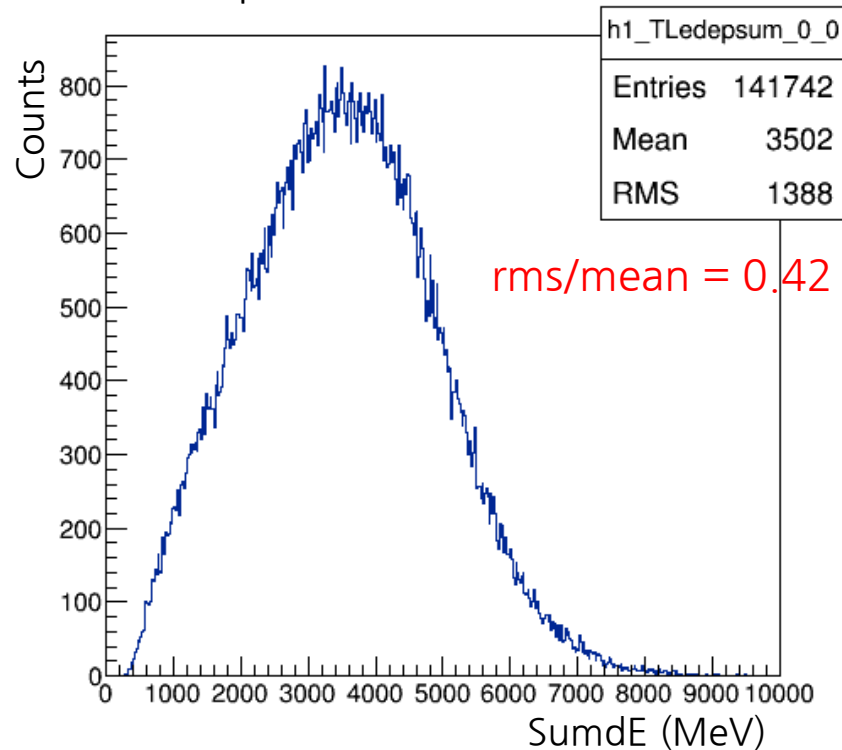


Improving neutron E resolution of RHICf detector

27 Feb. 2019
Minho Kim

SumdE distribution for 250 GeV neutron

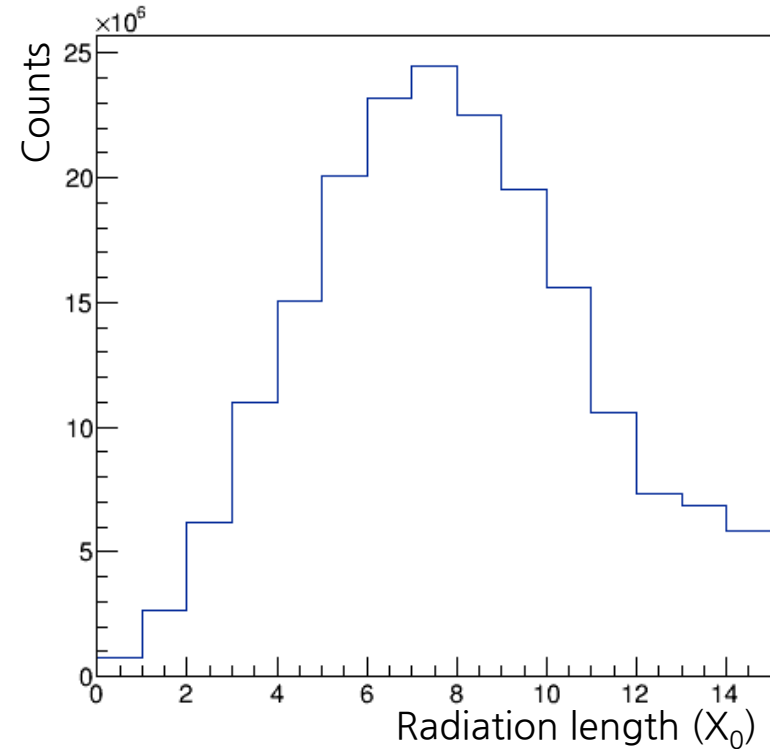
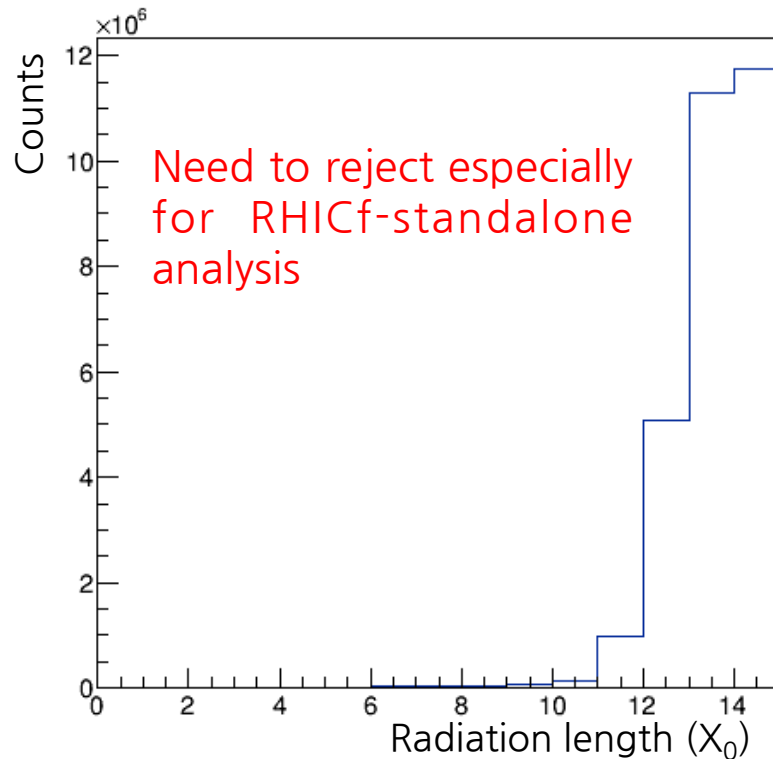
250 GeV neutron enters the center of TL at bottom position run.



- It looks two distributions with worse and better rms/mean area overlapped.
- It would better to extract the distribution with better resolution for the possible RHICf-standalone neutron preliminary.

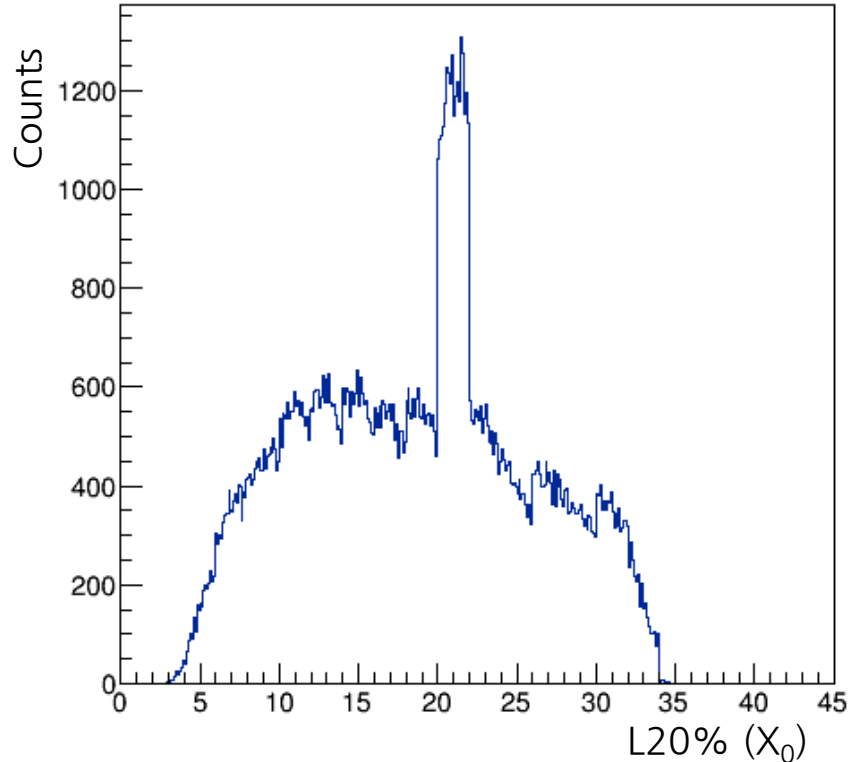
Cause of the worse neutron E resolution

- Insufficient radiation length makes the SumdE of neutron more fluctuated than $\text{rms}/\text{mean} = 0.4$.



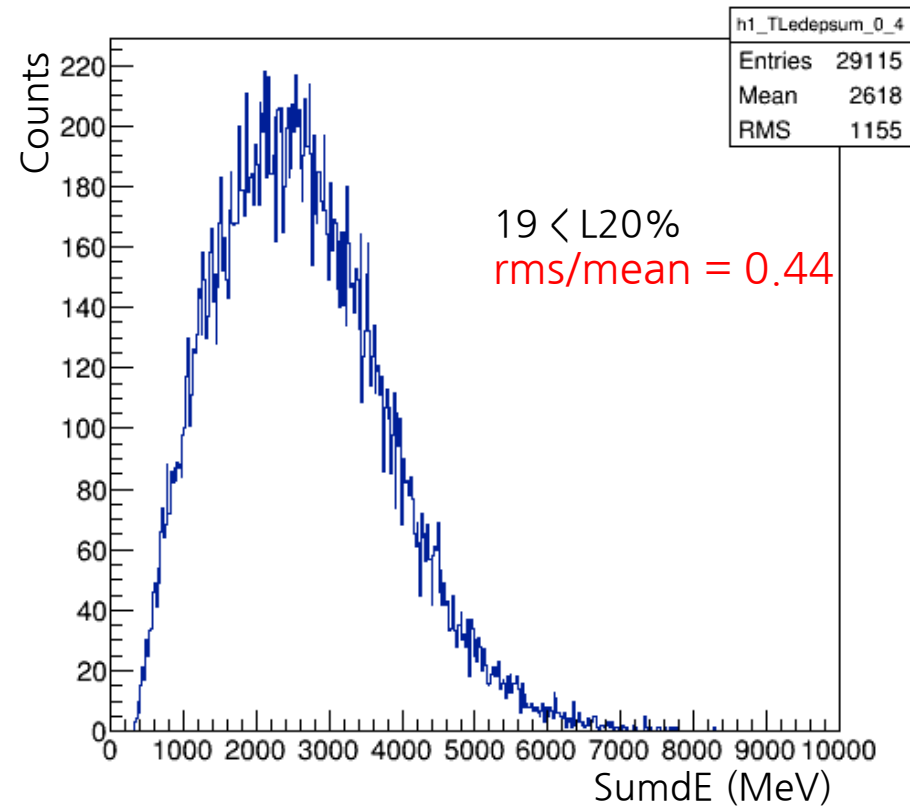
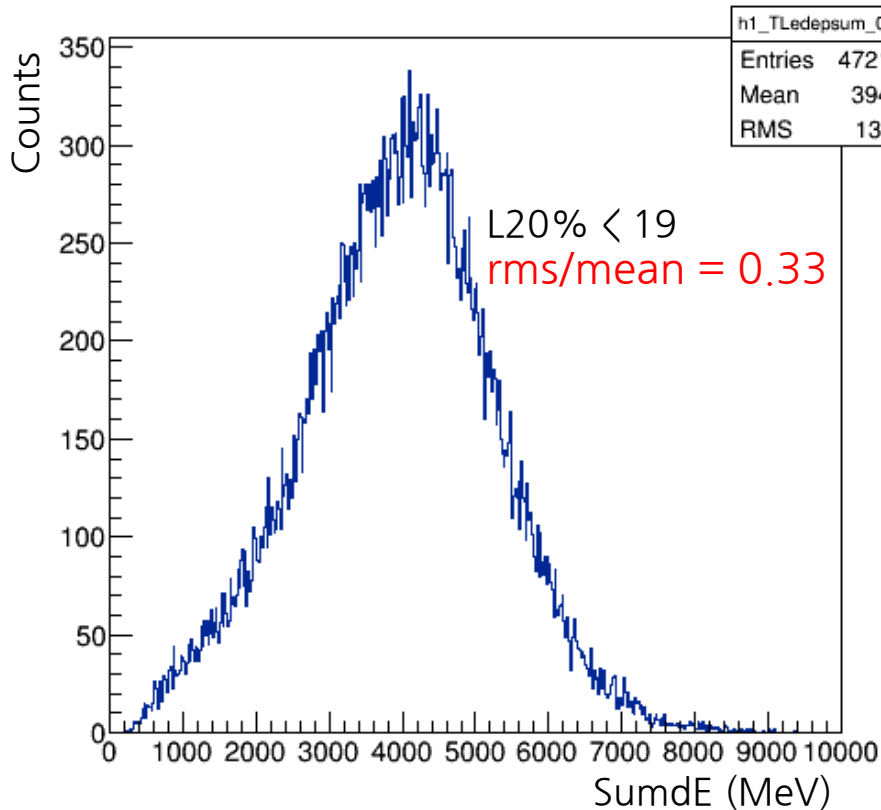
- Neutron E resolution will be improved by the events, which relatively well deposit the energy of shower particles.

L20% parameter



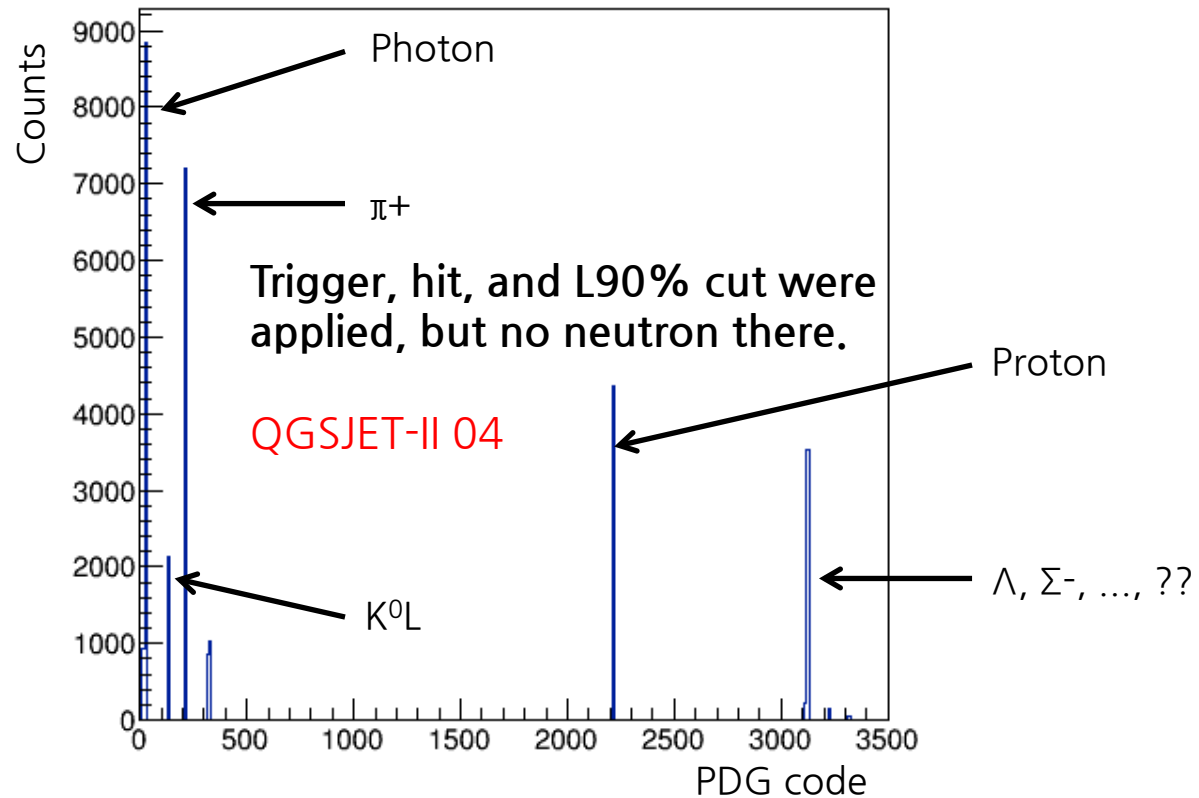
- Lower L20% means the starting point of the hadronic shower is more forward and therefore, the detector relatively measure the energy deposit well.
- We may apply L20% parameter by losing neutron statistics because we are free from neutron statistics.

Improving neutron E resolution by L20%



- L20% cut can make the neutron E resolution better.
- Because the value of L20% is randomly determined, It will not take any effect to A_N .

Background of neutron cut condition



- Additional condition to increase the true neutron ratio is being studied.