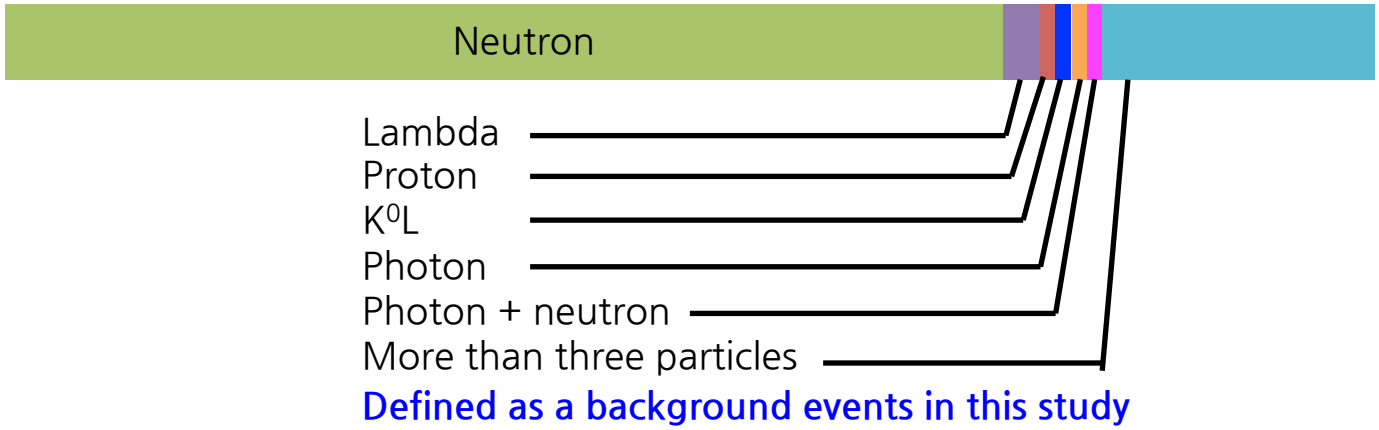
Component of the shower-triggered events

01 Apr. 2019

Minho Kim

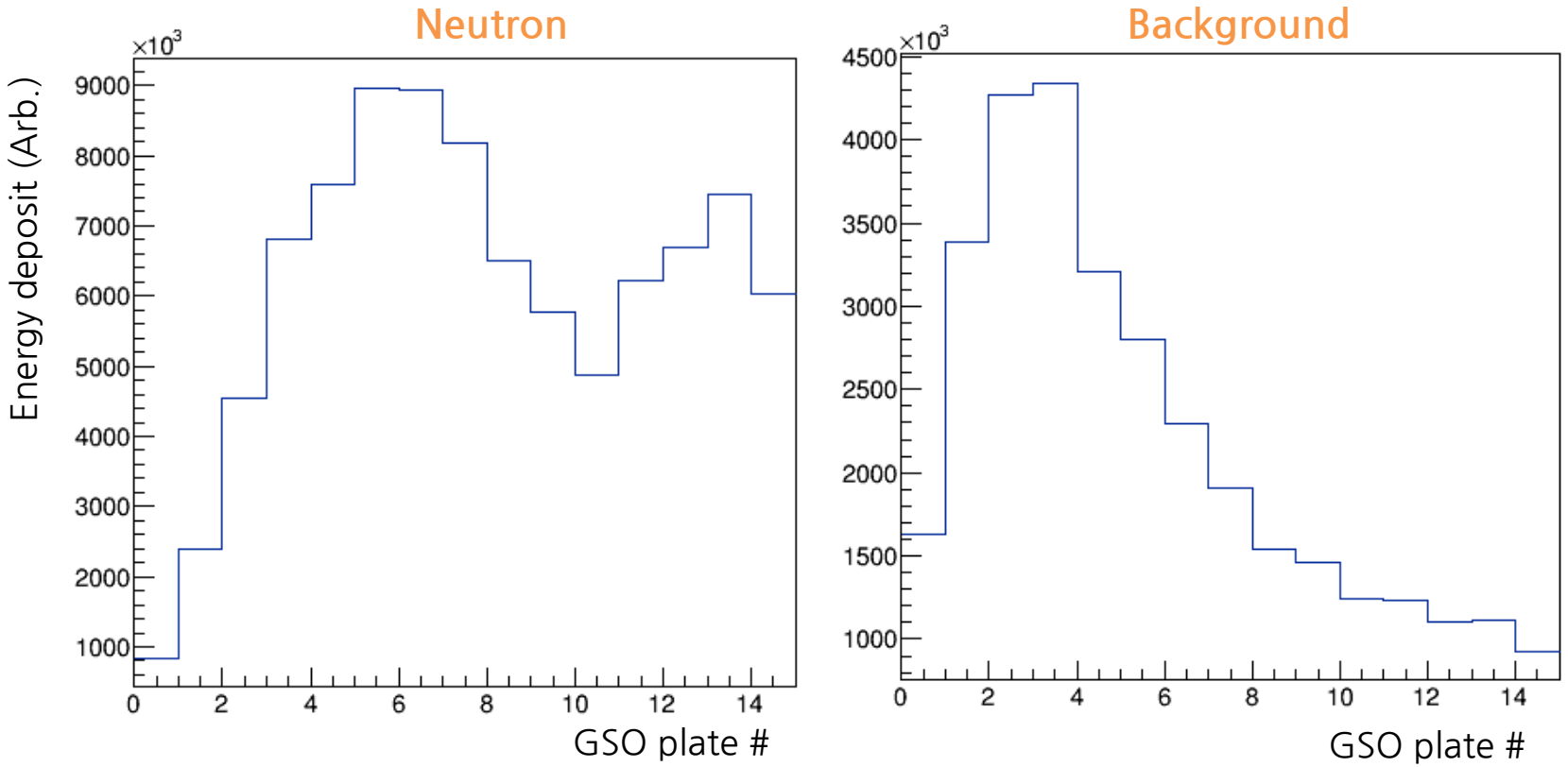
Component of the shower-triggered event

Shower trigger + L90 > 20 (QGSJET-II 04)



- Neutron ratio can be improved by studying the difference of the detector response when the neutron enters the detector and the others.
- RHICf detector may reconstruct the Λ by two photon in TL and a neutron in TS.

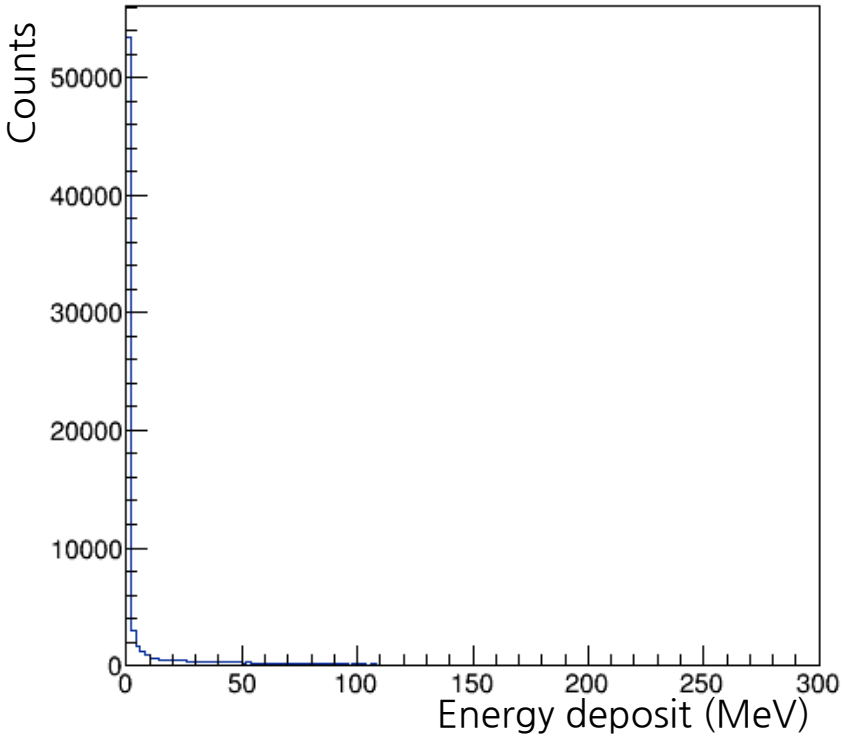
Difference between the neutron and Bg.



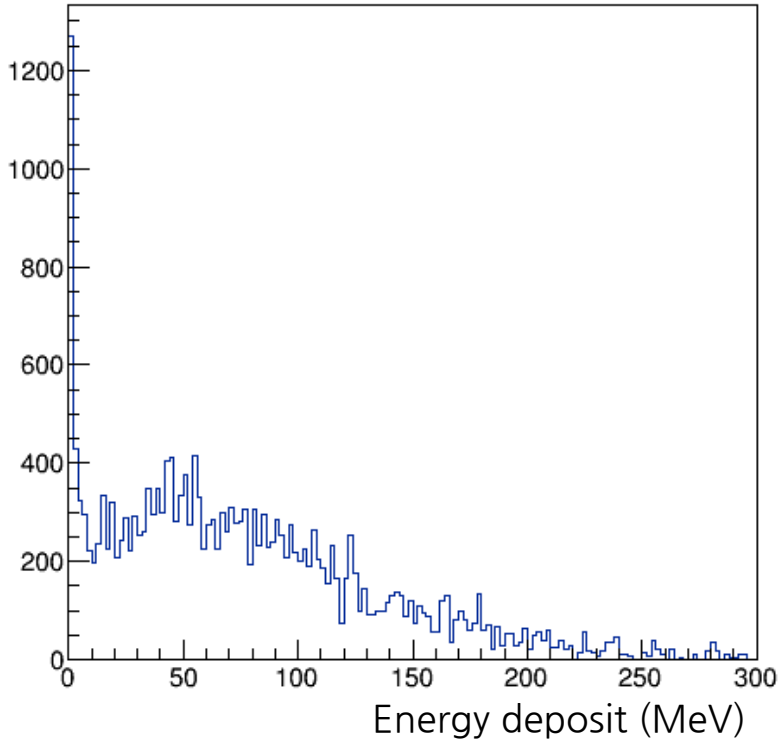
- First peak of neutron is the events where the shower started before the thicker tungsten.
- Peak position of background events is usually more forward than neutron due to the charged particles.

Energy deposit of first GSO plate

Neutron



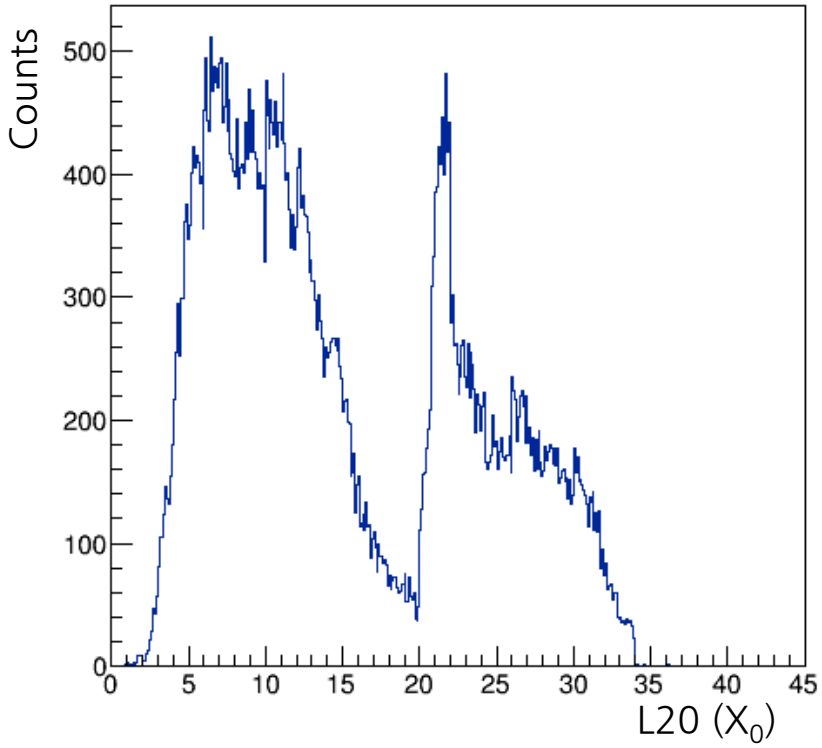
Background



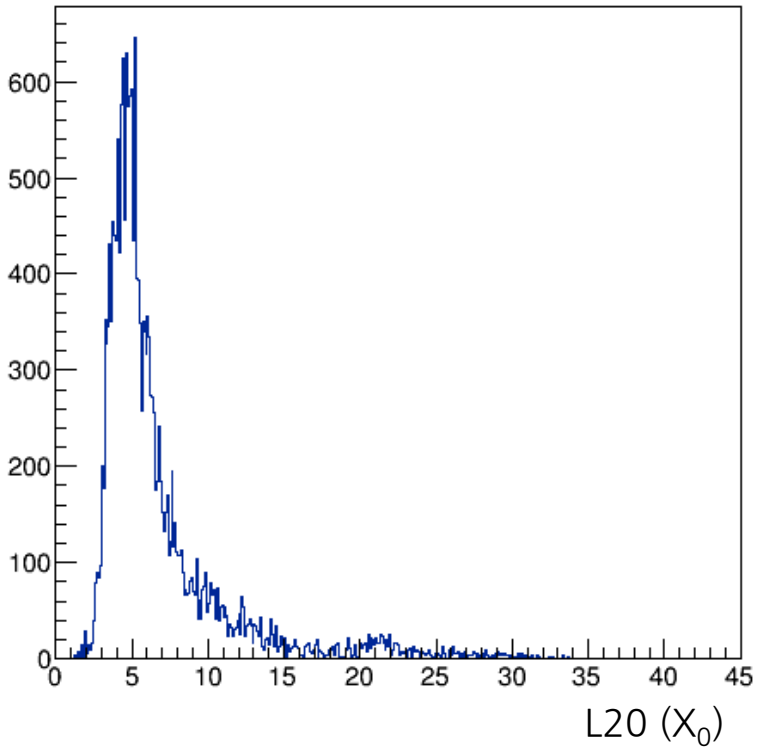
- First GSO plate can be used for the veto counter of the background events.

L20 distribution

Neutron

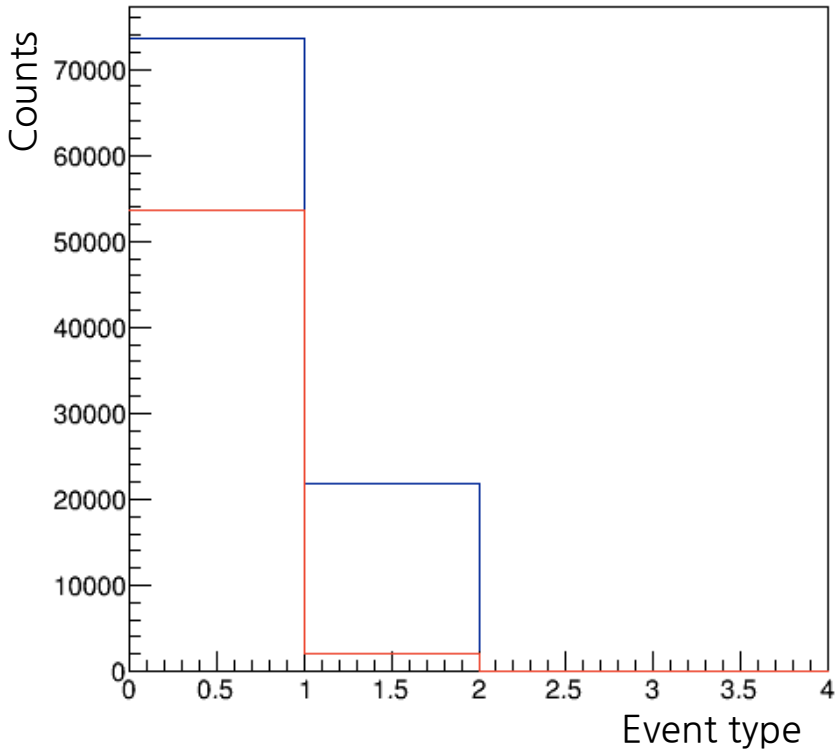


Background



- L20 of background events is biased to smaller values.
- Combination of L20 and energy deposit of first GSO plate should be used to increase the neutron ratio in shower-triggered events.

Improved neutron ratio



0: neutron
1: background

Previous condition
New condition: L20 > 8 + Edep(1) < 10 MeV was applied

- With the new condition, 27% of neutron and 91% of background is expected to be suppressed.
- With the new condition, neutron ratio can be improved from 78% to 96%.