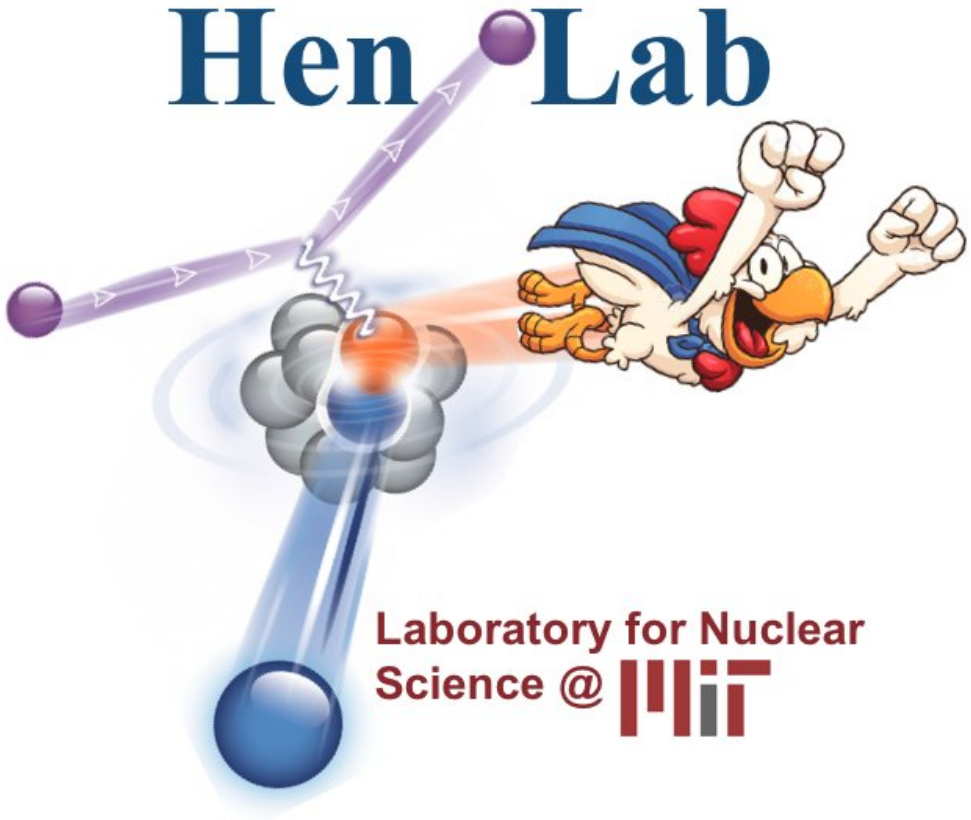
Updates for EM events



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On behalf of the MIT-Nuclear Group
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e4ν Effort

Benchmark GENIE
against electron scattering events

Why?

- Very similar interactions (vector part)
- Nuclear effects practically identical
- Known beam energy

Our Approach

- Identify potential issues
specific for EM interactions

- Consistent treatment of
neutrinos and electrons in our code

* 3 relevant changes pushed into the master branch

Berger–Sehgal Model

Issue in coupling constants

- Though EM interactions, constant weak coupling was used
- Replaced by EM coupling, which depends on $1/Q^2$

RES Event Generator

Different event generation processes

- Uniform in Q^2 & W for electrons
- Sampling envelope for neutrinos

RES Event Generator

- Verified that the two methods result in the same output
- Merged code to use sampling envelope in both cases

Kinematic Limits & Utilities

- Different Q^2 thresholds

  - 0.02 (GeV^2/c^2) for electrons
  - 10^{-4} (GeV^2/c^2) for neutrinos

- Mass of incoming particle ignored in calculation of kinematic quantities

Kinematic Limits & Utilities

Introduction of new namespace
for EM interactions
(many thanks to Marco!)

- Q^2 threshold set to 0.02 (GeV^2/c^2)
- Mass of incoming particle taken into account in calculation of kinematic quantities

Questions ?