Perceiving the Emergence of Hadron Mass through

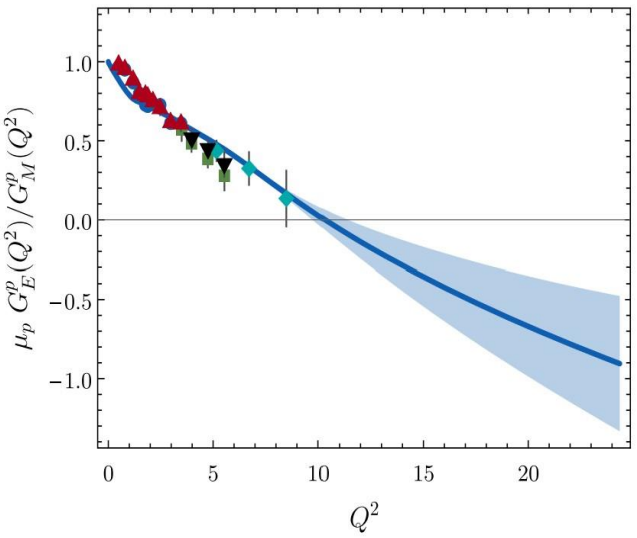
AMBER@CERN

30 November to 4 December 2020
CERN, Geneve - Switzerland

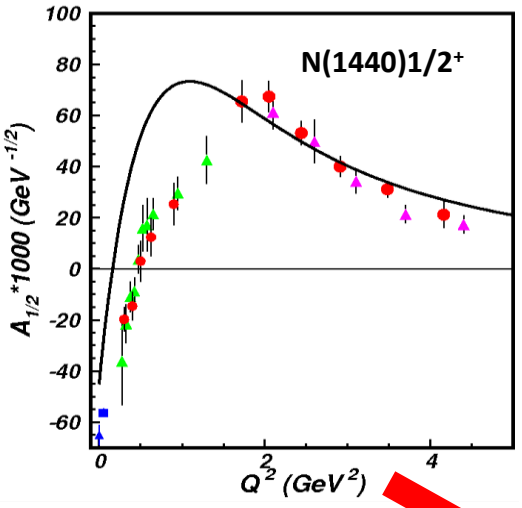
Discussion for the Session #4

EHM from the Global Hadron Structure Analysis

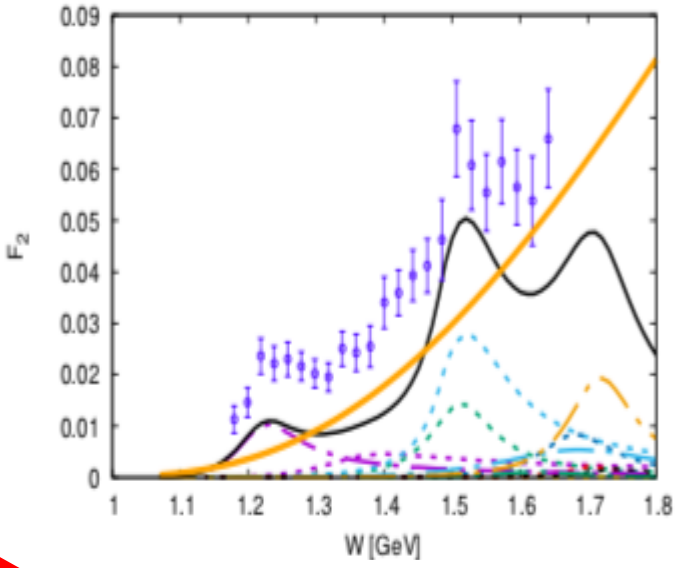
Nucleon Elastic FF



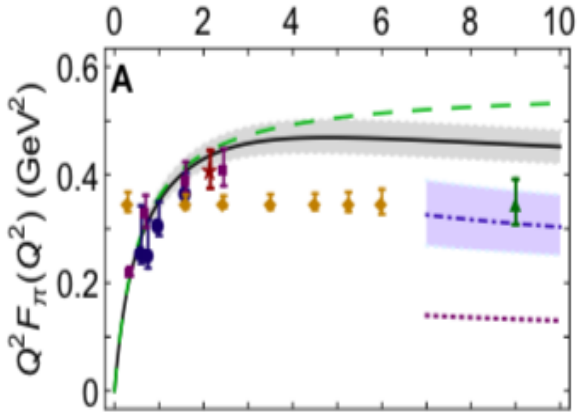
γ_vpN* Electrocouplings



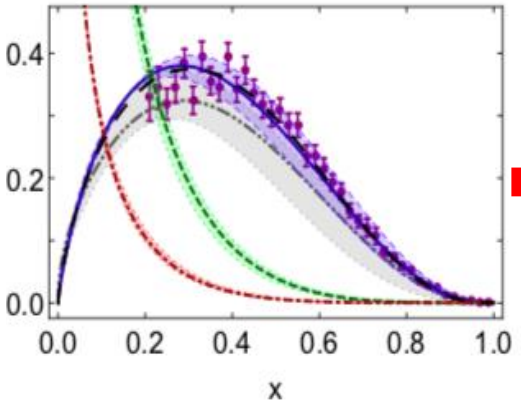
(e,e'X) Inclusive Scattering



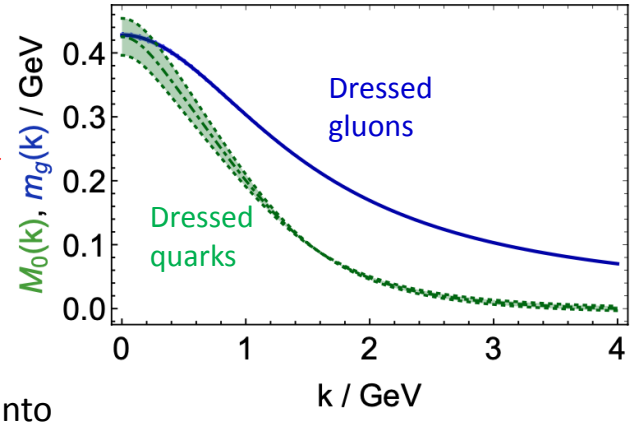
Pion Elastic FF



Pion PDF



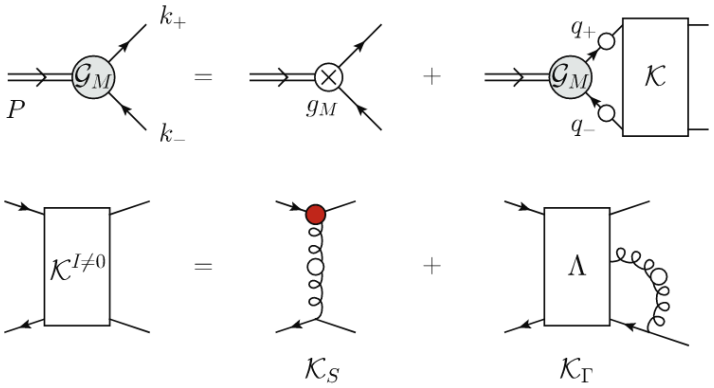
Dressed Quark/Gluon Running Masses



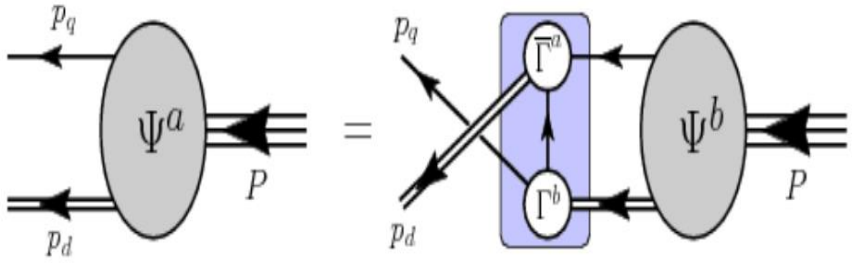
Continuum QCD approach has demonstrated the capability of gaining insight into the dressed quark/gluon running masses from all of the experimental results above!

qq- Correlation and Meson Bethe-Salpeter Amplitudes

Meson BS amplitudes



Faddeev N/N* amplitudes with di-quark correlations



Existence of mesons implies qq-correlation of the same J^p quantum numbers

- Can meson BS amplitudes be related to the qq-correlation amplitudes in Faddeev kernel for different spin/parity/isospin quantum numbers?

- The prospect to employ the information on meson BS amplitudes for evaluation of the nucleon elastic/transition form factors, ground nucleon PDFs and TMDs?

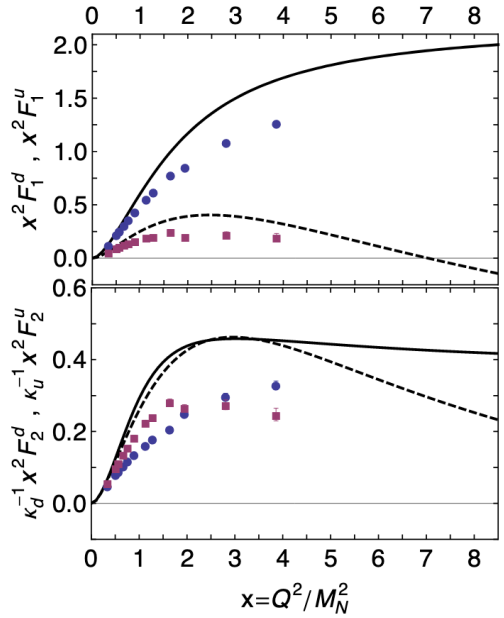
- The prospects of using the information on qq-correlation amplitudes from the studies of the nucleon elastic ff and $\gamma_v pN^*$ electrocouplings in order to constraint/predict meson BS-amplitudes and their e.m. form factors and PDFs.

qq- Correlations from the Studies of the Ground/Excited Nucleon Structure including TMD Femto-imaging

Under scalar di-quark dominance:

$F^d \sim F^u/Q^2$

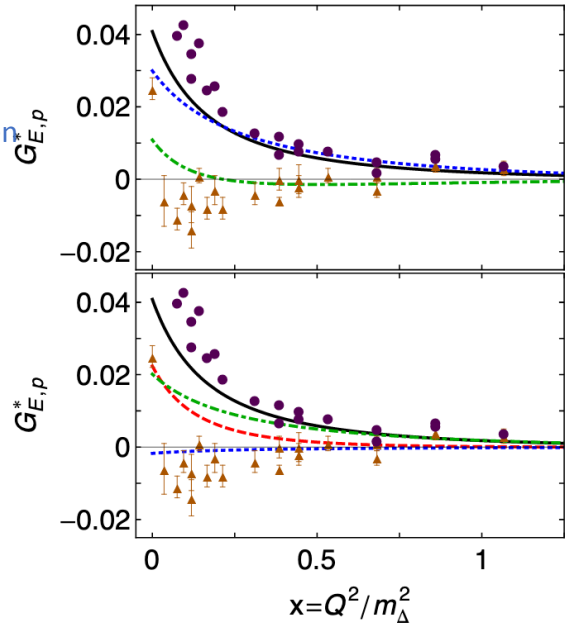
Ground state of the nucleons



transition between 0^+->1^+ di-quarks

overall di-quark contribution

p→Δ(1232)3/2⁺



- Prospects for extension of the information on di-quark correlations with J^p other than 0^+,1^+ from the results on $\gamma_v pN^*$ electrocouplings of the resonances with orbital quark-di-quark excitation of L=1,2?
- Impact of di-quark correlations on the ground nucleon PDF, TMD, shape of the nucleon.
- Whether di-quarks be radially excited? Would it be possible to address this question in exploration of the N(1710)1/2+ electrocouplings?
- Would it be possible to constraint the energy-momentum tensor from TMD?
- lQCD/Continuum QCD synergy in the TMD analyses.