

GENIE status – resonance, DIS

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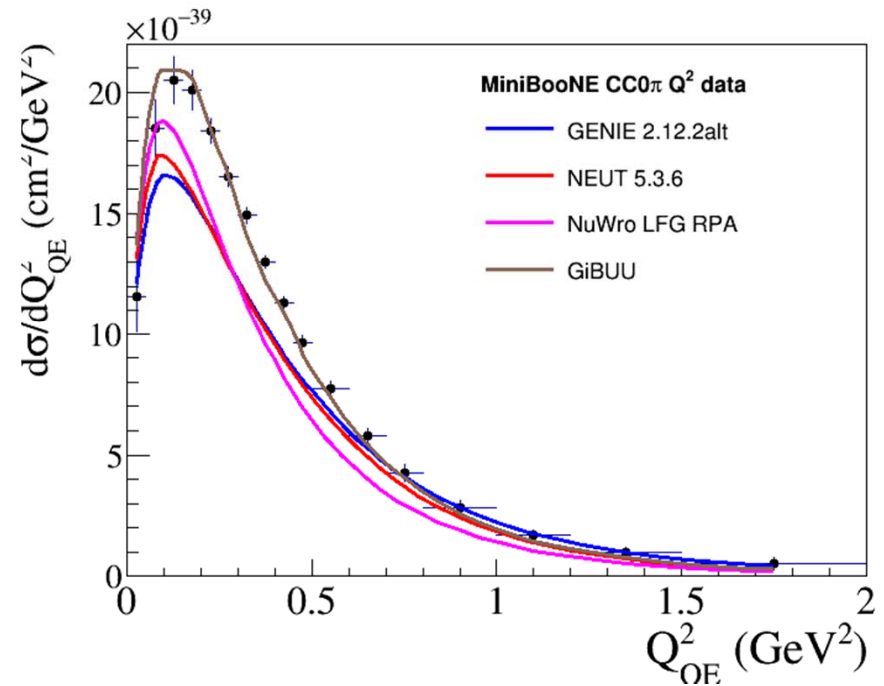
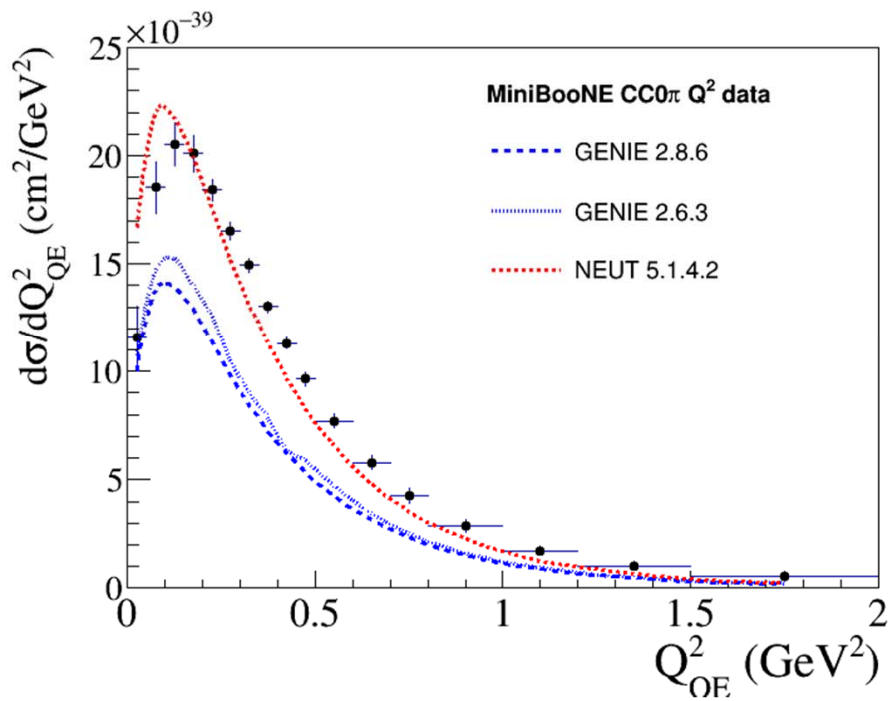
- resonance
- DIS
- FSI

Overview

- ▶ GENIE is important to many experiments
- ▶ Problems with GENIE physics can have broad consequences
 - ▶ Experiments have model dependences hard to quantify
 - ▶ Hard to keep up with theory with existing resources
- ▶ Despite influx of postdocs (4 at present, 2 in US), lack of manpower is still the biggest issue!

GENIE plans

- ▶ Big push on new models ending, but model development will still continue
- ▶ Largest effort right now is to collect best models into v3.0.0 – first new set of core models (Default + others)



Pion production - Rein-Sehgal

- ▶ I see it as a framework + optional models
- ▶ Update resonance parameters from PDG summary
- ▶ Berger-Sehgal is now alternate model (lepton mass)
- ▶ Isotropic replaced by RS in default (Libo Jiang (Pitt))
- ▶ Switch to MAID Vector form factors almost done (Luis Alvarez-Ruso, Libo)
- ▶ Still FKR nonrel quark model used for axial form factors
 - ▶ under investigation (Libo)
- ▶ No medium effects
- ▶ Nonresonant remains scaled Bodek-Yang (res+nonres)
 - ▶ FNAL tried to hire Minoo who did thesis on
 - ▶ Valencia group offered chiral nonrel model

Final State Interactions (FSI)

- ▶ Default is schematic model (underappreciated)
 - ▶ Simple, Data-based
 - ▶ Easily changed
- ▶ v2.12.8 has 2 models – schematic, cascade model
 - ▶ Cascade model has nuclear medium effects for pion, nucleon (Tomek Golan, UR/FNAL)
- ▶ Significant effort to improve low energy GENIE nucleon FSI model half done (Pitt undergraduates)
- ▶ GEANT4 model nearly complete (Dennis Wright, SLAC)
- ▶ INCL model nearly complete (Marc Vololoniaina, Antananarivo)
- ▶ GiBUU model work underway (Navalona Ramanantoanina, Antananarivo)

DIS - Hugh is the expert (not me)

- ▶ Bodek-Yang (2015?) + AGKY + Pythia
 - ▶ Minimal nuclear effects
- ▶ Hadronization uses simple Baranov (SKAT) model
- ▶ Fixed errors at various times
- ▶ PYTHIA8 switch underway (Teppei Katori, Shivesh (PD))
 - ▶ Aim to have a short term solution soon
 - ▶ Needs significant structural changes for long term solution
- ▶ Large region of interest with small effort in recent years
- ▶ Kulagin/Pecci expressed interest in getting their model installed