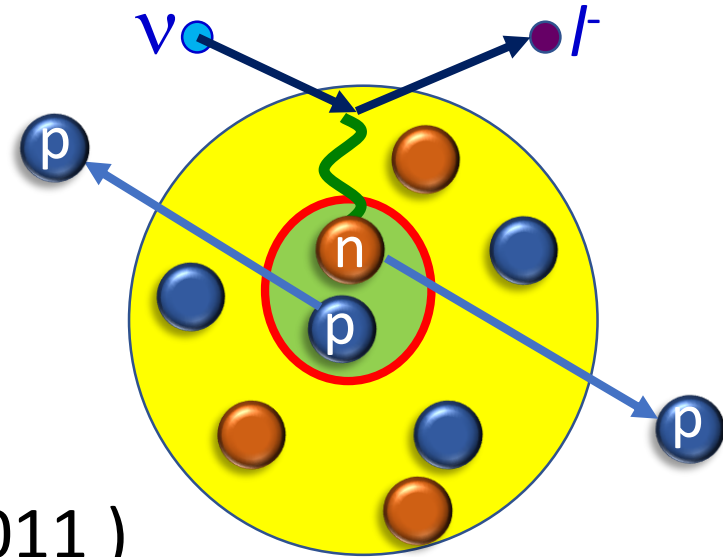


2p2h in NEUT

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2p2h model in NEUT

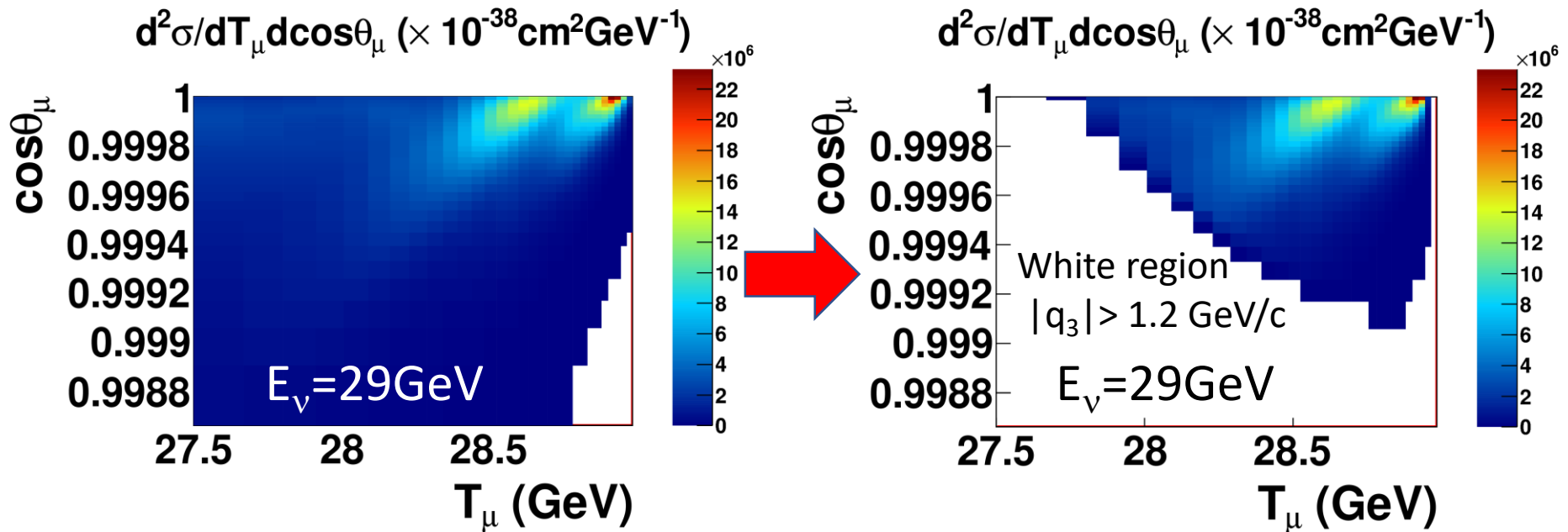


- Reference model
 - J. Nieves et al.
Phys. Rev. C. 83 045501 (2011)
 - High energy extension
 - ~ R. Gran et al. Phys. Rev. D88 113007 (2013)
 - Nucleon scattering handling
 - ~ based on prescription by J. Sobczyk
Phys. Rev. C86 015504 (2011)
 - 2 implementations
 - Tabulated differential cross-sections
 - Tabulated hadron tensor
- 

2p2h model in NEUT

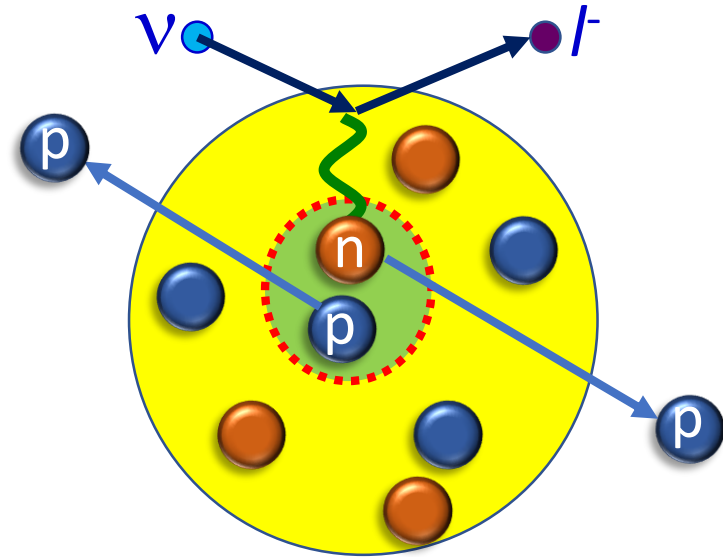
- Lepton kinematics (T_μ , $\cos\theta_\mu$)
 - Use pre-calculated 2D lookup table.
(Because of this, only ^{12}C , ^{16}O and ^{40}Ca are included.)
 - User pre-calculated hadron-tensor table.

Apply $|q_3| < 1.2 \text{ GeV}/c$ constraint

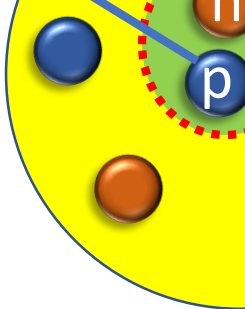


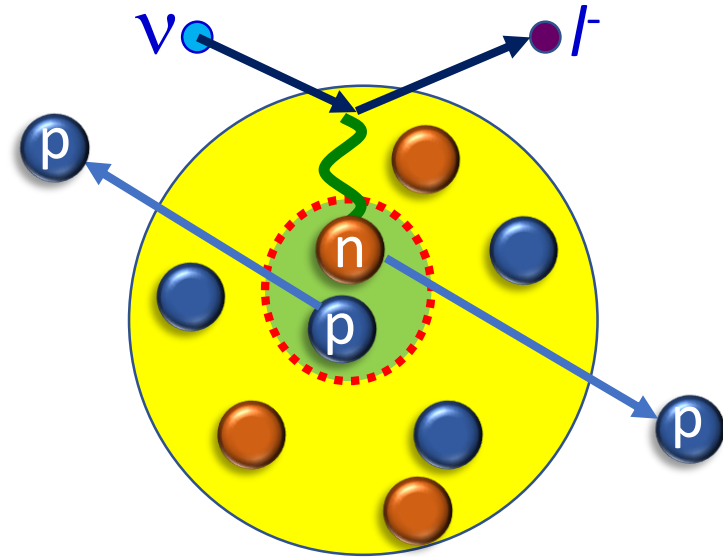
2p2h model in NEUT

- Hadron (nucleon) kinematics
 - Initial state nucleons
 - Uncorrelated two nucleons
 - Momentum distribution is same as 1p1h
 - Final state nucleons
 - Transferred energy is shared equally between two outgoing nucleons
 - Energy is conserved
 - Additional re-scattering is handled just as same as the other interactions.



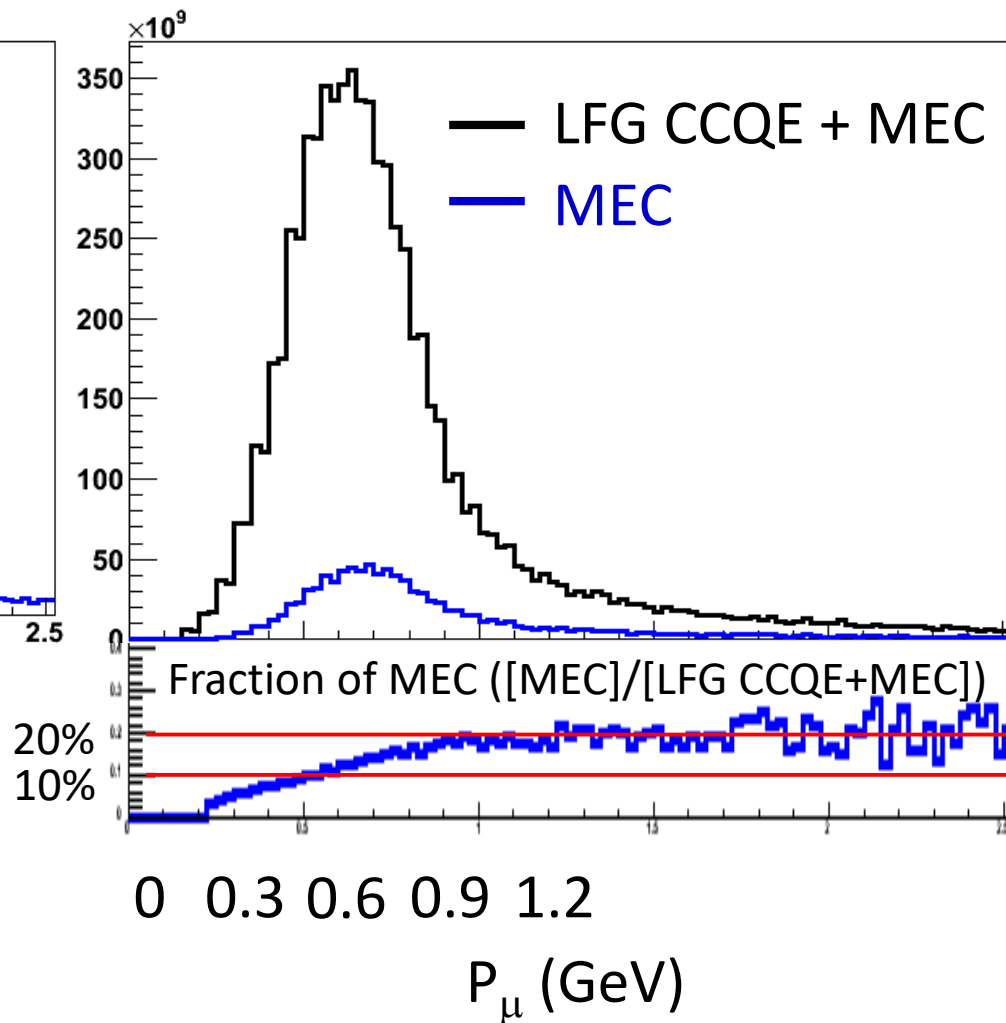
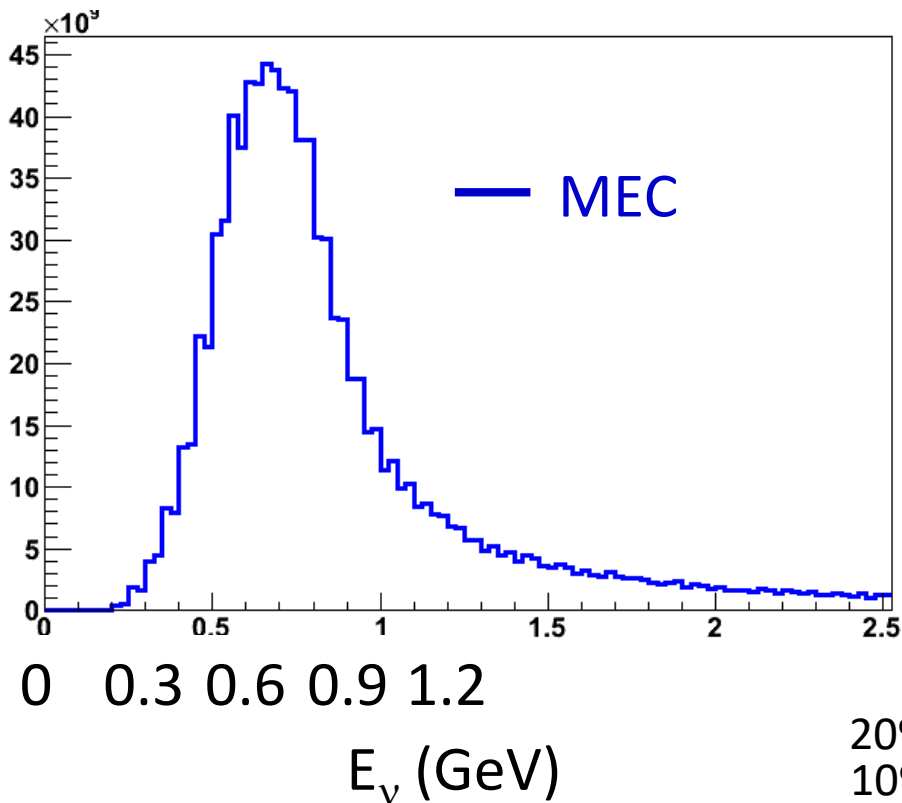
2p2h model in NEUT

- Hadron (nucleon) kinematics
 - 0) Calculate energy transfer to the hadron system.
 - 1) Fix two uncorrelated nucleon momenta.
 - 2) Boost CMS frame of nucleon system.
 - 3) Give half of the transfer energy to each nucleon.
 - 4) Eject direction of two nucleon isotropically.
 - 5) Boost back to the LAB frame.
 - 6) Check the Pauli-blocking condition.
(If not satisfied, go to 1)
- 
- A diagram of a yellow nucleus with several blue and red spheres representing nucleons. A green circle labeled 'p' is shown, representing a proton, with a red dashed line around it. A blue line connects the proton to the nucleus.



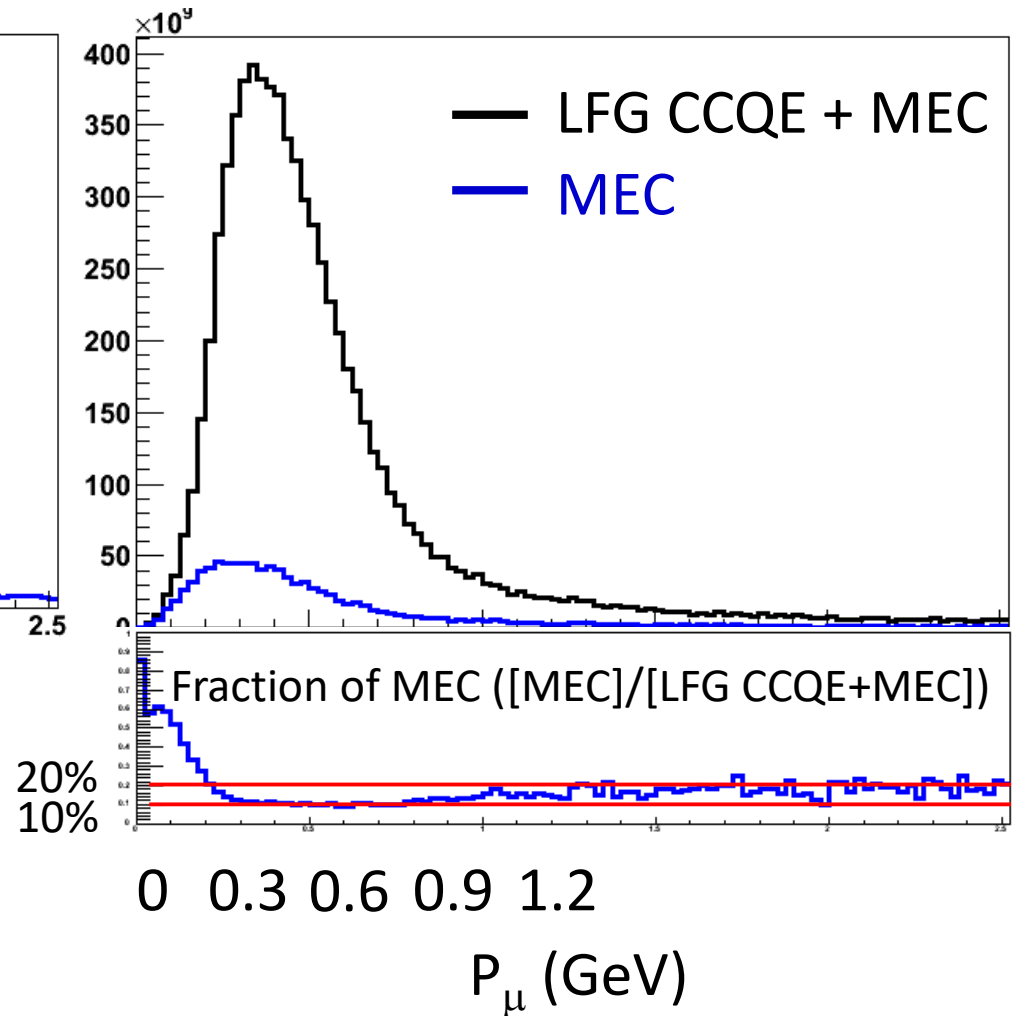
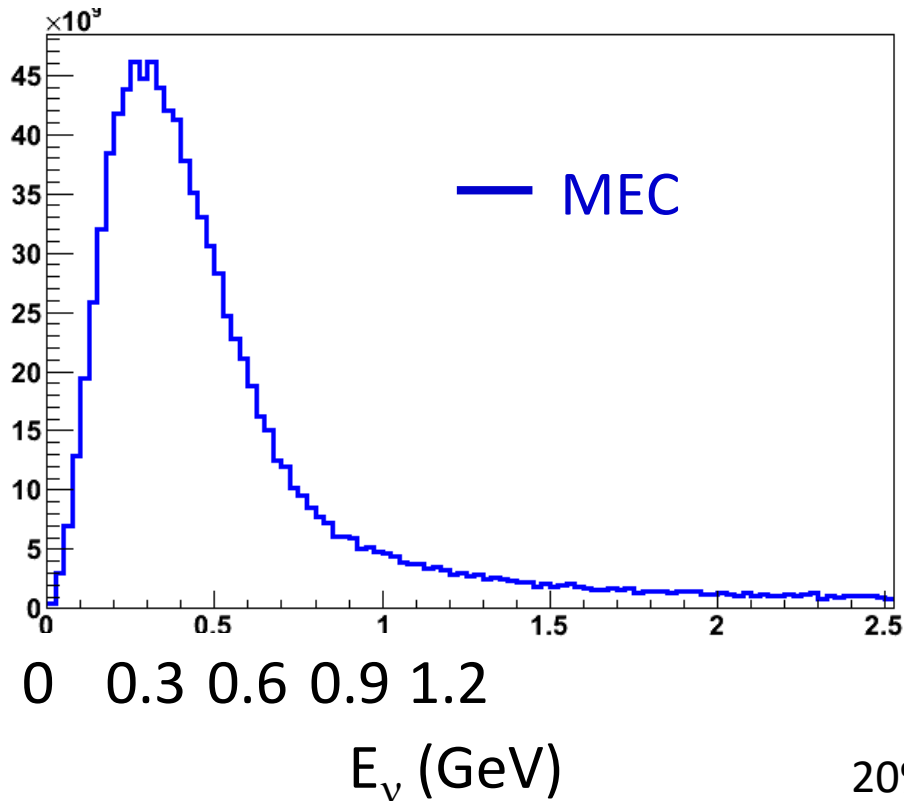
2p2h model in NEUT

E_ν distribution



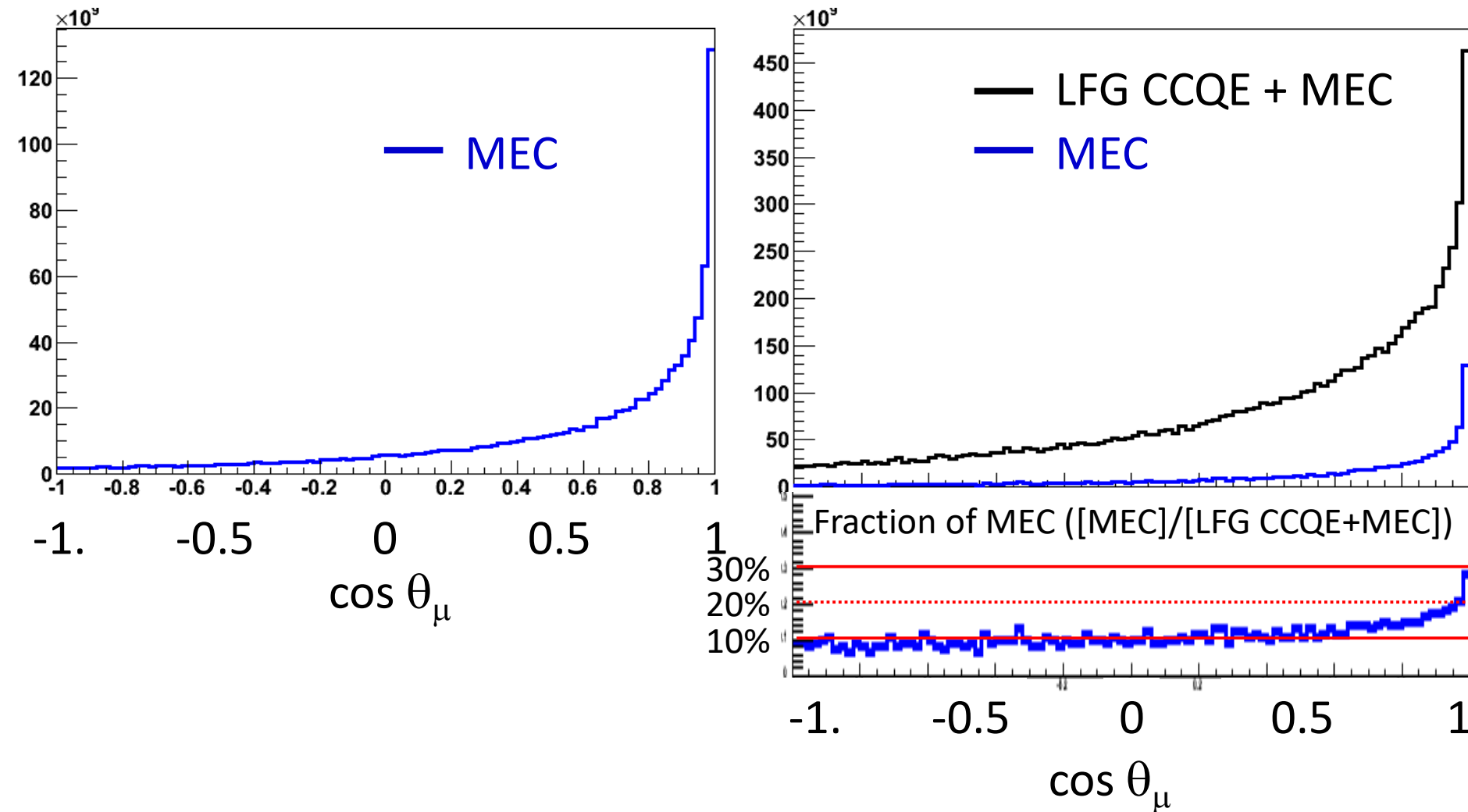
2p2h model in NEUT

Outgoing μ^- momentum



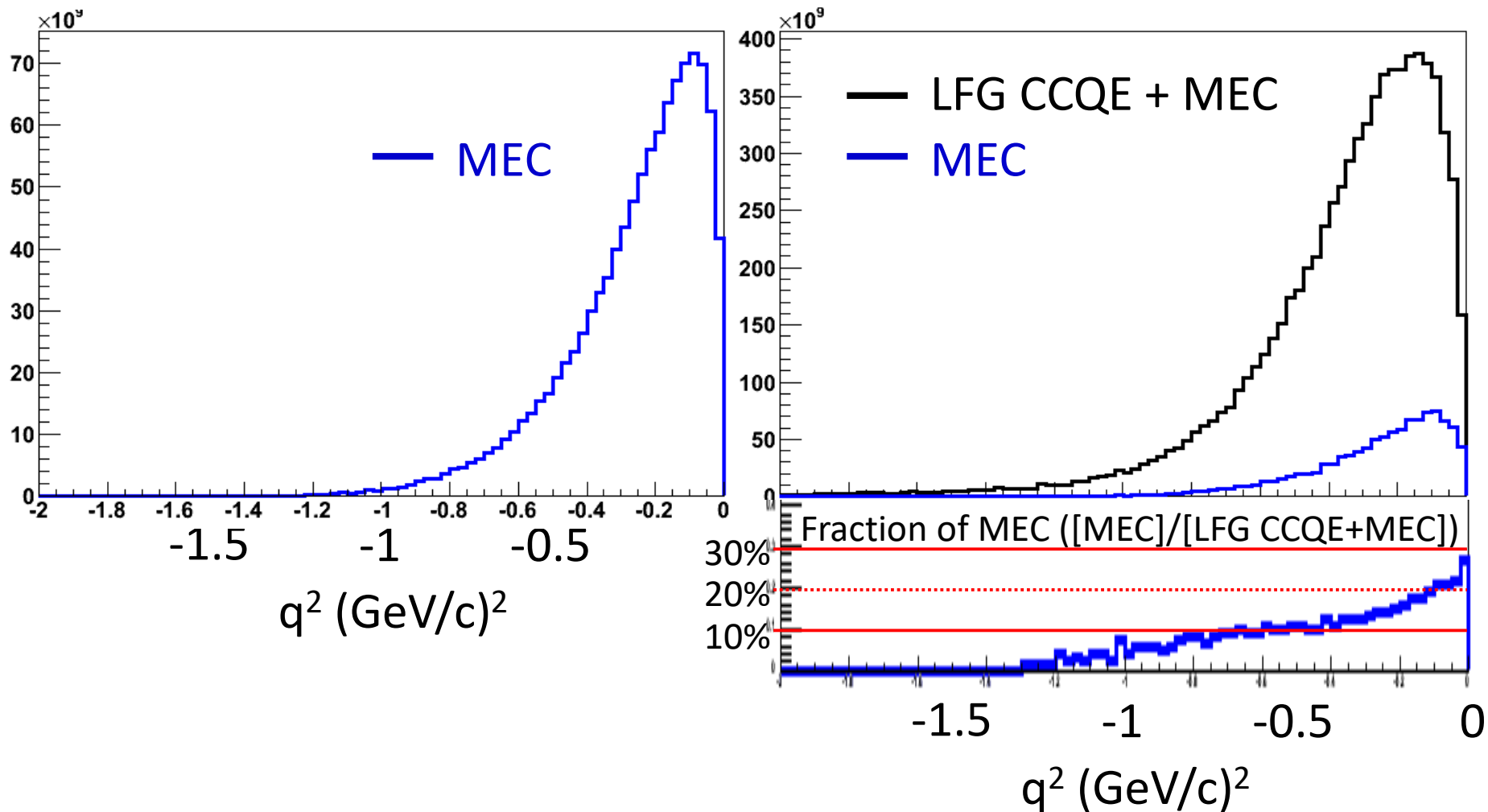
2p2h model in NEUT

Outgoing μ^- direction



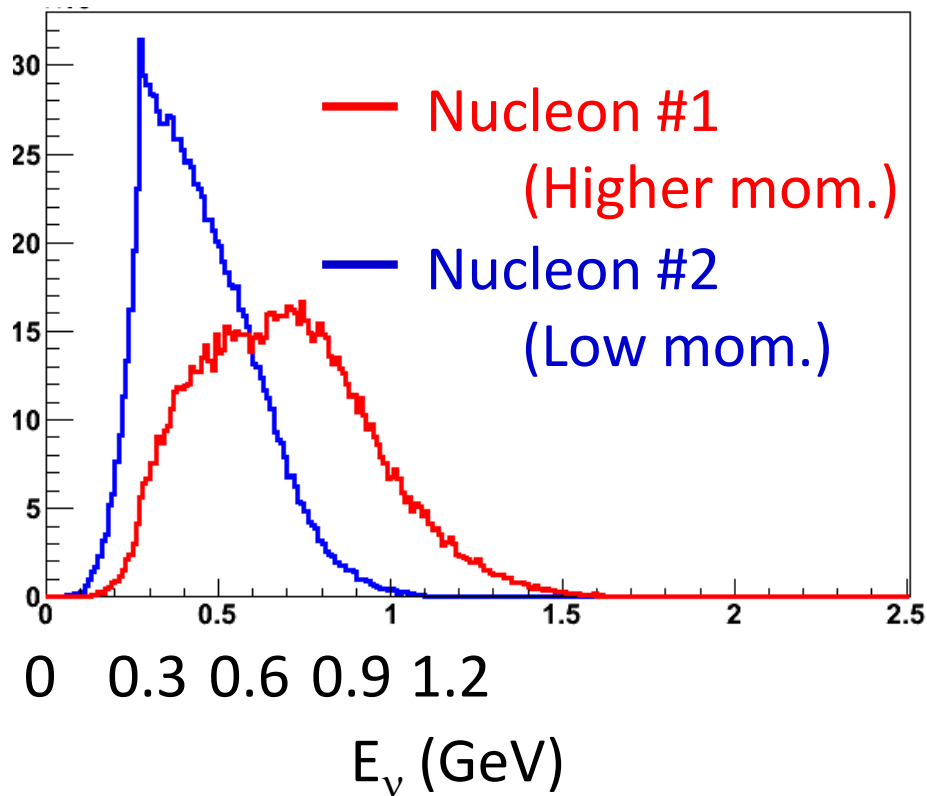
2p2h model in NEUT

q^2 distribution



2p2h model in NEUT

Outgoing momenta of nucleons



Opening angle of 2 nucleons

