Pion and electron energy deposit distribution in TRD

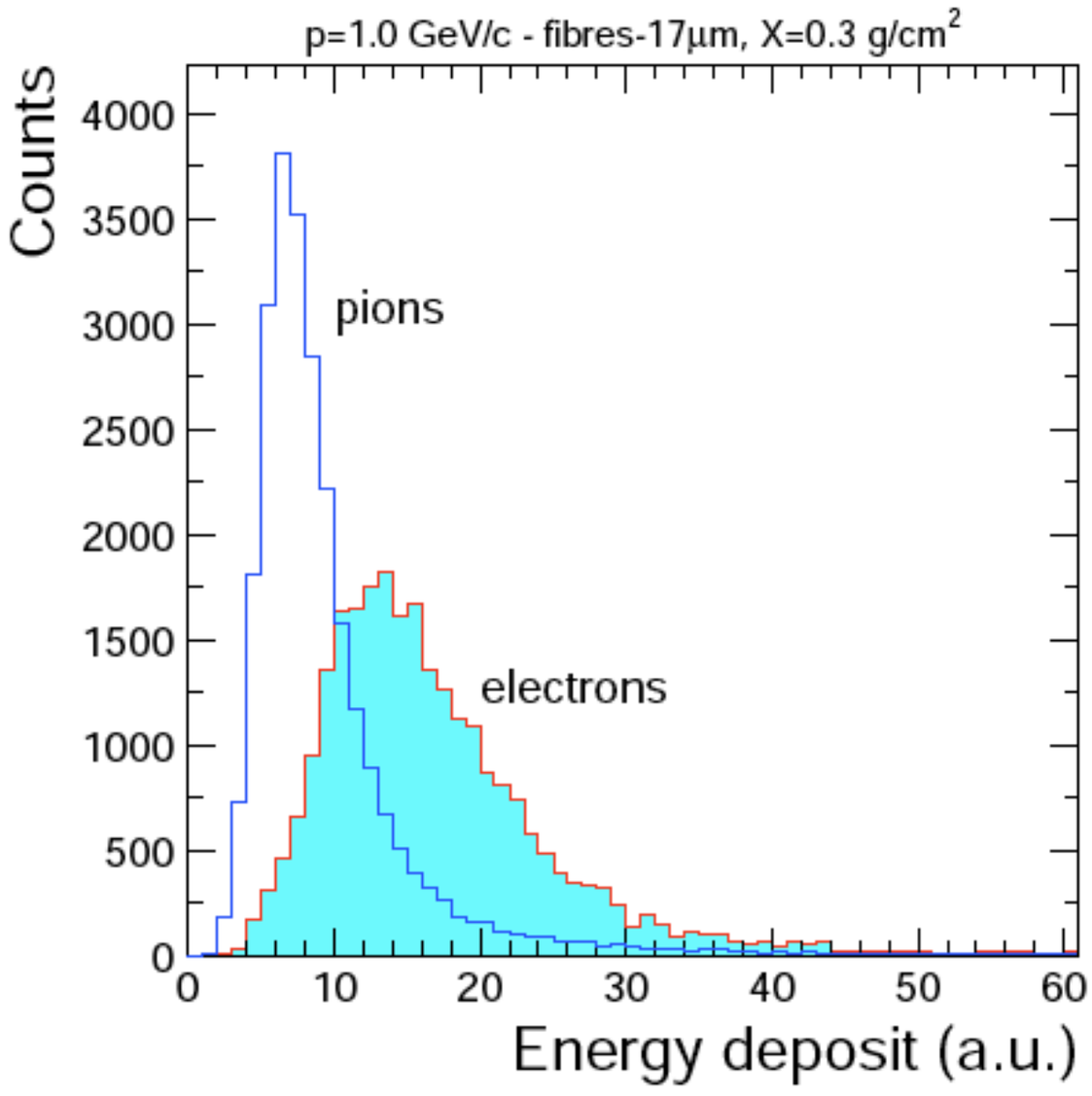


Figure 14.21: Integrated energy deposit for pions and electrons for a momentum of 1.0 GeV/c. A radiator with 17 μm fibre has been used.

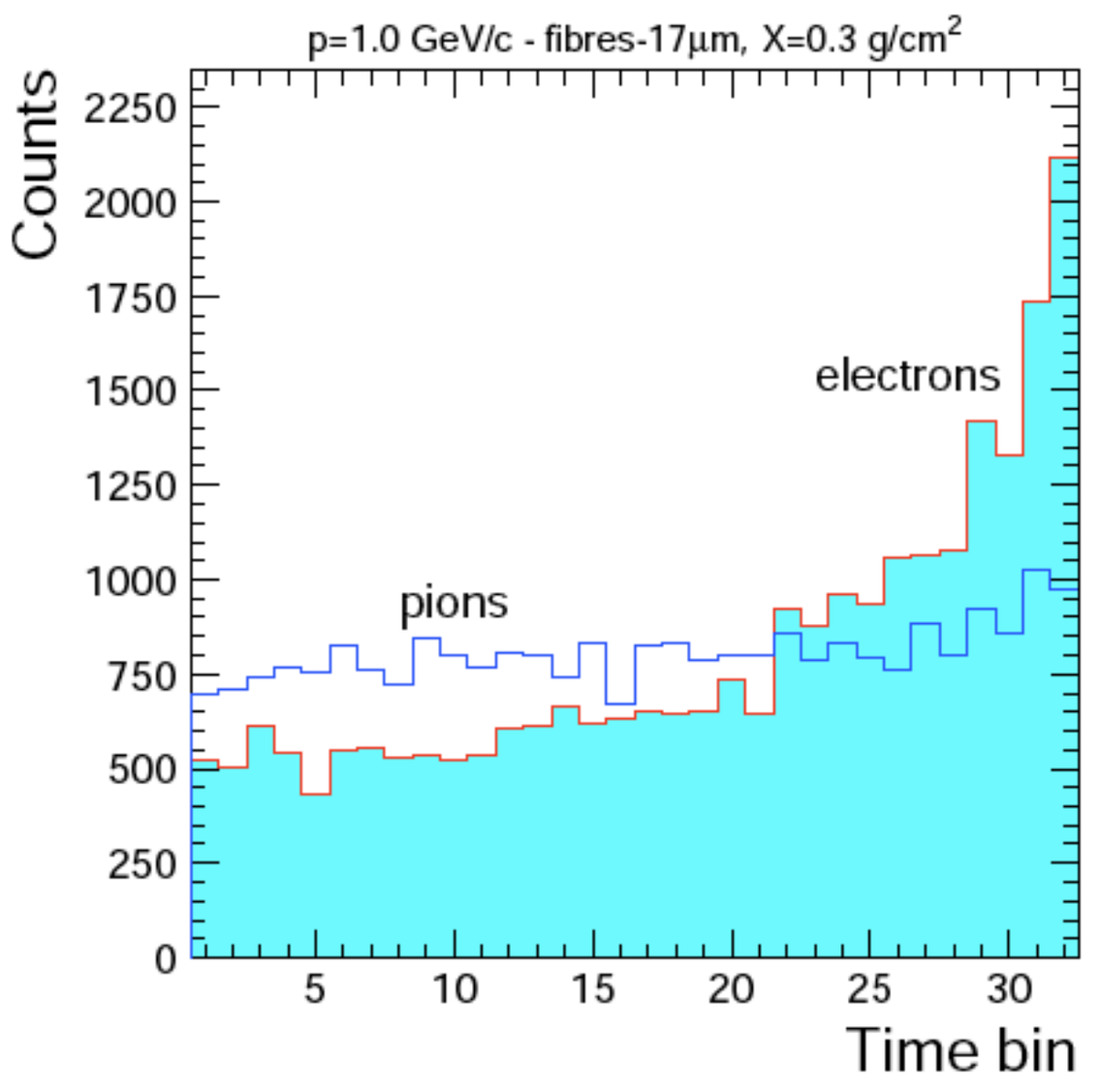
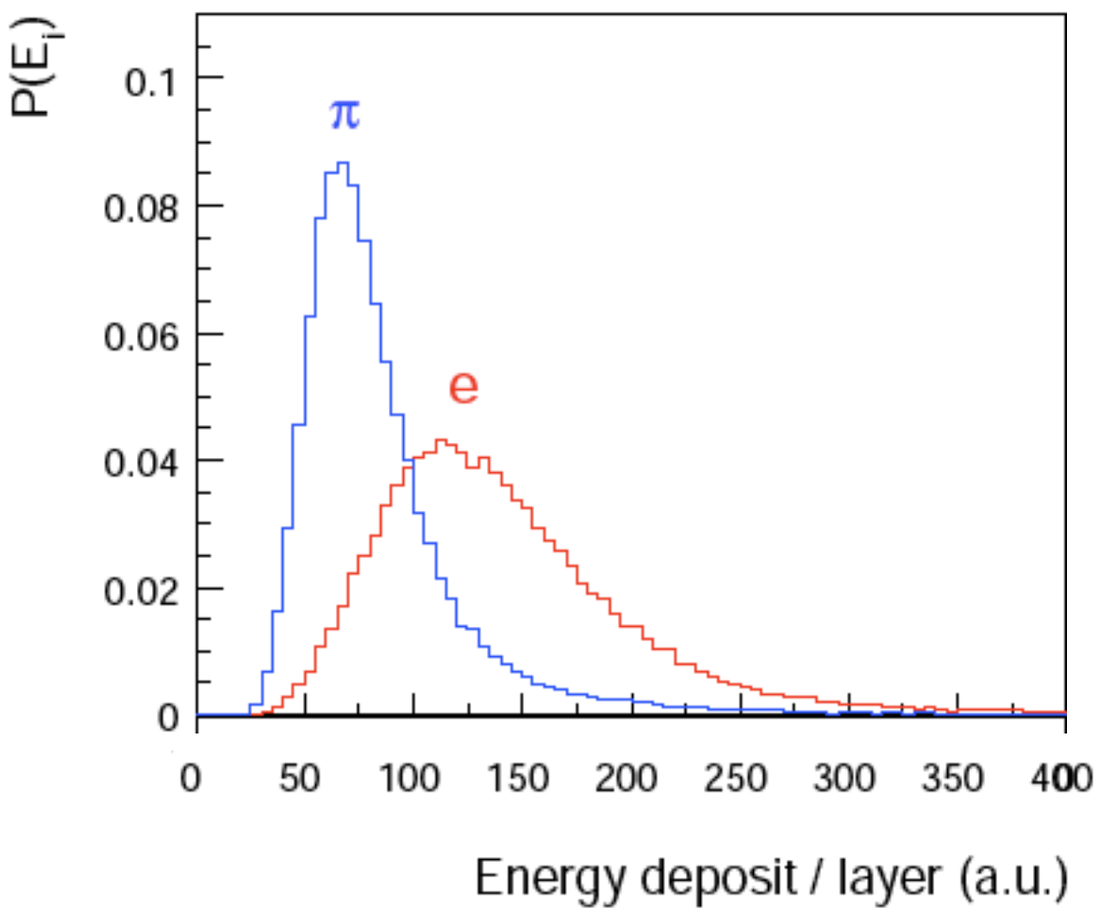
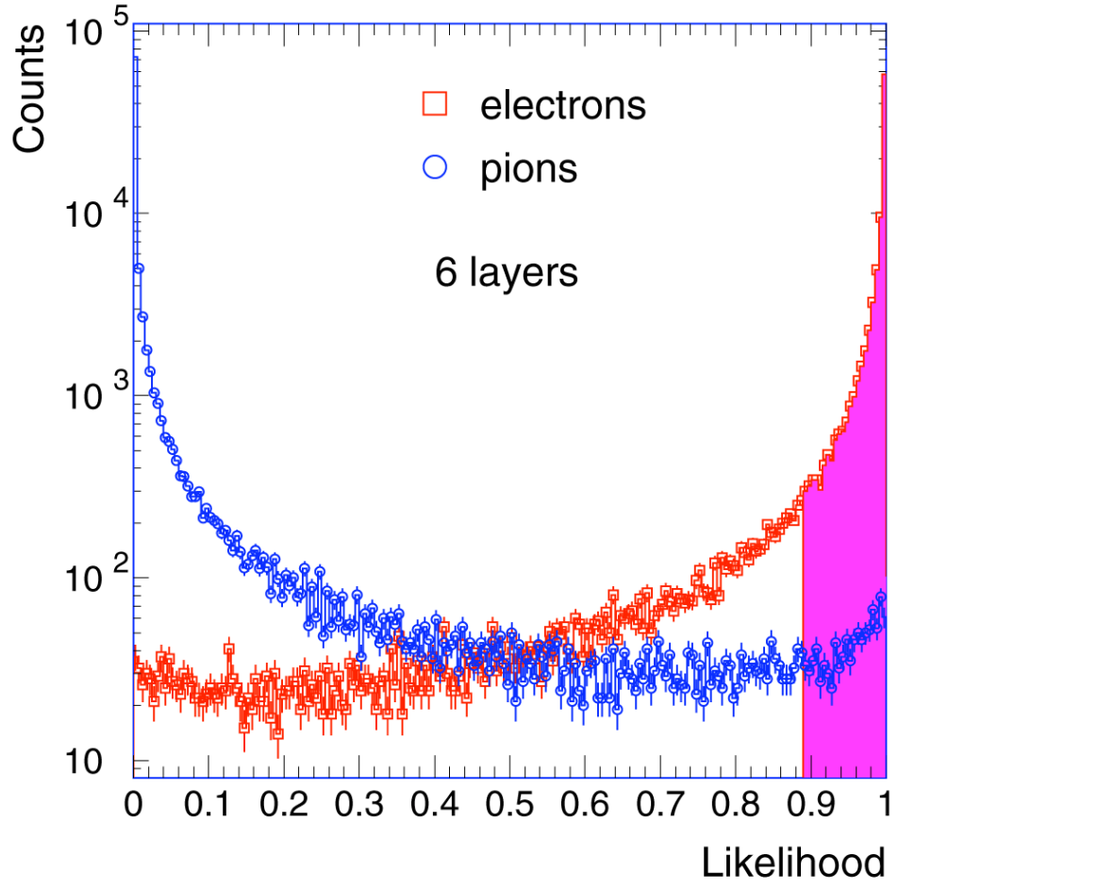


Figure 14.22: The distributions of position of the largest cluster found in the drift region for pions and electrons.

Determine likelihood - requiring reference distribution





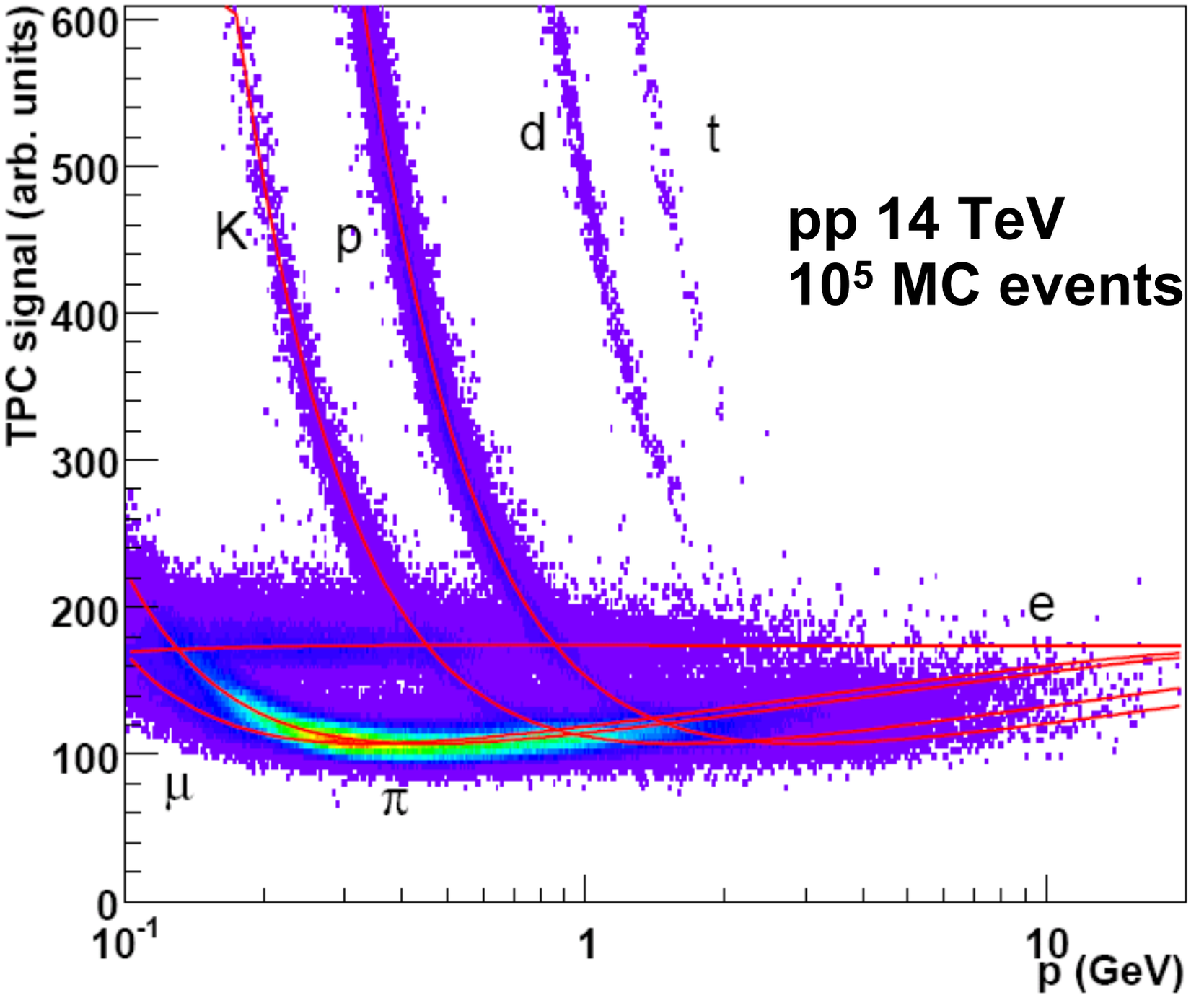
For a certain energy deposit E_i in layer i, $P(E_i|e)$ is the probability that it was produced by an electron and $P(E_i|\pi)$ is the probability that it was produced by a pion. The likelihood (to be an electron), L, is given by:

$$L = \frac{P_e}{P_e + P_\pi} \quad , \tag{14.2}$$

where

$$P_e = \prod_{i=1}^{N} P(E_i|e) \quad ; \quad P_\pi = \prod_{i=1}^{N} P(E_i|\pi). \tag{14.3}$$

How can we consider cosmic muon to establish pion reference distribution?



Here, I just listing what I have in mind so you can just consider them to put your own slide. :)

- Goal: comparing test beam result - we have 1,2,3,4,5,6 GeV pion data so that we can make a comparison. if this agrees well, we can even produce reference distribution for higher momentum

- Steps: we start from producing reference LQ method(left plot in the first slide), then can go further for LQX(right plot in the first slide) and Neural Network method

- you can get the plots and descriptions at: http://www-alice.gsi.de/trd/tdr/index.html (chapter 11, 14. Look at 14.3.5 in chapter 14)