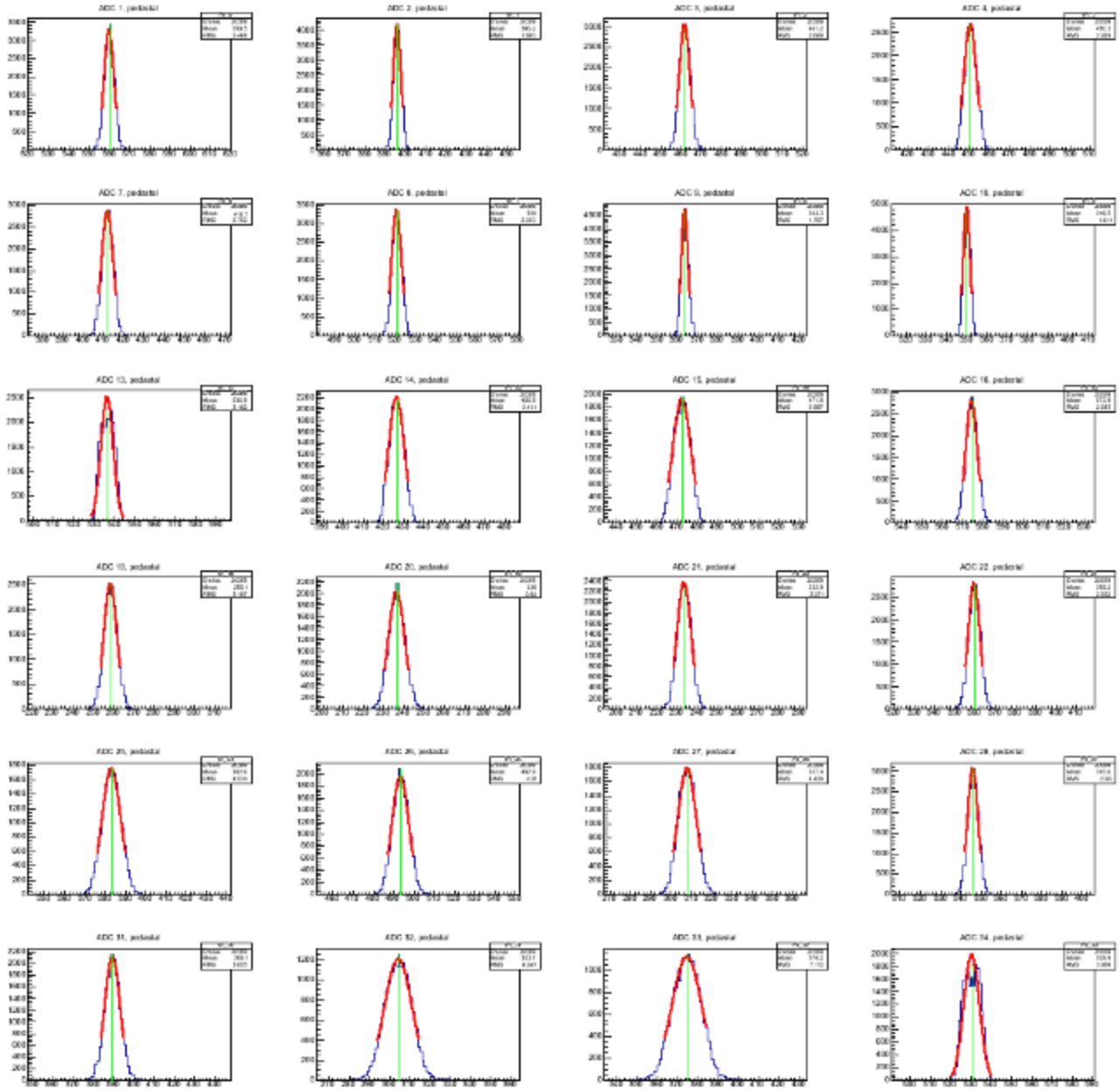
LHRS pion rejector 2

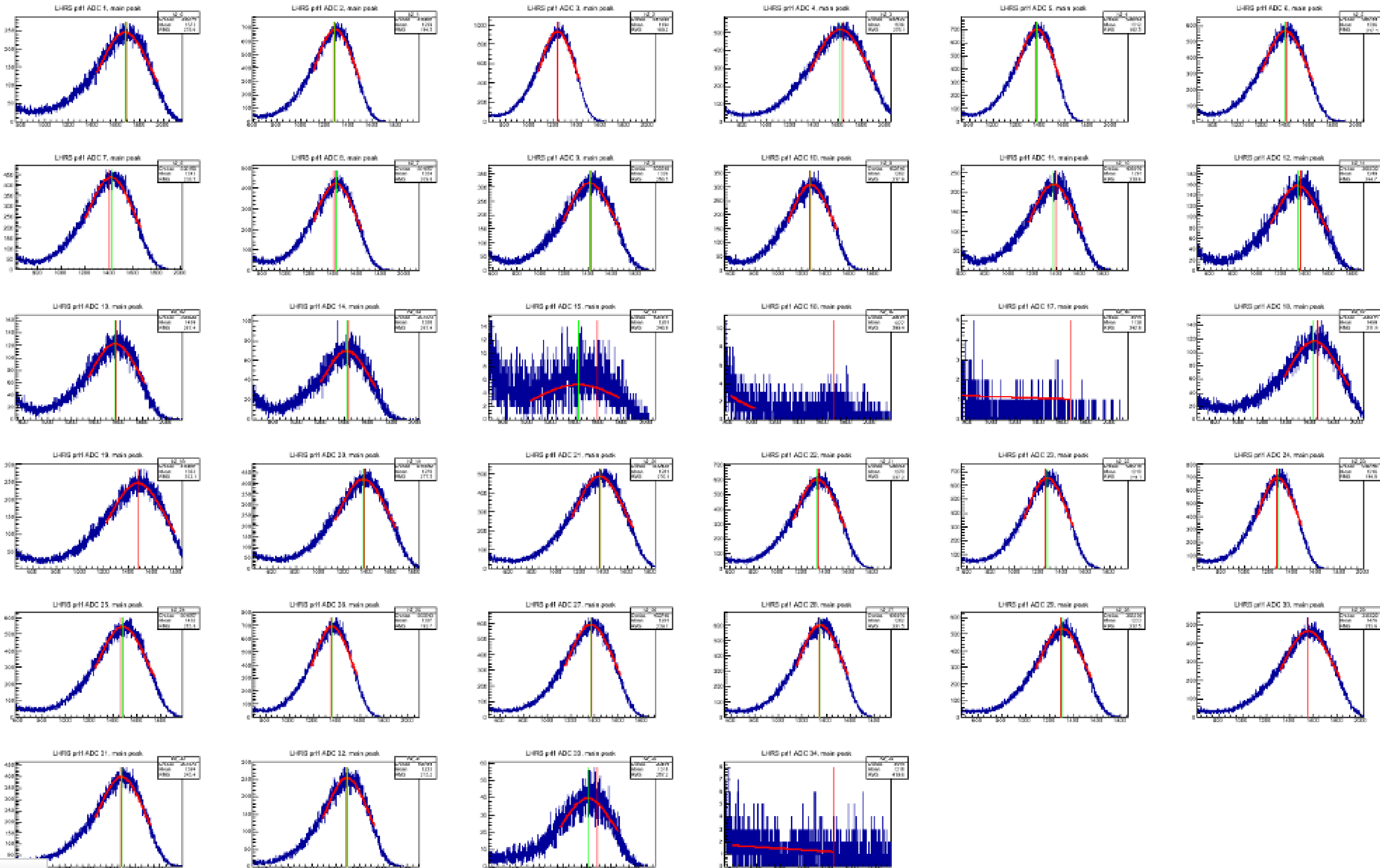
Steps:

a. Check pedestal
b. Align electron main peak, get first gain factor
c. Get the additional gain factor prl1 and prl2 by miminization

Prl1 pedestal

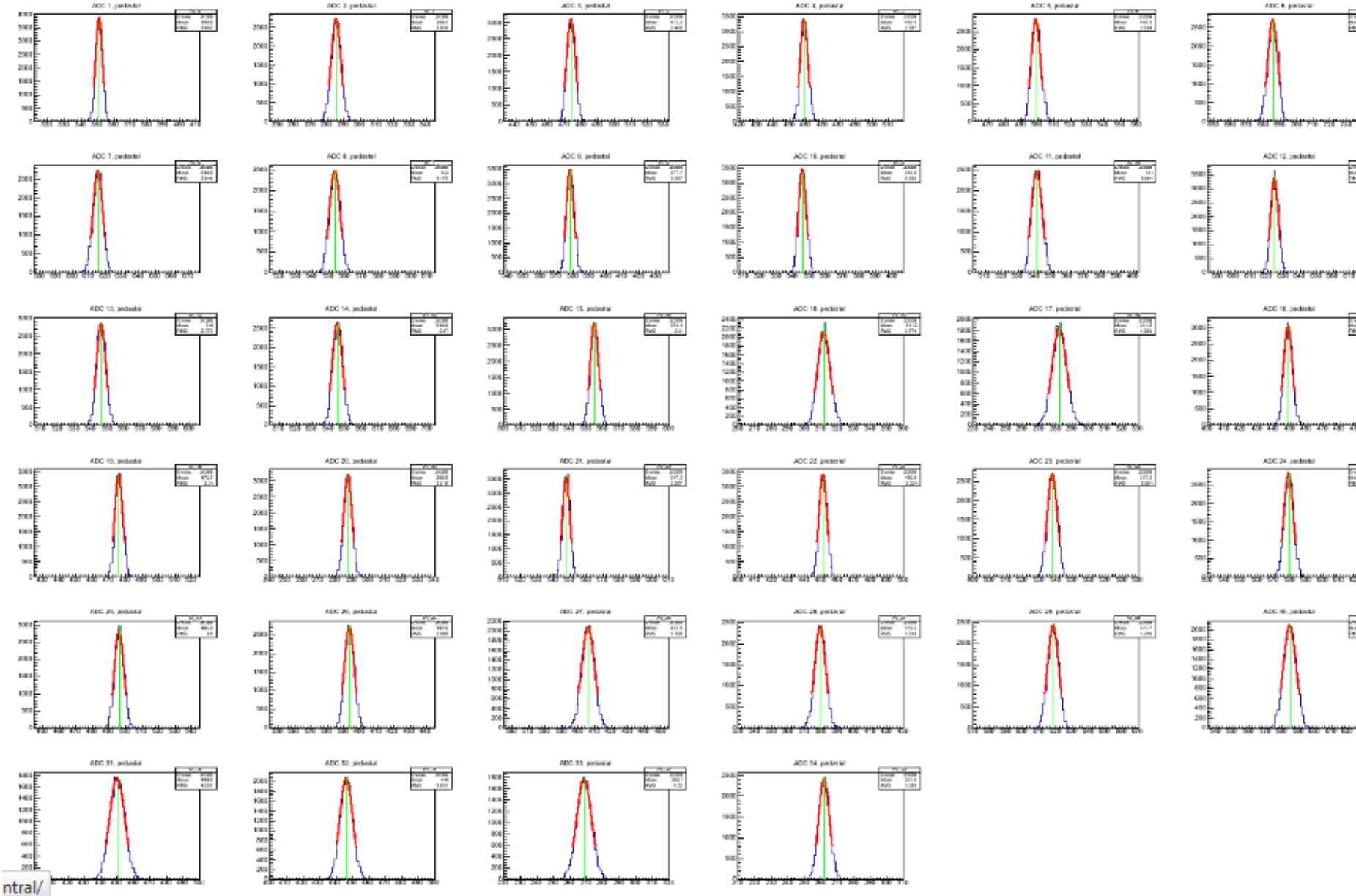


Prl1 main peak

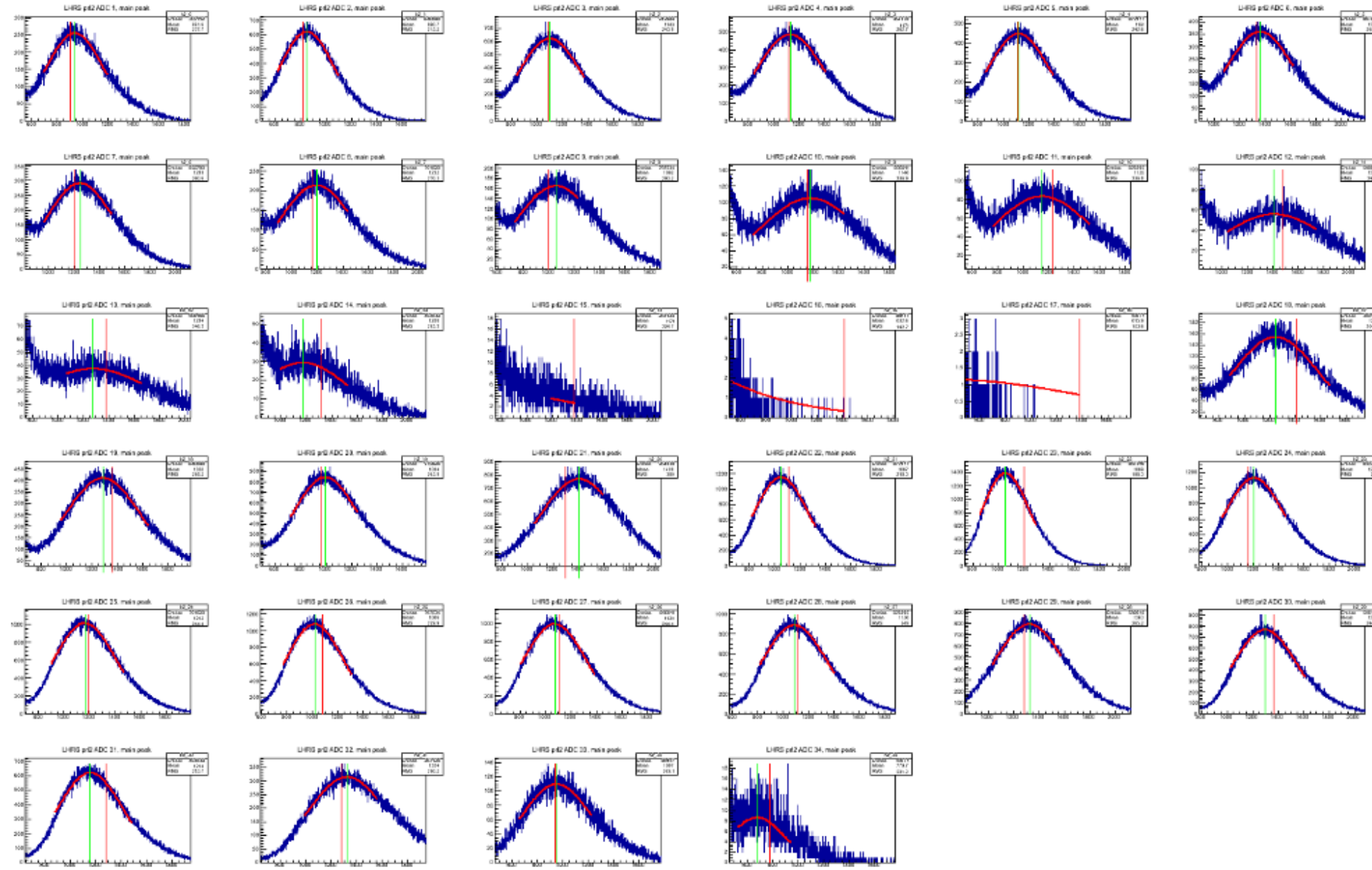


central/

Prl2 pedestal



Prl2 adc signal



- After aligning the main peak of each block in both prl1 and prl2 separately.
- Choose there momentum setting to do minimization
- Consider (approximate):
  1. longitudinal shower well obey gamma distribution:

     $$\frac{dE}{dt} = E_0 * \beta * (\beta * t)^{\alpha-1} * e^{-\beta * t}/\Gamma(\alpha)$$

     $$\frac{\alpha-1}{\beta} = \ln(\frac{E}{E_c})-1$$

  2. Transverse shower distribution:

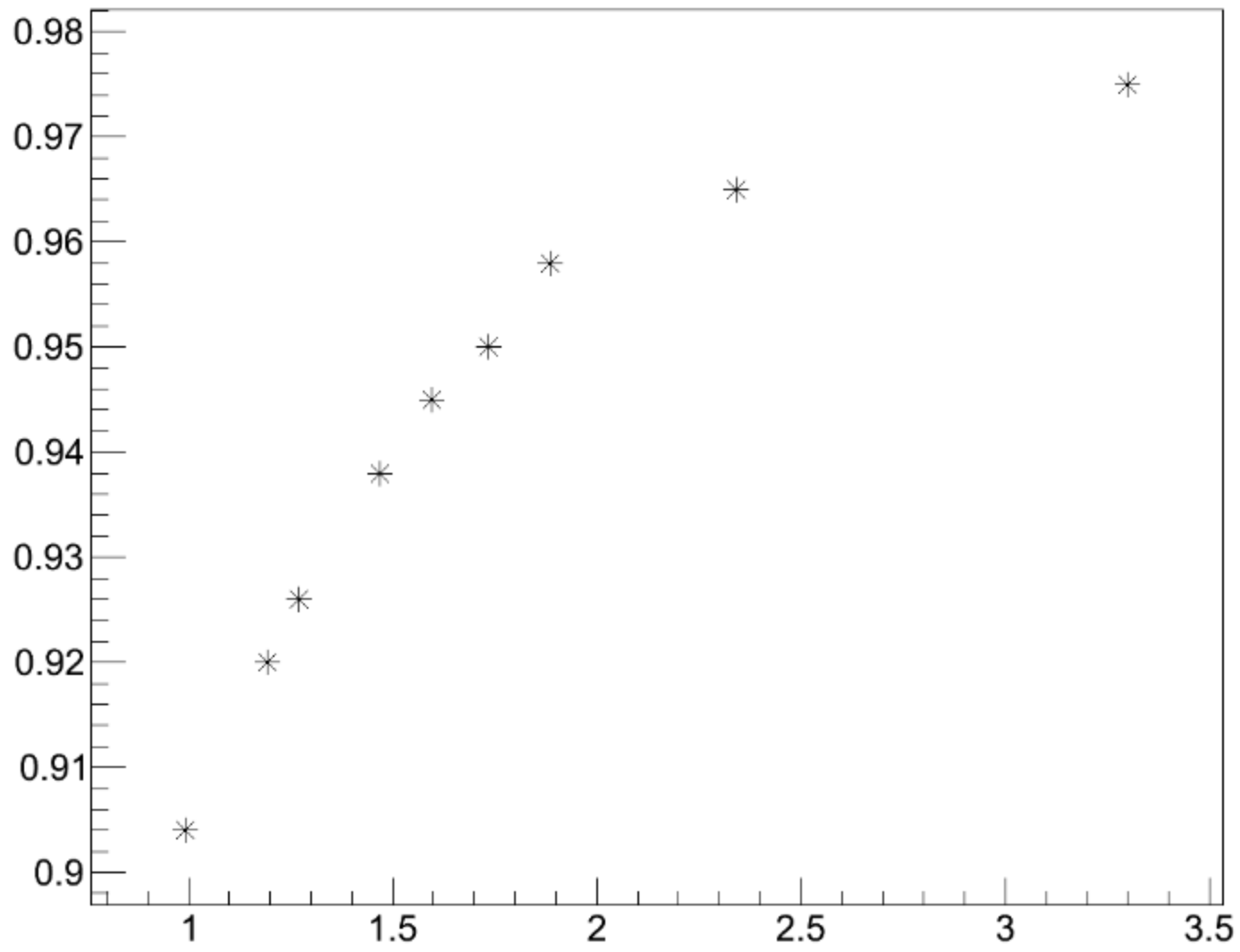
     block width: 14.5cm*30cm

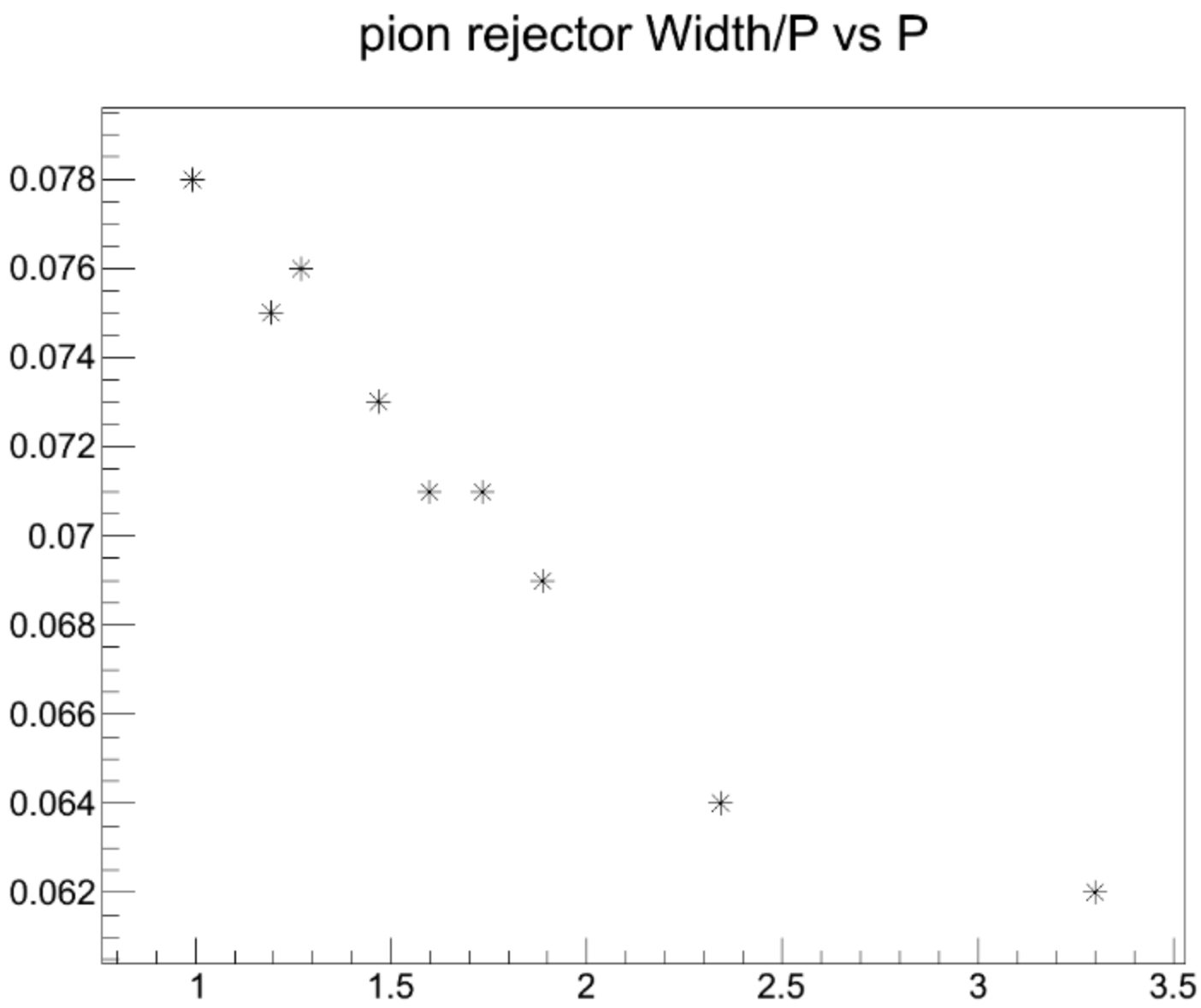
     x direction width: ~ $2R_m$ (95% deposited)

     y direction width: full deposited
- Gain factor:

  $$\rho * prl1 + \mu * prl2 = \int \frac{dE}{dt} * 0.975$$

  $parameter\ \mu, \rho, \beta$


pion rejector Etot/P vs P
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
1
1.5
2
2.5
3
3.5


pion rejector Width/P vs P
0.078
0.076
0.074
0.072
0.07
0.068
0.066
0.064
0.062
1
1.5
2
2.5
3
3.5