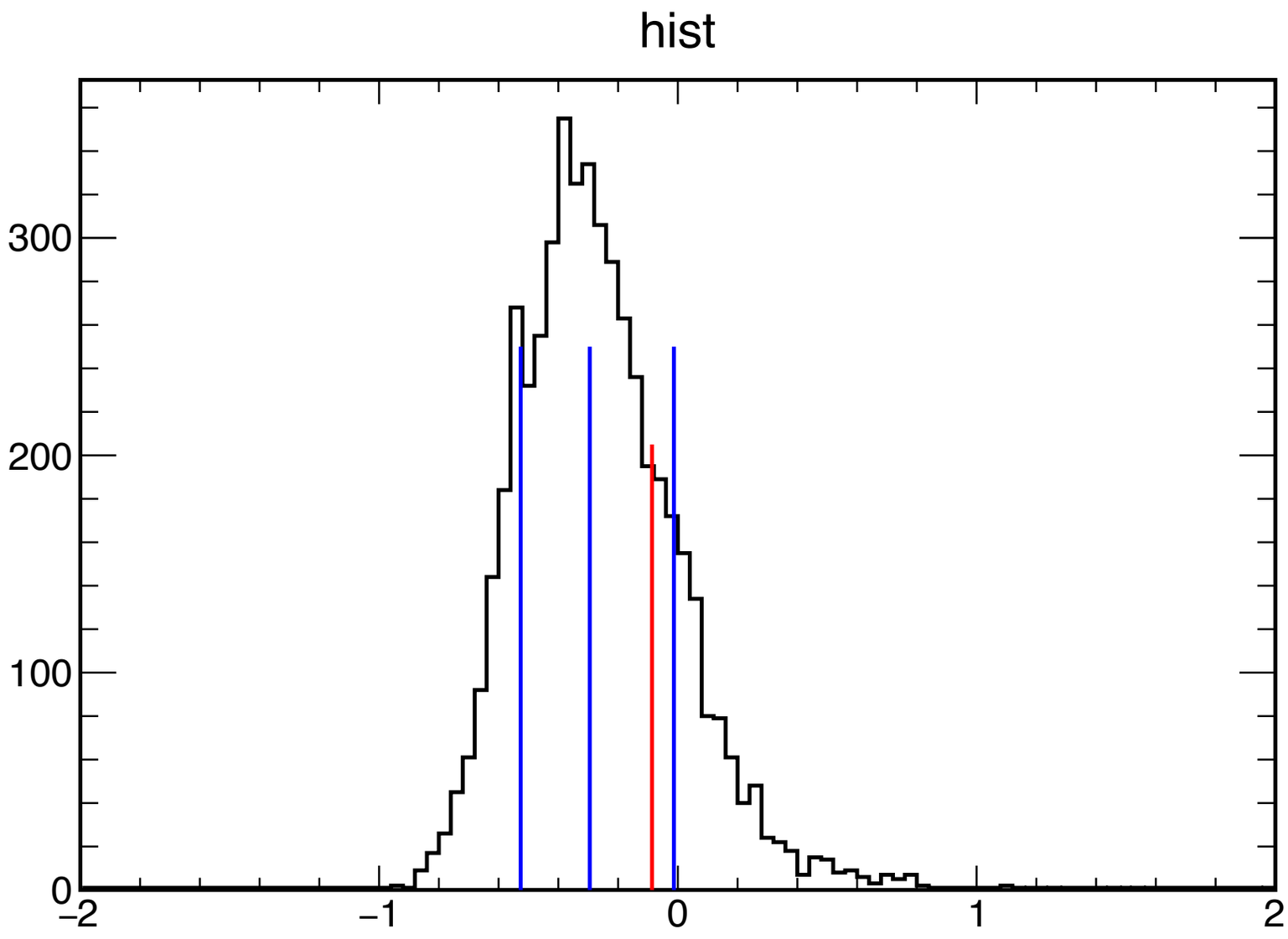
median -0.340166; q16 -0.528601; q84 -0.114556
count quantile at data: 0.868911

Median != initial true Acp value

Acp = -0.35

Real data cv = -0.0862993

Real data
Median, 16% and 84%



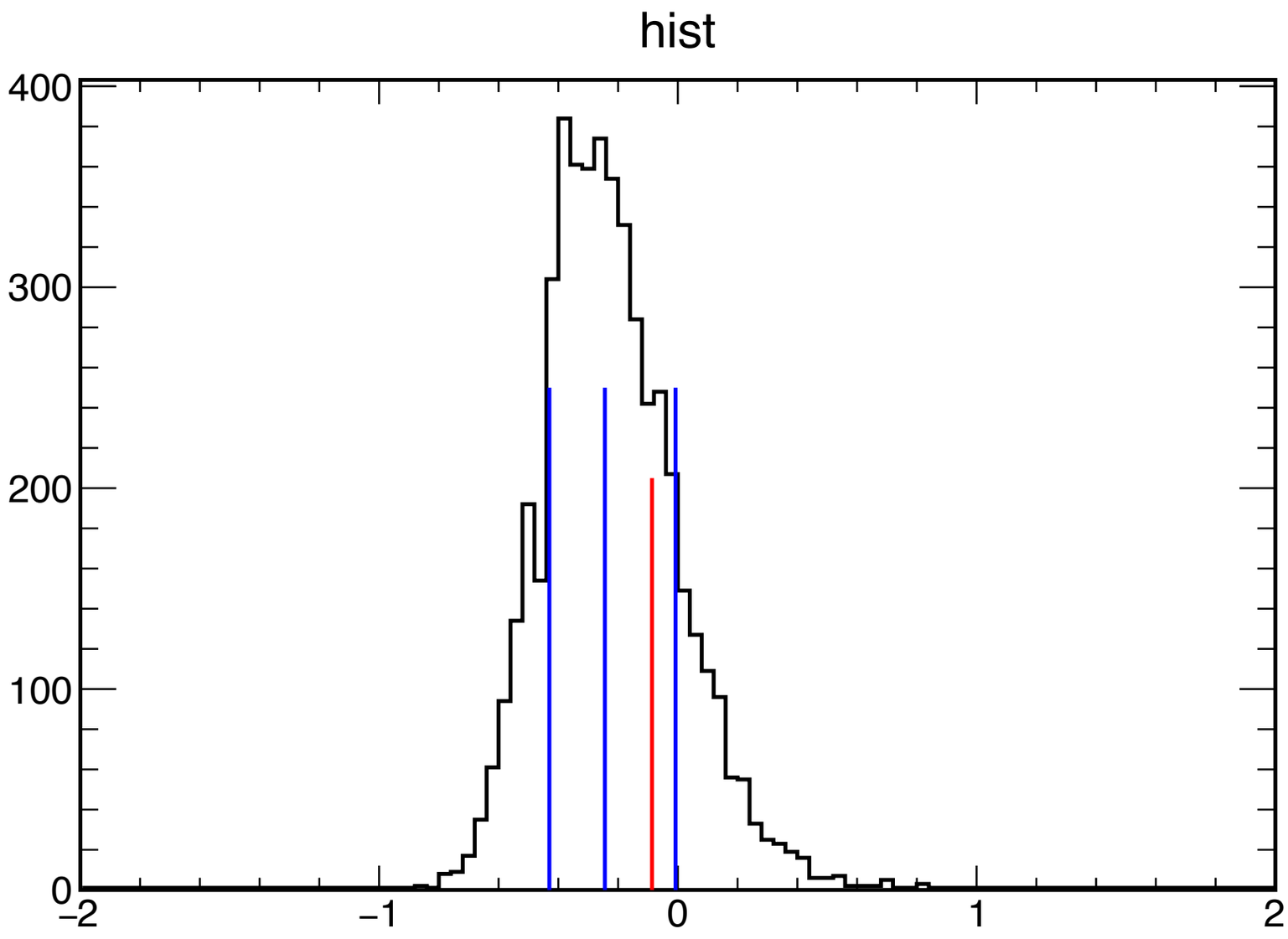
median -0.29479; q16 -0.526143; q84 -0.0132186
count quantile at data: 0.779758

Median != initial true Acp value

Acp = -0.3

Real data cv = -0.0862993

Real data
Median, 16% and 84%



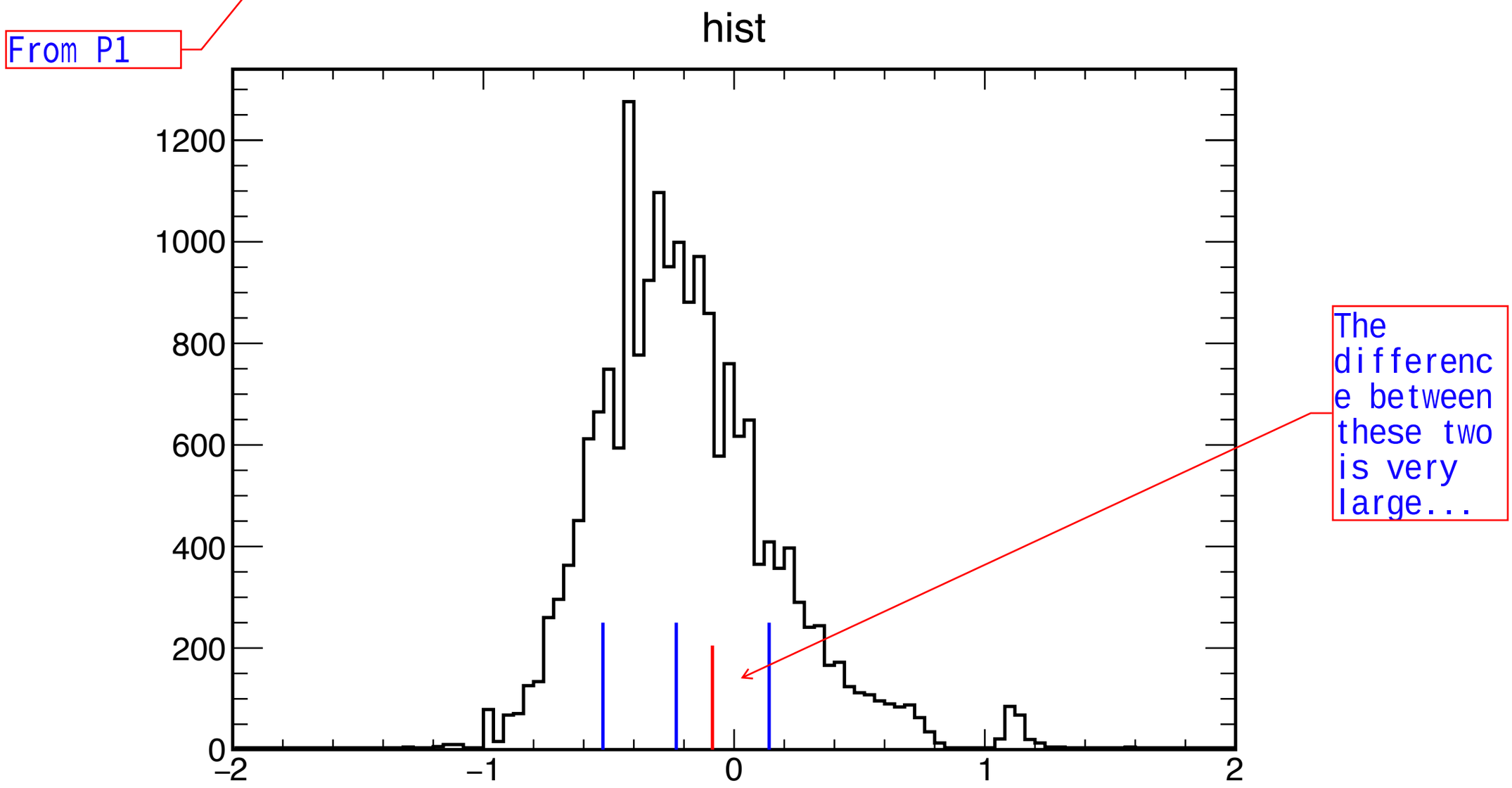
median -0.244278; q16 -0.43; q84 -0.00772947
count quantile at data: 0.755306

Median != initial true Acp value

Acp = -0.282208 (left err)

Real data cv = -0.0862993

Real data
Median, 16% and 84%



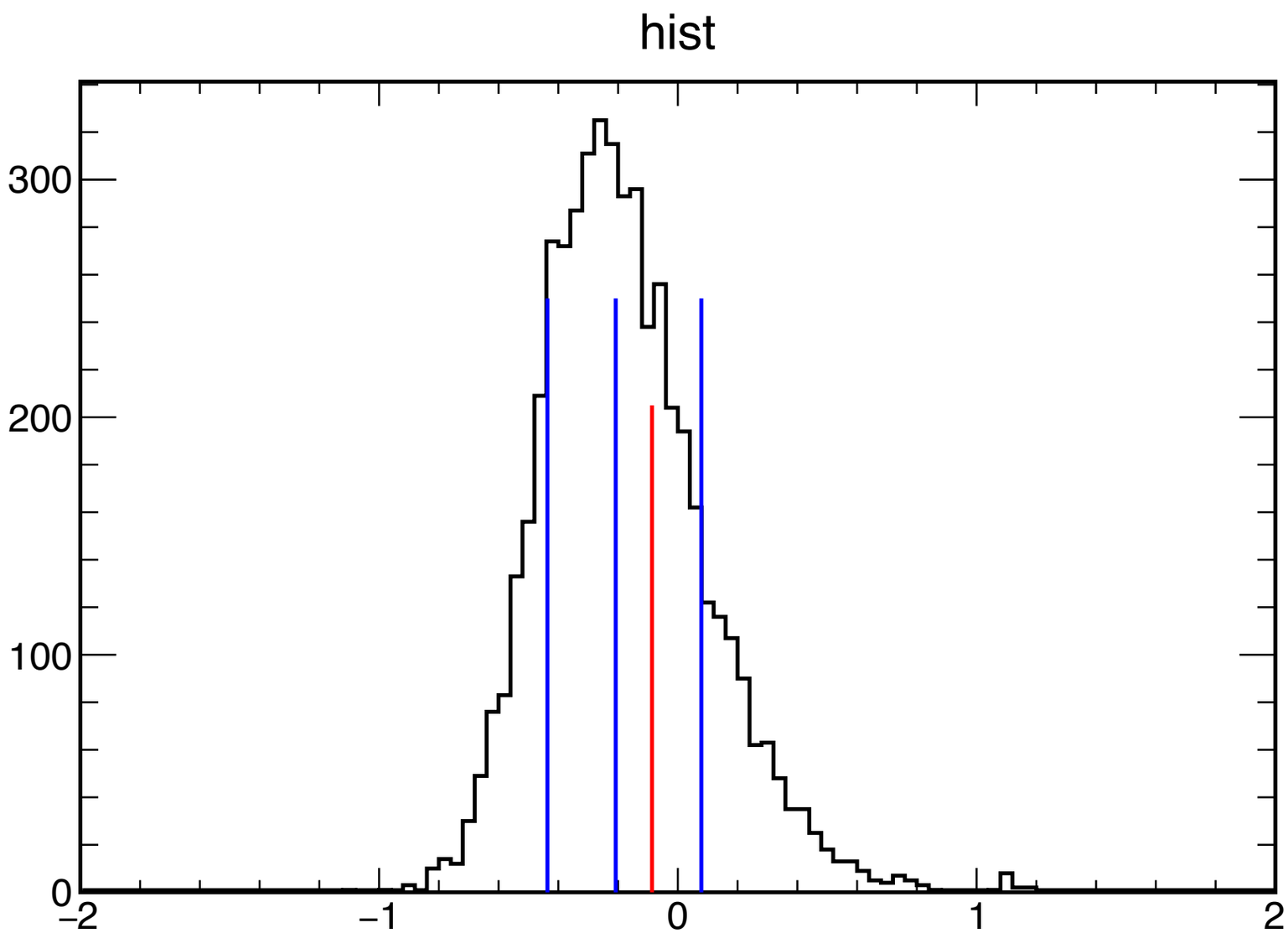
median -0.230811 q16 -0.523162 q84 0.139615
count quantile at data: 0.677949

Median != initial true Acp value

Acp = -0.25

Real data cv = -0.0862993

Real data
Median, 16% and 84%



median -0.207873; q16 -0.436689; q84 0.0785975
count quantile at data: 0.677871

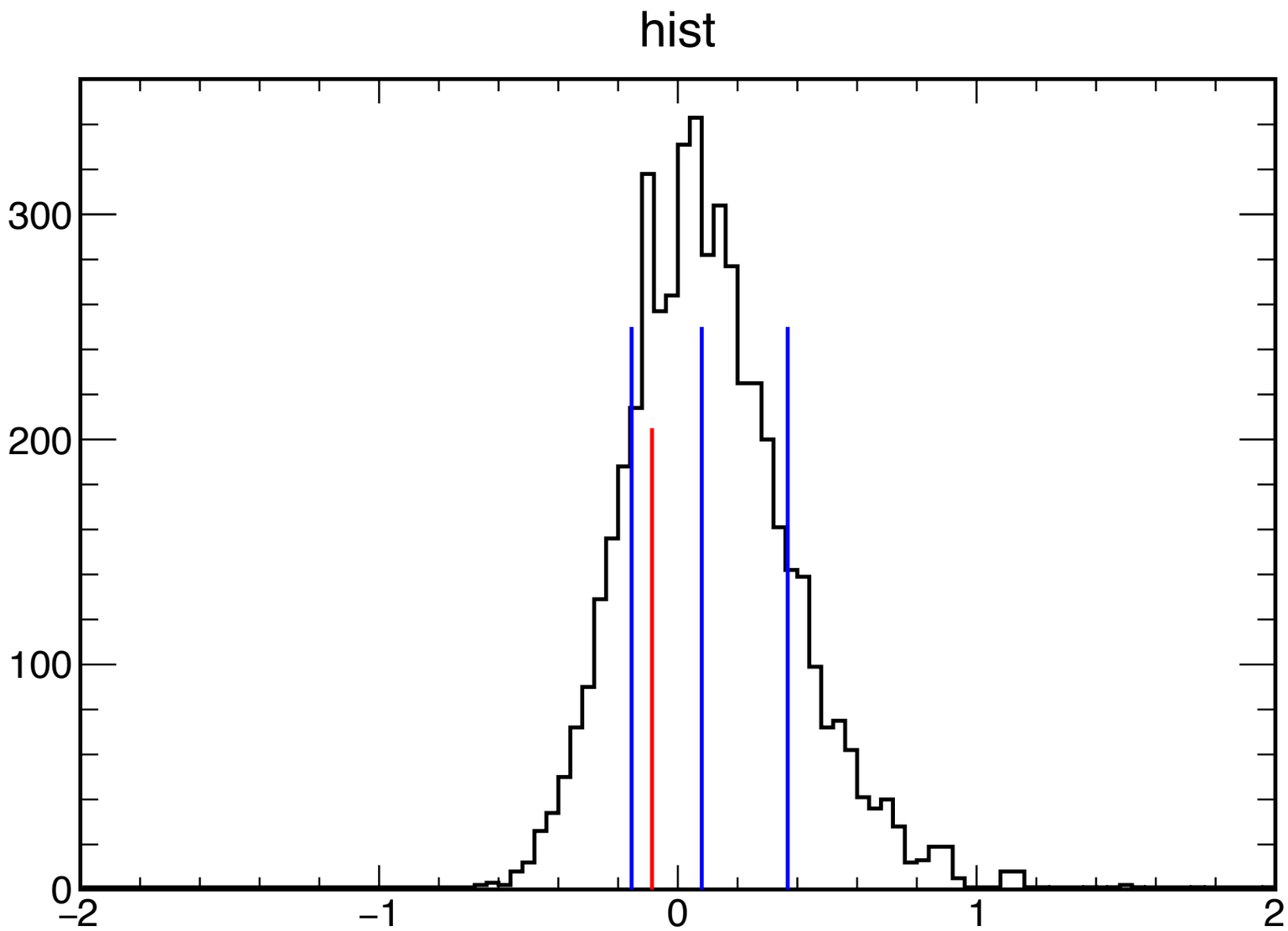
Median != initial true Acp value

Right side of error bar

Acp = 0.1

Real data cv = -0.0862993

Real data
Median, 16% and 84%



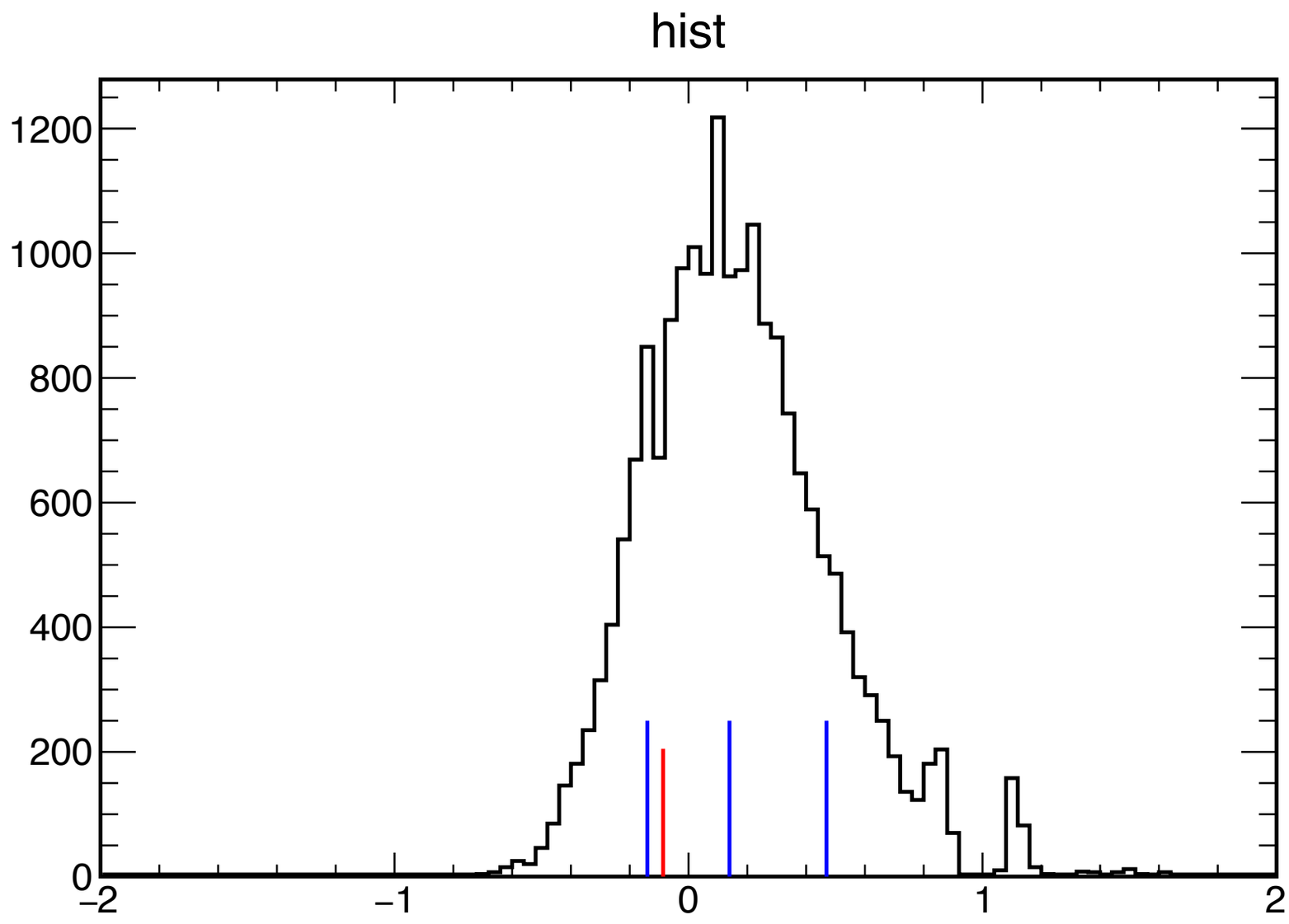
median 0.0801418; q16 -0.154766; q84 0.367606
count quantile at data: 0.2608

Median != initial true Acp value

Acp = 0.152306 (right err)

Real data cv = -0.0862993

Real data
Median, 16% and 84%



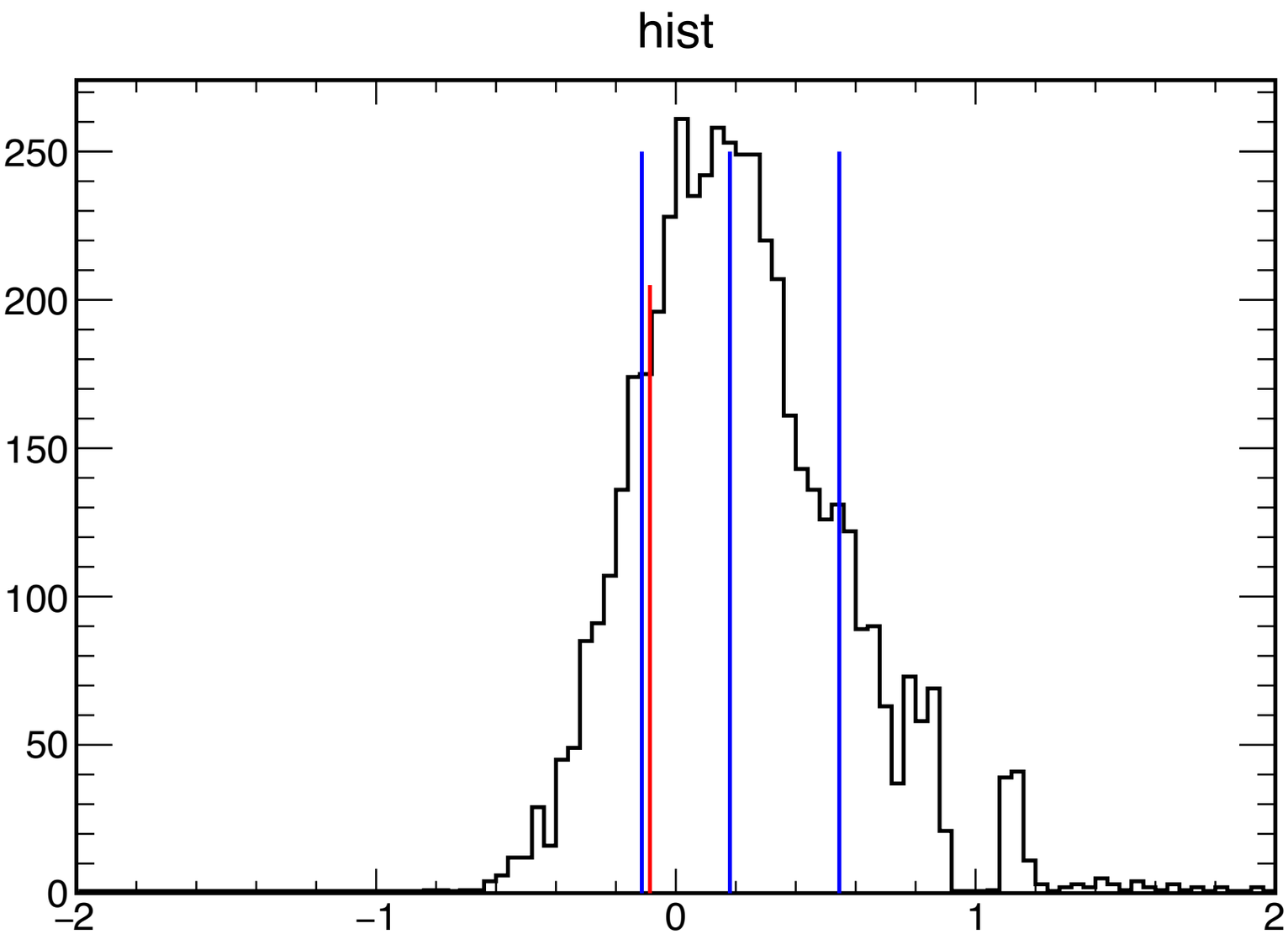
median 0.139273; q16 -0.140107; q84 0.469438
count quantile at data: 0.216396

Median != initial true Acp value

Acp = 0.2

Real data cv = -0.0862993

Real data
Median, 16% and 84%



median 0.180553; q16 -0.113509; q84 0.545221
count quantile at data: 0.189379

Median != initial true Acp value

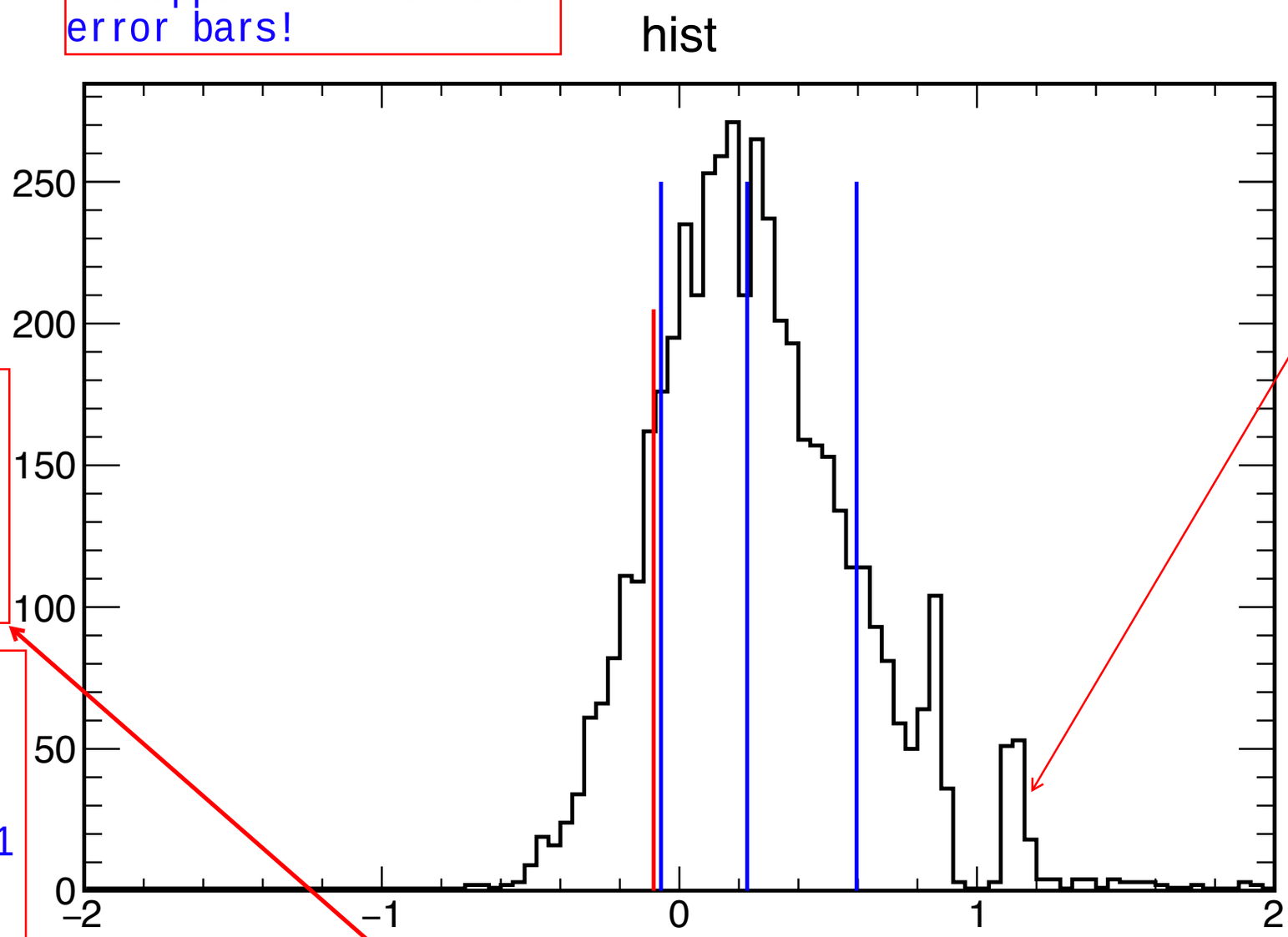
Acp = 0.25

0.25 is even lager than the upper limit of the error bars!

Real data cv = -0.0862993

Real data

Median, 16% and 84%



Larger than 1 due to background fluctuation and subtraction

The first conclusion is: Acp we use (0.25) is not equal to the median of the simulation.

2. The left blue line is close to the red line. We can still assume that it is in the 1 sigma region for the simulation. From above pages we find that the larger Acp we choose, the more lfet the real data will located compared to the distribution.

Median != initial true Acp value

median 0.227714; q16 -0.0617727; q84 0.595368

count quantile at data: 0.143616

While 0.25 is already the largest value we will take (Bayesian approach), the real data is still close the region. We can conclude that Bayesian and frequentist approach coincide with each other. [NOT quite sure about this point!!]