

Extraction of the Resonance Electrocouplings from CLAS/CLAS12 Data

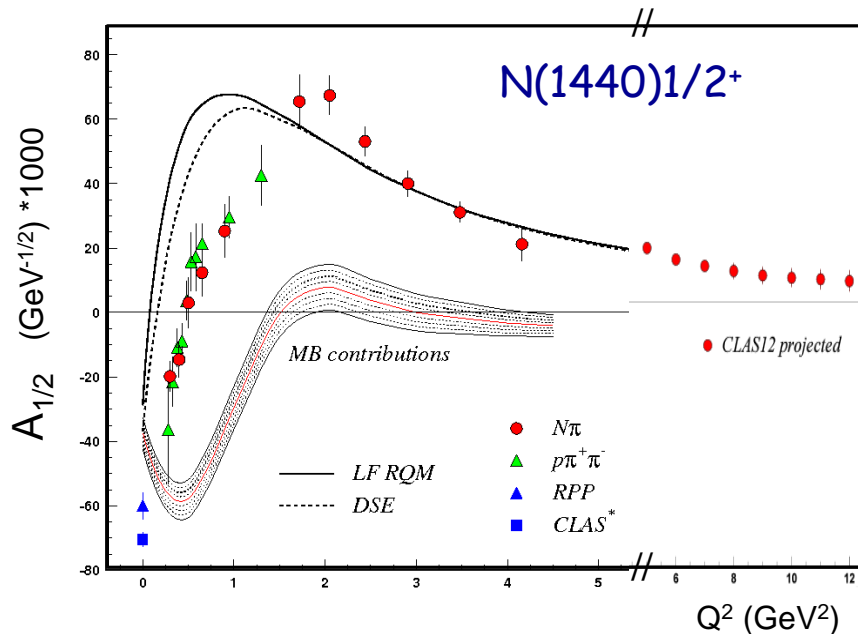
Determine $\gamma_{\nu}pN^*$ electrocouplings of all prominent resonances at $W < 3.0$ GeV from $N\pi$, $N\eta$, $N\pi\pi$, KY exclusive electroproduction off protons data with the CLAS12 at highest photon virtualities ever achieved of $Q^2 < 12$ GeV²

N^* electroexcitation studies at JLab will address the critical open questions:

How is >98% of visible mass generated?

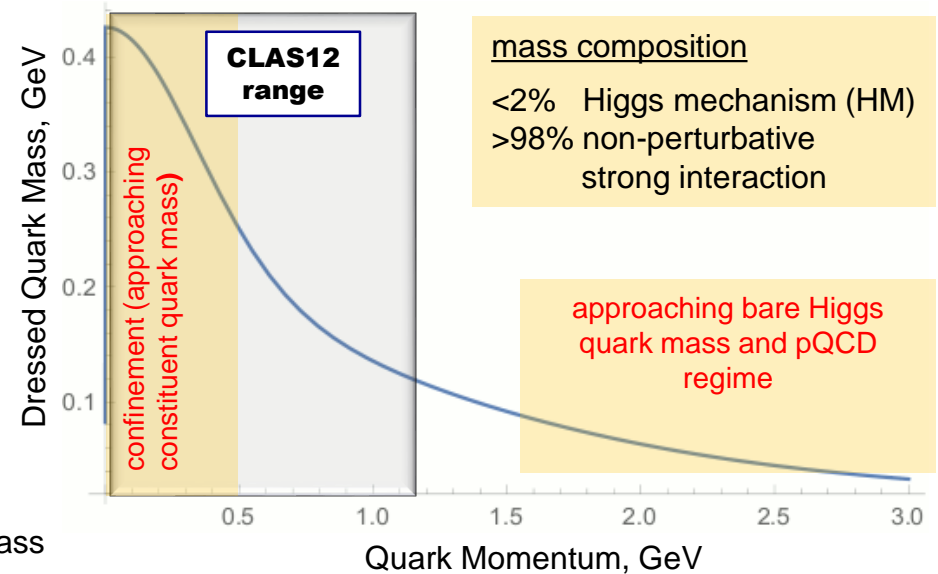
How does confinement emerge from QCD and how is it related to Dynamical Chiral Symmetry Breaking?

Mapping-out quark mass function from the CLAS12 results on $\gamma_{\nu}pN^*$ electrocouplings of spin-isospin flip, radial, and orbital excited resonances at $5 < Q^2 < 12$ GeV² will allow us to explore the transition from strong QCD to pQCD regimes.



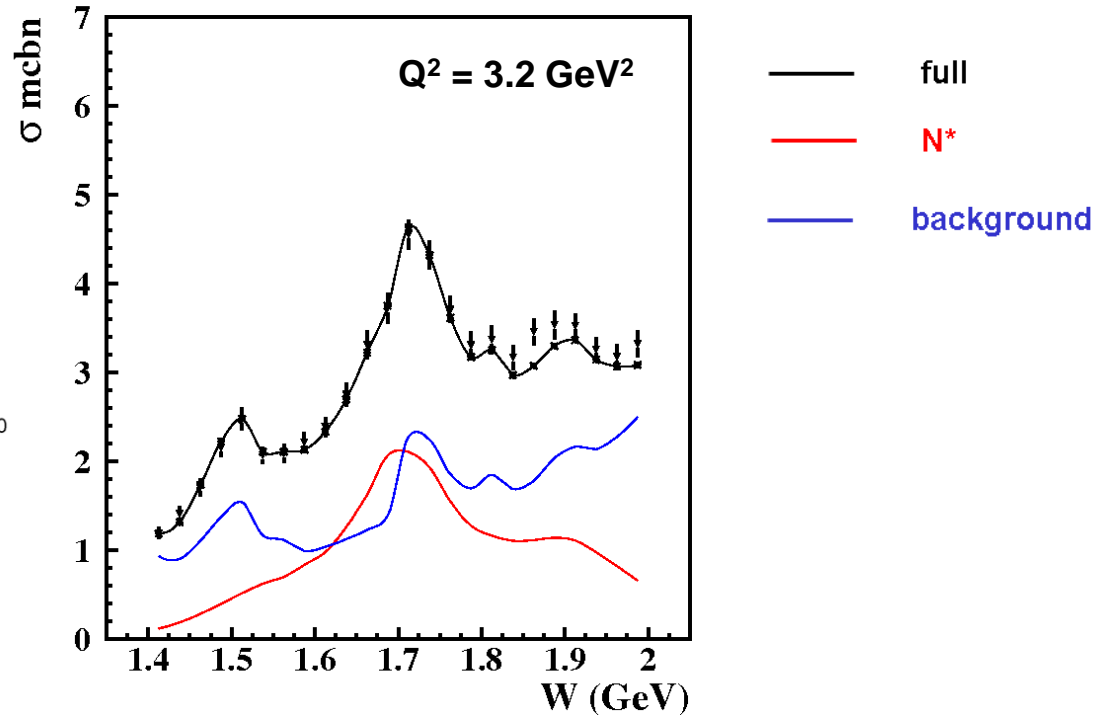
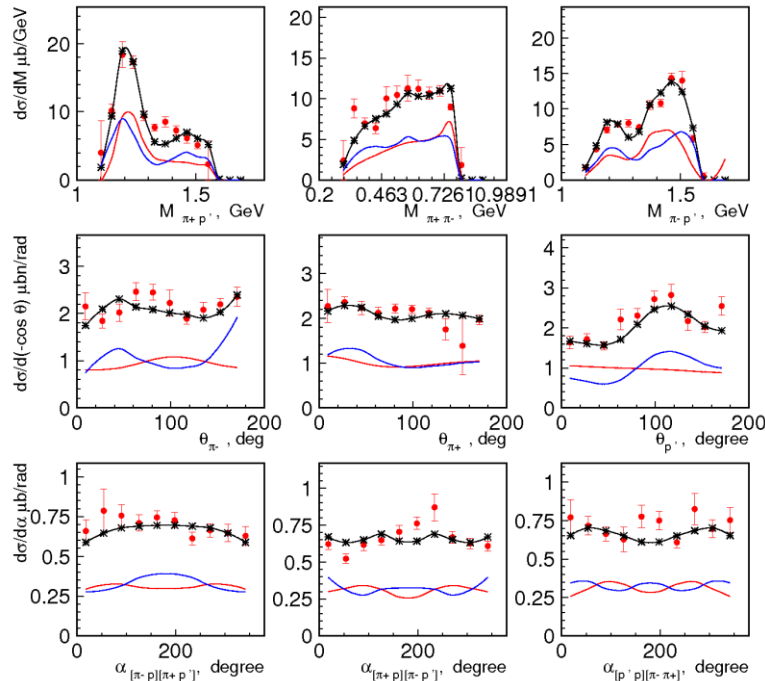
CLAS results versus theory expectations with running quark mass

Access to the dressed quark/hadron mass generation



Extension of the JM Reaction Model for the Extraction of $\gamma_V p N^*$ Electrocouplings at High Q^2

$W=1.74 \text{ GeV}, Q^2=3.2 \text{ GeV}^2$



- **Good description of nine one-fold differential $\pi^+\pi^-p$ electroproduction off protons cross sections was achieved within the updated JM model at $W < 2.0 \text{ GeV}$ and $2.0 \text{ GeV}^2 < Q^2 < 5.0 \text{ GeV}^2$.**
- **Substantial resonant contributions and their different kinematic dependencies in comparison with non-resonant processes will allow us to determine electrocouplings of all prominent nucleon resonances in the mass range up to 2.0 GeV**
- **Successful description of the CLAS data and increase of the relative resonant contributions with Q^2 strongly suggest the good prospects for extraction of $\gamma_V p N^*$ electrocouplings at $Q^2 > 5.0 \text{ GeV}^2$ within the further developed JM model.**