Morning

Hadron Spectroscopy 1

Remote connection: https://bluejeans.com/465074976

Convener: Marco Battaglieri (INFN-GE)

Location: CEBAF Center (L102)

08:30 **Hadron Spectroscopy Working Group Business** *20'*
Speaker: Dr. Marco Battaglieri (INFN-GE)

08:50 **JPAC activity update** *20'*
Speaker: Dr. Alessandro Pilloni (JLab)

09:10 **Longitudinal analysis for dimeson photoproduction** *20'*
Speaker: Dr. Derek Glazier (University of Edinburgh)
Material: **Slides**

09:30 **update on the omega->pi0e+e- analysis** *20'*
Speaker: Susan Schadmand (Forschungszentrum Juelich)

09:50 **Investigation of the CLAS g12 kinematic fitter** *20'*
Speaker: Dr. Daniel Lersch (Juliech)

10:10 **Status of the analysis of eta->pi+pi-pi0 with the CLAS g12 data set** *20'*
Speaker: Dr. Daniel Lersch (Juliech)

10:30 **Coffee Break** *20'*

10:50 **Radiative eta' decay** *20'*
Speaker: Mr. MBIANDA NJENCHEU Georgie (ODU)

11:10 **Dalitz Plot analysis of etap--->eta p+ pi-** *20'*
Speaker: Dr. Sudeep Ghosh (IIT (India))

11:30 **Beam helicity asymmetries for dipion and dikaon photoproduction** *20'*
Speaker: Mr. Rafael Badui (FIU)

11:50 **Exclusive pi- Electroproduction off the Neutron in Deuterium in the Resonance Region** *20'*
Speaker: Dr. Ye Tian (University of South Carolina)
Material: **Slides**

12:10 **Analysis review status** *20'*

12:30 **Lunch** *1h0'*

HSWG

CLAS Collaboration Meeting
JLab, June 17 2016

Afternoon:
PAC sessions

Agenda

- ✳ Discussion about on-going / new-analysis
- ✳ PAC sessions (joint with other WG)

Activities

- ✳ Regular report at HSWG on JPAC activity to strengthen exp/the connection
- ✳ JPAC review in May: plenary talk at the next Collaboration meeting
- ✳ Analysis ready for a plenary presentation?
- ✳Chairmanship renewal

Igors's talk

Talks

- ✳ Over all CLAS contributions, HSWG-related are 33%
- ✳ We missed a couple of opportunities: why?
- ✳ Define a WG procedure to promote talks (especially for young HSWG researches) and promote mature analysis
- ✳REMINDER: Communicate talks and proceedings to the CSC
- ✳ JSA-TFC funds $20k allocated for 2016

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HSWG

CLAS Collaboration Meeting
JLab, June 17 2016

Afternoon:
PAC sessions

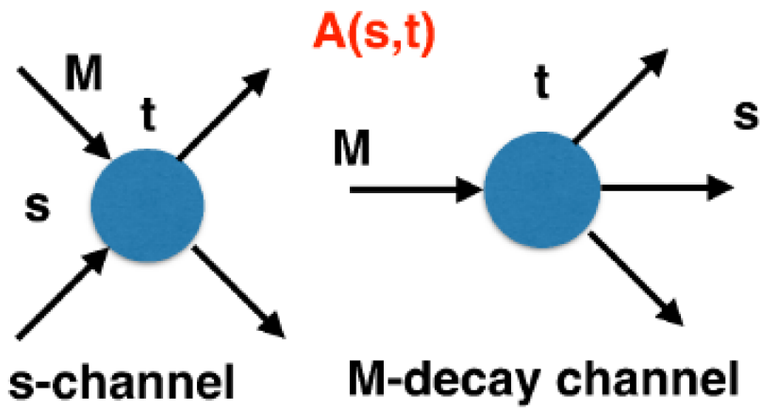
An update on JPAC activity

Alessandro Pilloni
Joint Physics Analysis Center

Data → Amplitude analysis (JPAC) → Spectrum and properties

Interpretations on the spectrum leads to understanding fundamental laws of nature

S-Matrix principles

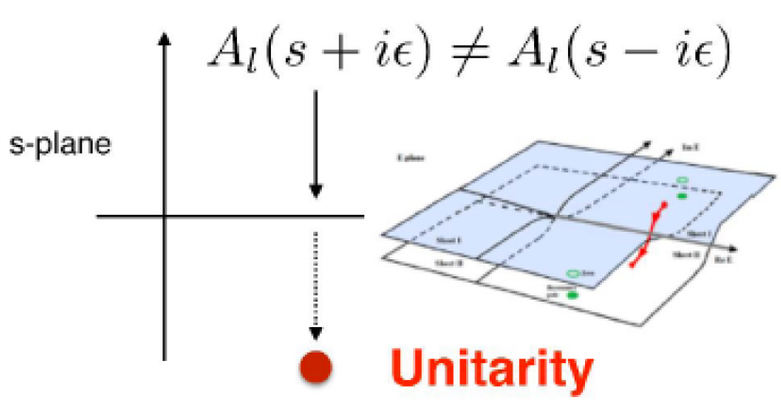


Crossing

$$A(s,t) = \sum_l A_l(s) P_l(z_s)$$

Analyticity

$$A_l(s) = \lim_{\epsilon \to 0} A_l(s + i\epsilon)$$

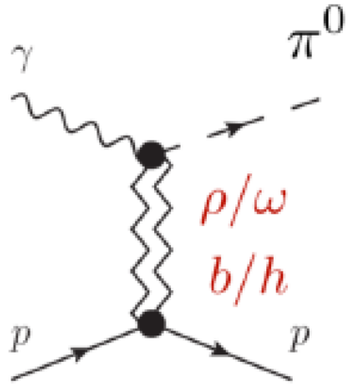


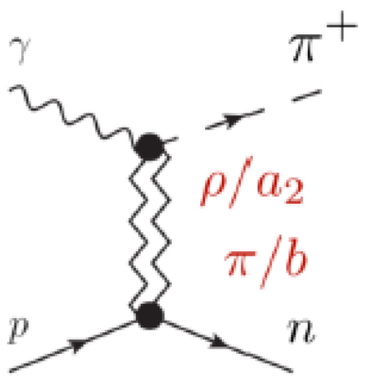
Unitarity

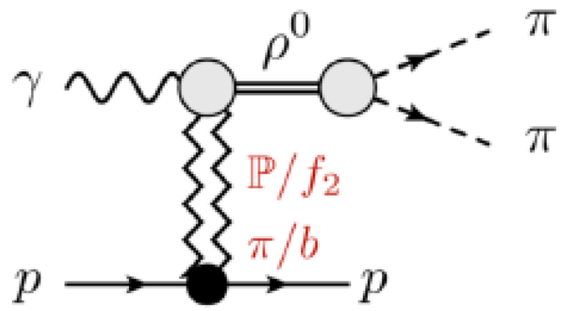
These are constraints the amplitudes have to satisfy, but do not fix the dynamics

Resonances (QCD states) are poles in the unphysical Riemann sheets

At high energies, other constraints from Regge theory (exchanges of towers of particles of any spin)







natural exchanges: $\rho/\omega/f_2/a_2/\mathbb{P}$ $\quad P = (-)^J$

unnatural exchanges: $\pi/b/h$ $\quad P = -(-)^J$

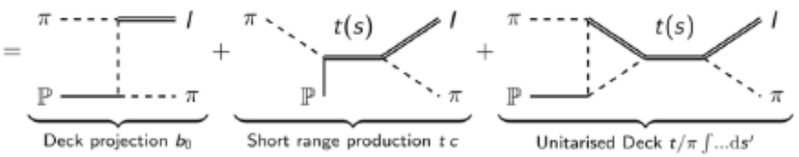
special ?

V. Mathieu

PWA of 3π svtem

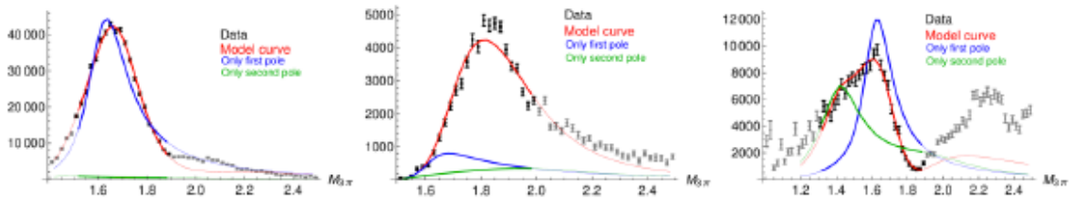
Now use unitarized Deck amplitude developed for this analysis

$$F_i(s) = b_i(s) + \sum_j t_{ij}(s) c_j + \frac{1}{\pi} \sum_j t_{ij}(s) \int_{s_j}^{\infty} ds' \frac{\rho_j(s') b_j(s')}{s' - s}$$

$F_i(s) =$ 

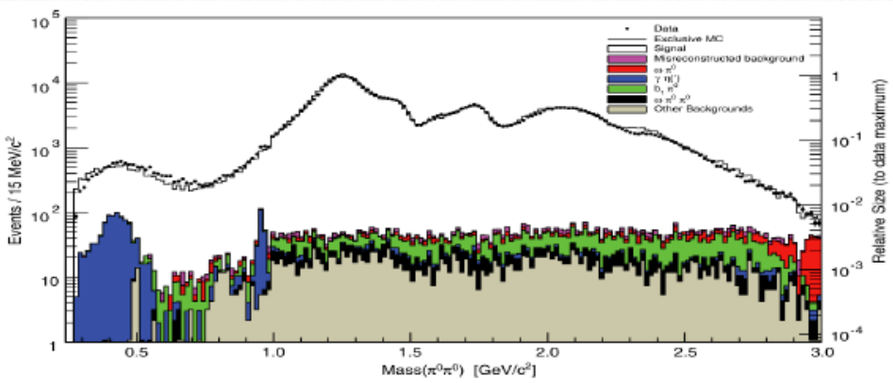
Data: three main waves at low $|t'|$ (0.1 GeV^2-0.113GeV^2):

$2^{-+}0^+ f_2\pi\, S, \qquad 2^{-+}0^+ f_2\pi\, D, \qquad 2^{-+}0^+ (\pi\pi)_s \pi D.$



$J/\psi \to \gamma\, \pi^0\pi^0$

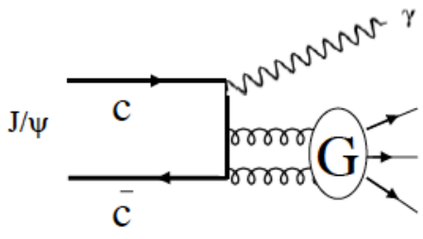
BESIII published in 2015 a partial wave analysis of $J/\psi \to \gamma\, \pi^0\pi^0$



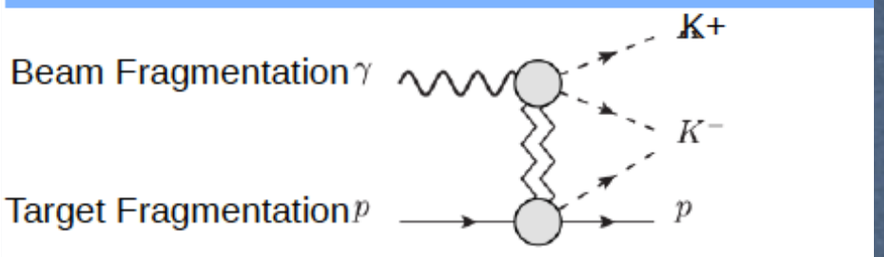
BESIII
PRD92, 052003

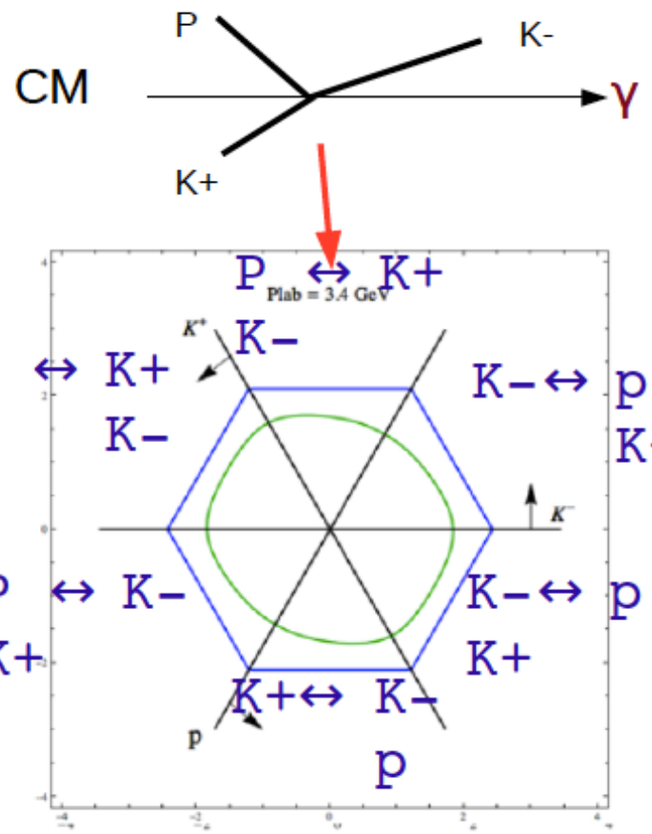
Bose symmetry and charge conjugation force the dipion to have $J^{PC}\, I^G = (\text{even})^{++}\, 0^+$

This is a gluon-rich process, expected to be one of the golden channels for the search of the scalar glueball



Van Hove Plots (Longitudinal)

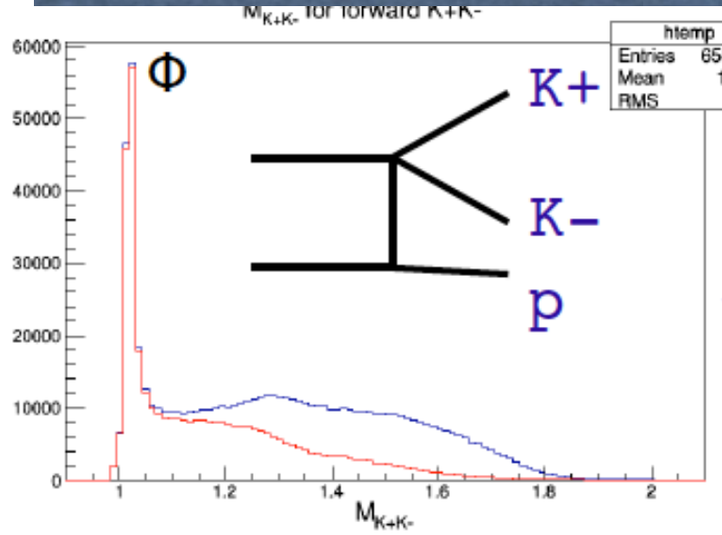


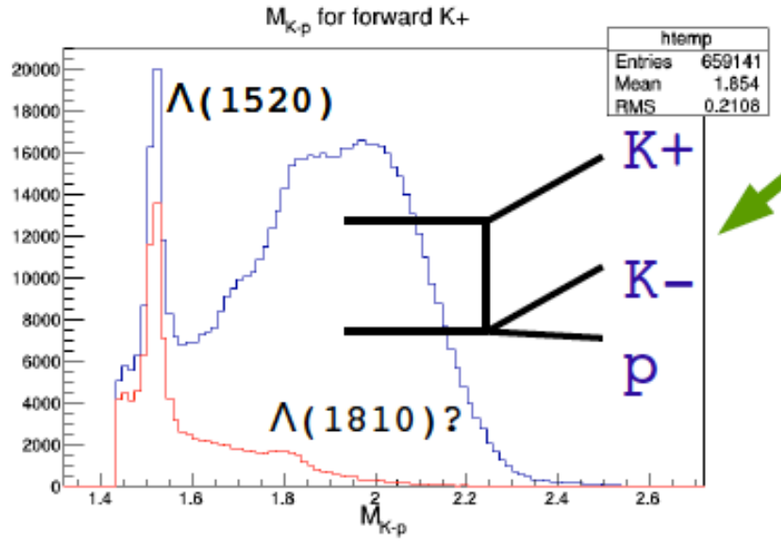


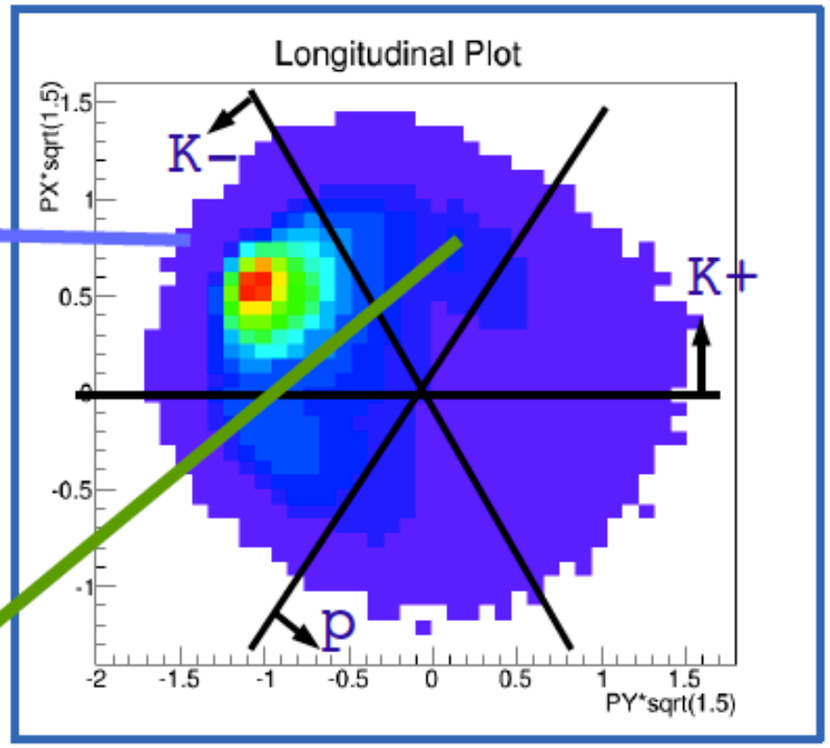
Longitudinal Phasespace Analysis

A technique to apply kinematic cuts
to enhance different reaction mechanisms

Derek Glazier
University of Glasgow





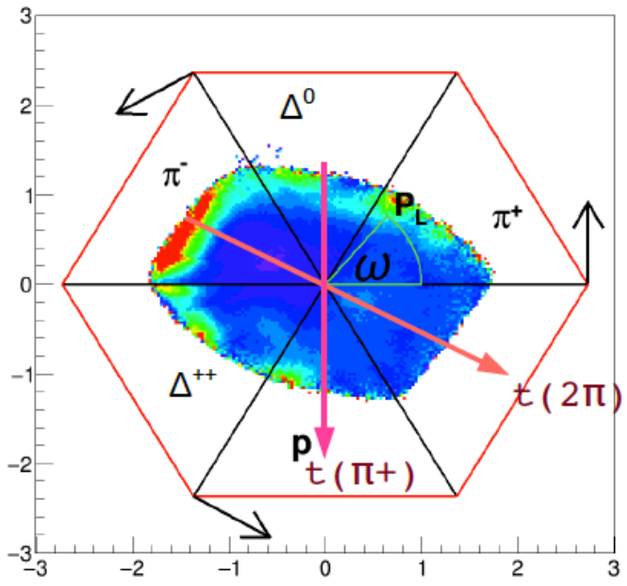


All Events

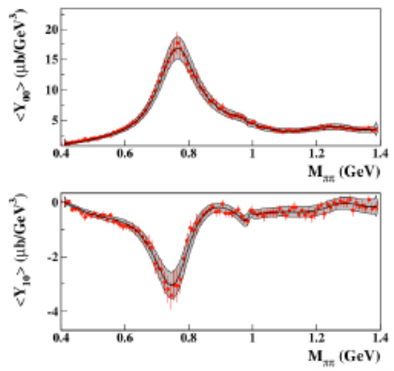
Cut on Longitudinal Plot sector

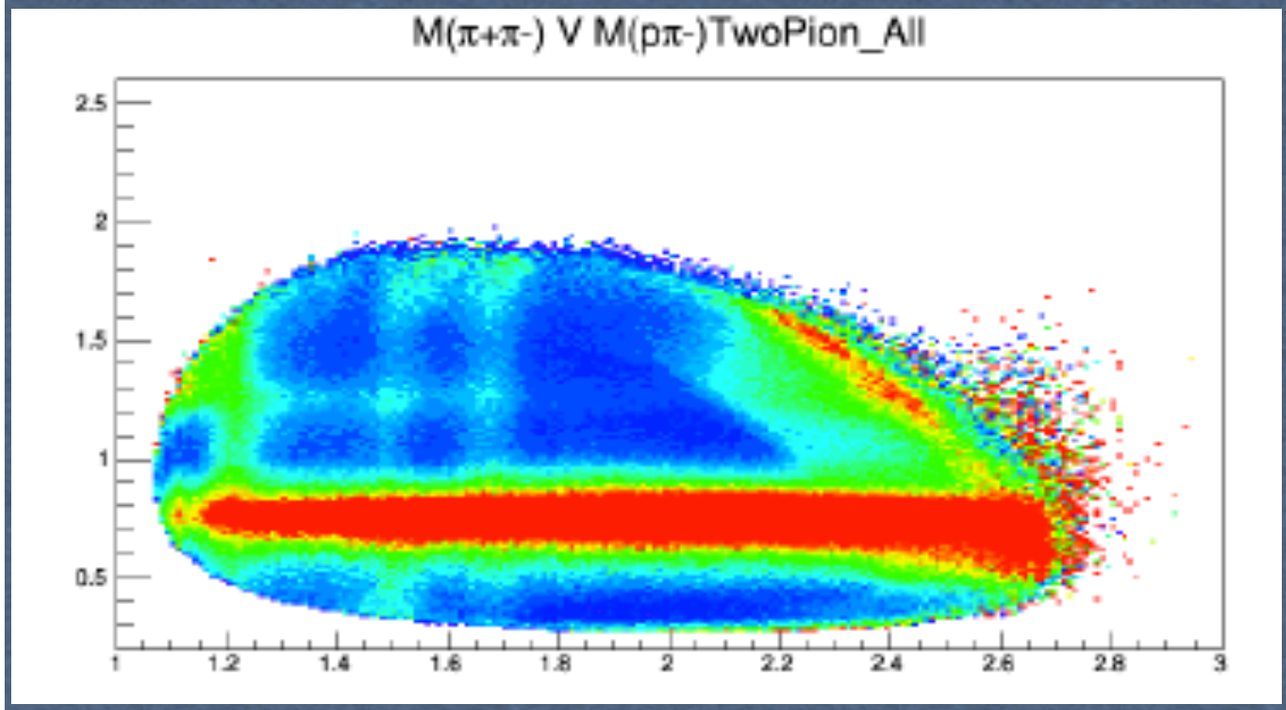
Longitudinal Plots π+π-p

van Hove Plot for $\gamma p \rightarrow \pi^+\pi^- p$

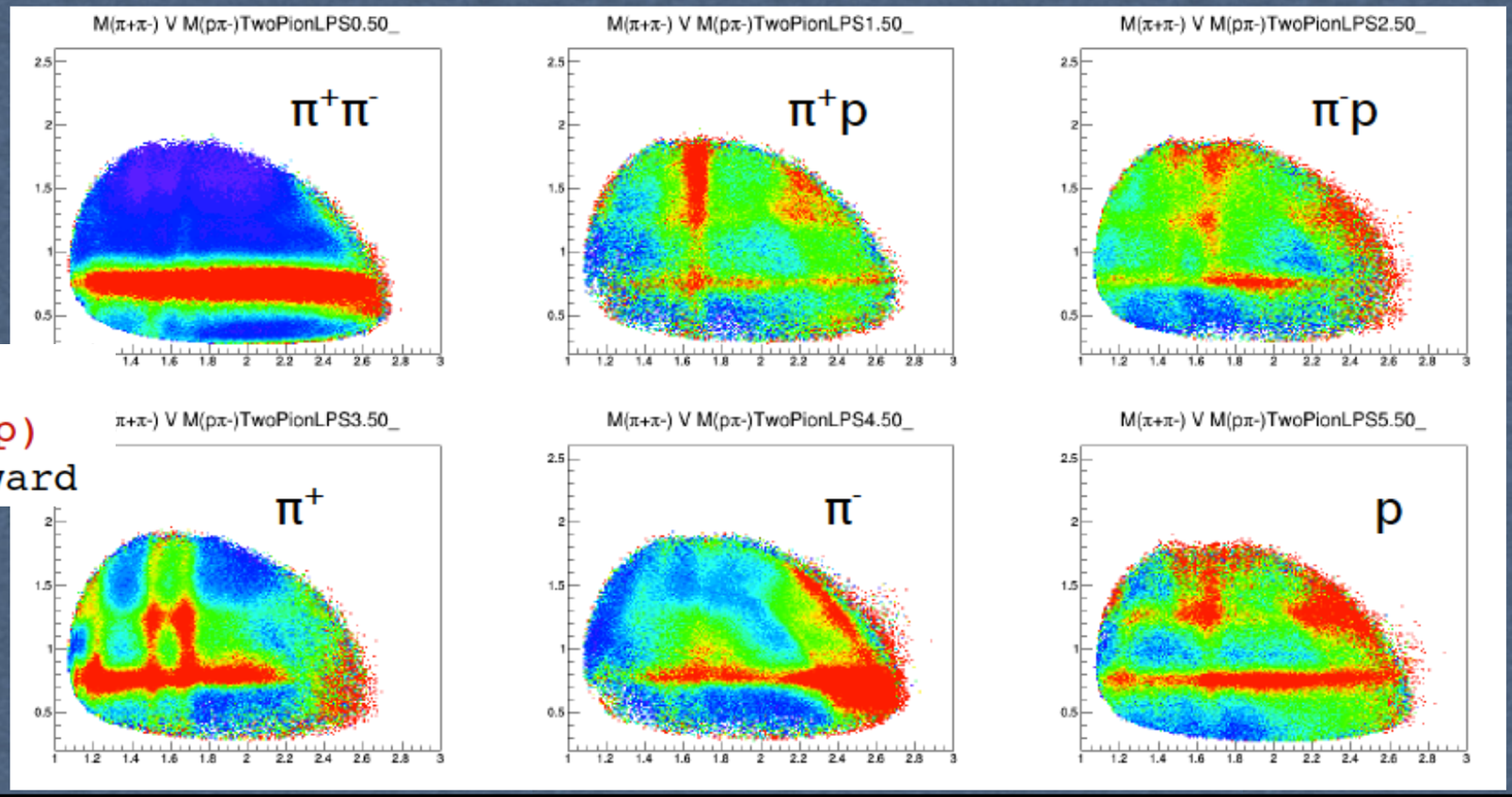


CLAS g11 dataset
Select all 4 topologies for π+π-p final state
These results are Background subtracted and acceptance corrected





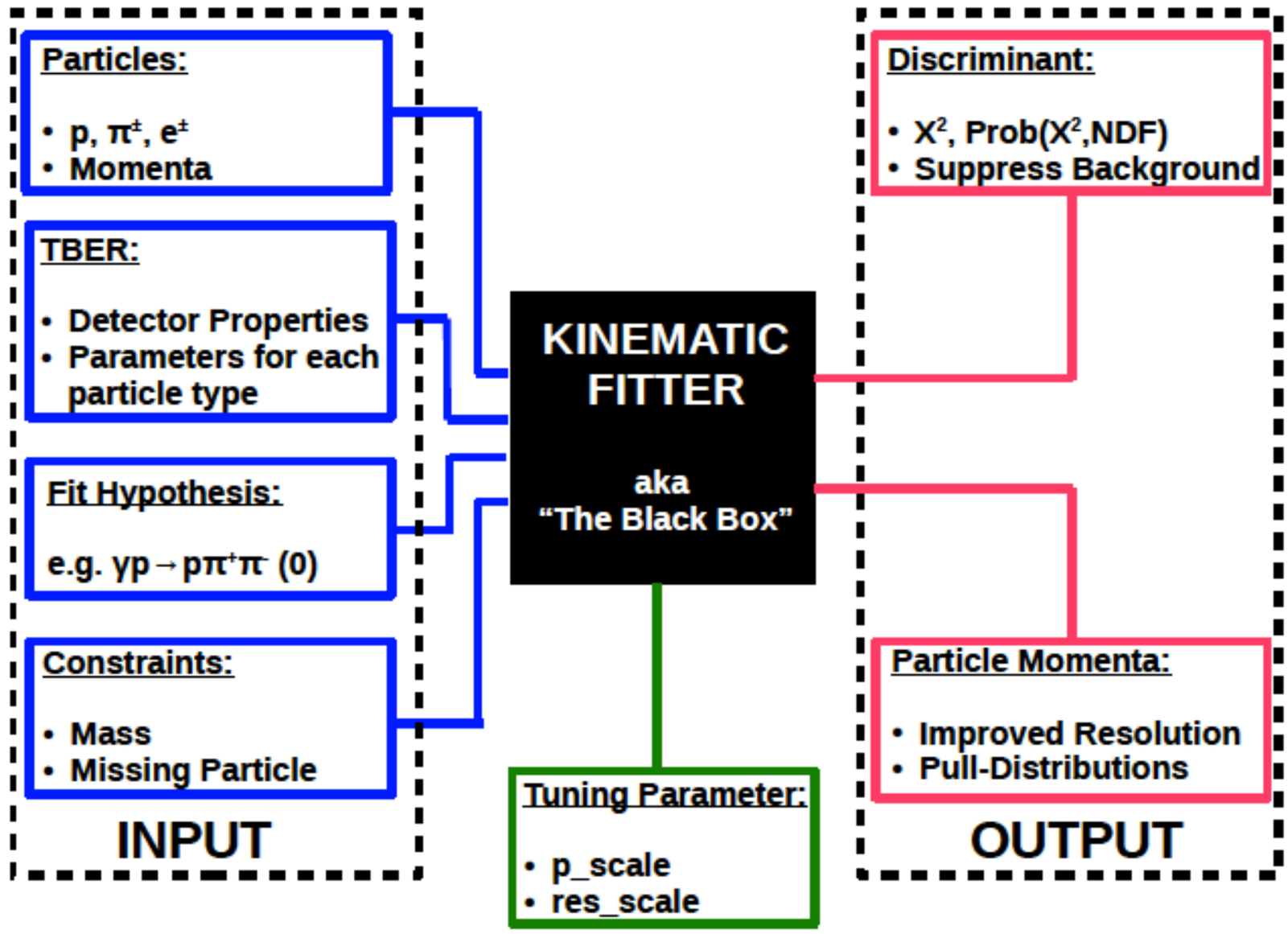
Split into LP Sector
Baryon/Meson Masses : M($\pi^+\pi^-$) v M(π^-p)
Named particles are travelling forward



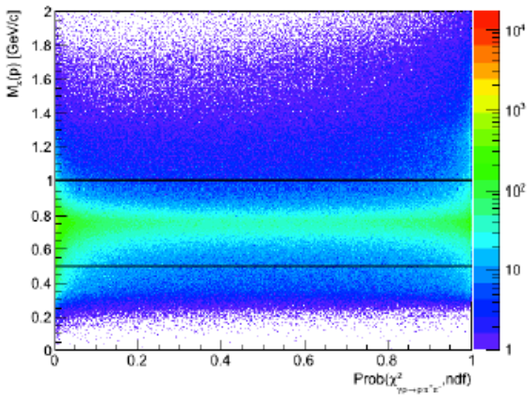
Investigation of the CLAS g12 Kinematic Fitter

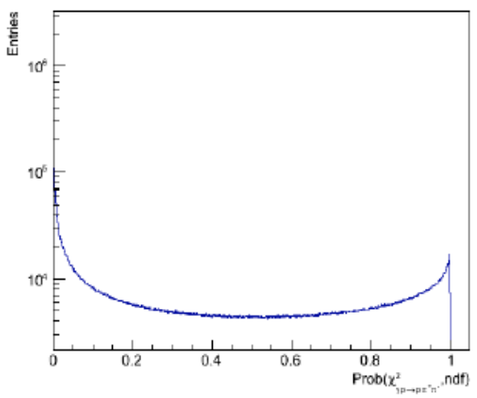
Daniel Lersch

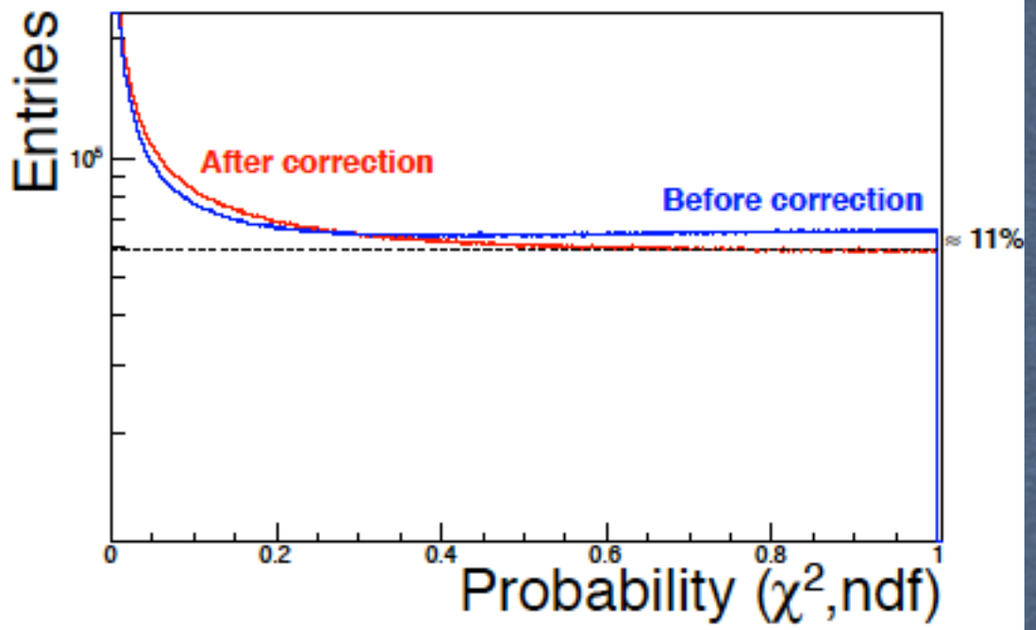
Kinematic Fit: Basics



Reconstruction of $\gamma p \to p\pi^+\pi^-$: The Kinematic Fit Probability







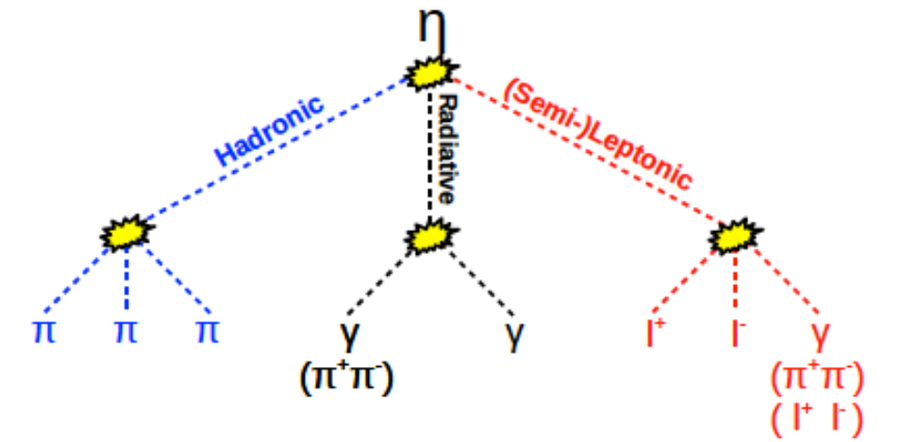
☑ Homework

- Tasks:
  - i) Investigate performance of the g12 kinematic fitter
    ⇒ Done via exclusive $\gamma p \to p\pi^+\pi^-$
  - ii) Tune fitter, if necessary, via adjusting p_scale and res_scale
    ⇒ Tuning was necessary and done via method presented on slide 8
- Questions related to task ii):
  - a) Will an adjustment/change of p_scale and res_scale affect the pull-distributions?
    ⇒ Yes, in the order of: $\Delta\sigma \lesssim 10\%$ and $\Delta\mu \lesssim 5\%$
  - b) Are run-wise or global corrections necessary?
    ⇒ Global corrections are sufficient
  - c) Does each reaction hypothesis require a different tuning?
    ⇒ Well, the new p_scale and res_scale values are suitable for all channels including protons and pions

One Meson, many Opportunities

- $m_\eta = 0.5478\,\mathrm{GeV}/c^2$
- $\Gamma_\eta = (1.31 \pm 0.05)\,\mathrm{keV}$
- $\bar{\tau} \approx 5 \cdot 10^{-19}\,\mathrm{s}$
- $J^{PC} = 0^{-+} \Longrightarrow \eta$-meson is: C-, P-, G- and CP- eigenstate
- All strong and electromagnetic decays are forbidden to first order

⇒ **Access to rare decay processes**

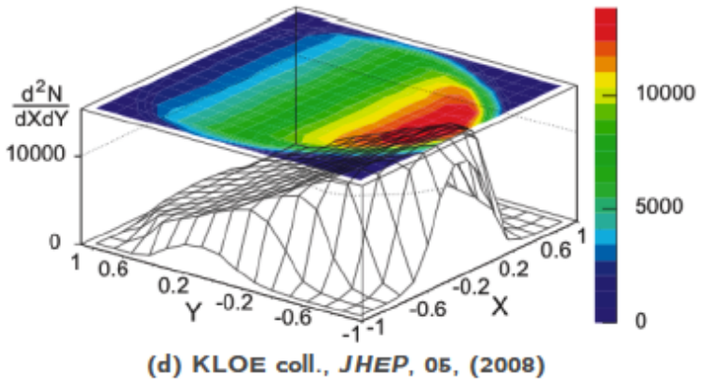


Decay mode	Issue
$\eta' \to \pi^+\pi^-\eta$	Dalitz plot analysis (See talk by S. Ghosh)
$\eta \to \pi^+\pi^-\pi^0$	Dalitz plot analysis
$\eta^{(\prime)} \to \pi^+\pi^-\gamma$	Box anomaly, $\pi^+\pi^-$ FSI (See talk by G. Mbianda Njenchu)
$\eta^{(\prime)} \to e^+e^-\gamma^*$	Single-off-shell transition form factor (See talk by M. C. Kunkel)
$\eta^{(\prime)} \to \pi^+\pi^-e^+e^-$	CP-Violation
$\eta \to e^+e^-e^+e^{-*}$	Double-off-shell transition form factor
$\eta \to \pi^0 e^+e^-$	C-Violation

Status of the Analysis of $\eta \to \pi^+\pi^-\pi^0$ with the CLAS g12 Data Set

Daniel Lersch

The Dalitz Plot



(d) KLOE coll., *JHEP*, 05, (2008)

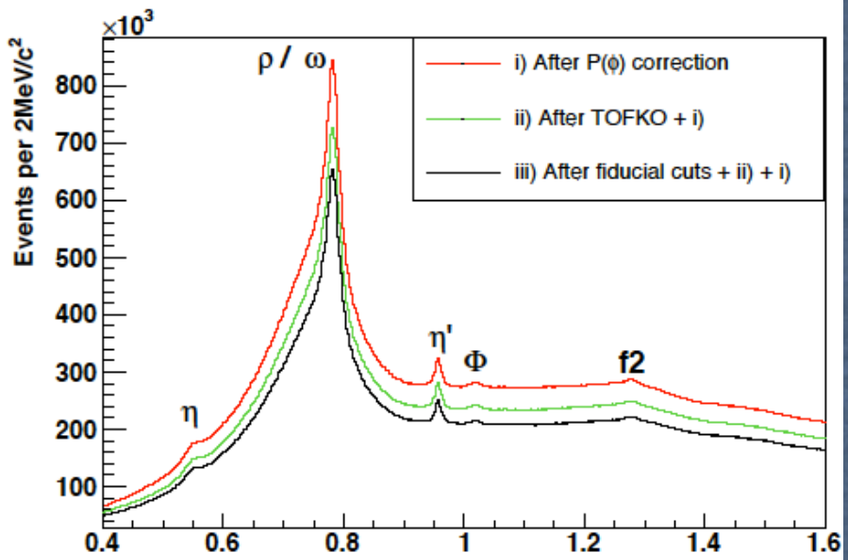
Dimensionless Dalitz plot variables:

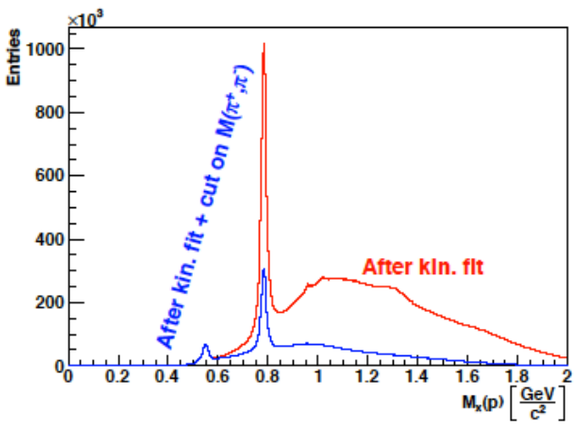
$$X = \sqrt{3}\frac{T_{\pi^+} - T_{\pi^-}}{T_{\pi^+} + T_{\pi^-} + T_{\pi^0}}$$

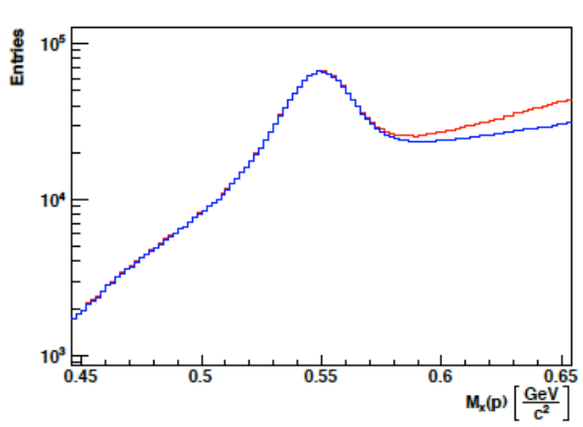
$$Y = \frac{3T_{\pi^0}}{T_{\pi^+} + T_{\pi^-} + T_{\pi^0}}$$

- Decay via strong isospin violation: $\Gamma_{meas} = \left(\frac{Q_D}{Q}\right)^4 \bar{\Gamma}$
  - $Q^2 = \frac{m_s^2 - \hat{m}^2}{m_d^2 - m_u^2}$, $\hat{m} = \frac{1}{2}(m_u + m_d)$
  - $\bar{\Gamma}$ calculated with ChPT at Dashen limit, $Q_D = 24.2$
- Dalitz plot analysis: $\frac{d^2\Gamma}{dXdY} \propto (1 + aY + bY^2 + dX^2 + fY^3 + gX^2Y + ...)$
  $\rightarrow$ *c*, *e* and *h* would imply C-violation

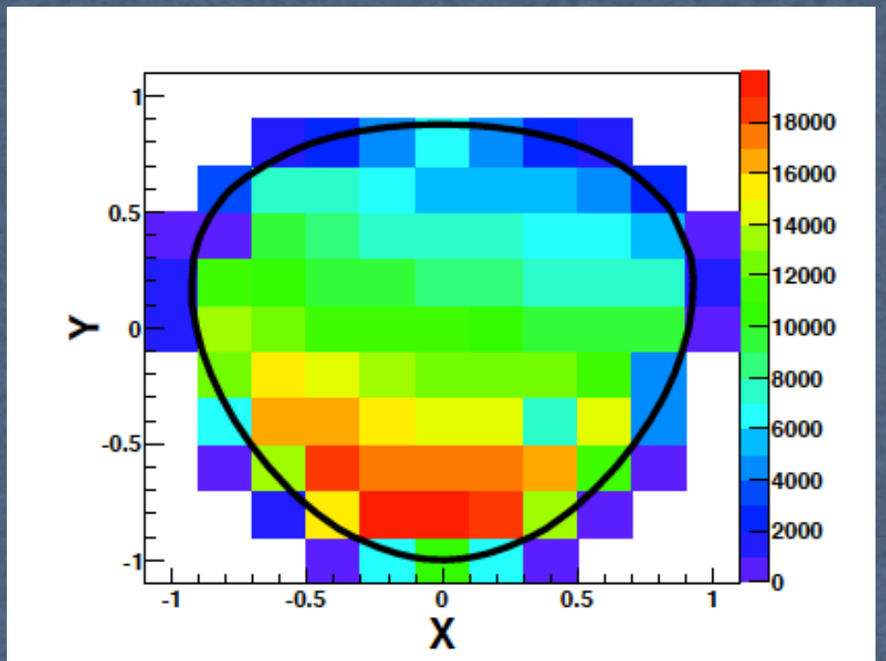
Analysis of $\eta \rightarrow \pi^+\pi^-\pi^0$: Basics







- In both plots: Red: Before applying the invariant mass cut / Blue: After applying the invariant mass cut



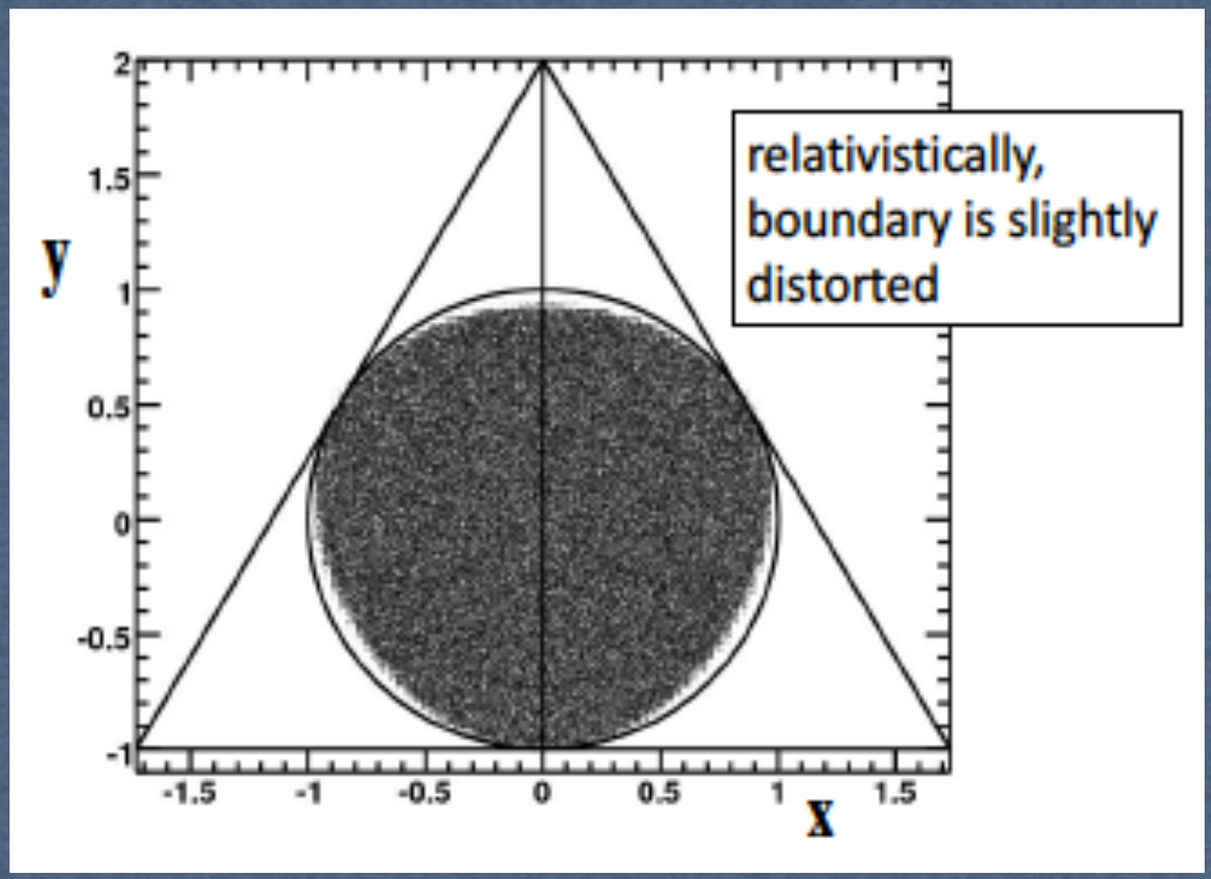
Dalitz Plot Analysis of $\eta' \to \eta\ \pi^+\ \pi^-$

Sudeep Ghosh for the CLAS Collaboration

Indian Institute of Technology Indore, India

- The Dalitz variables for $\eta'(P) \to \eta(p_1) + \pi^+(p_2) + \pi^-(p_3)$ is defined as

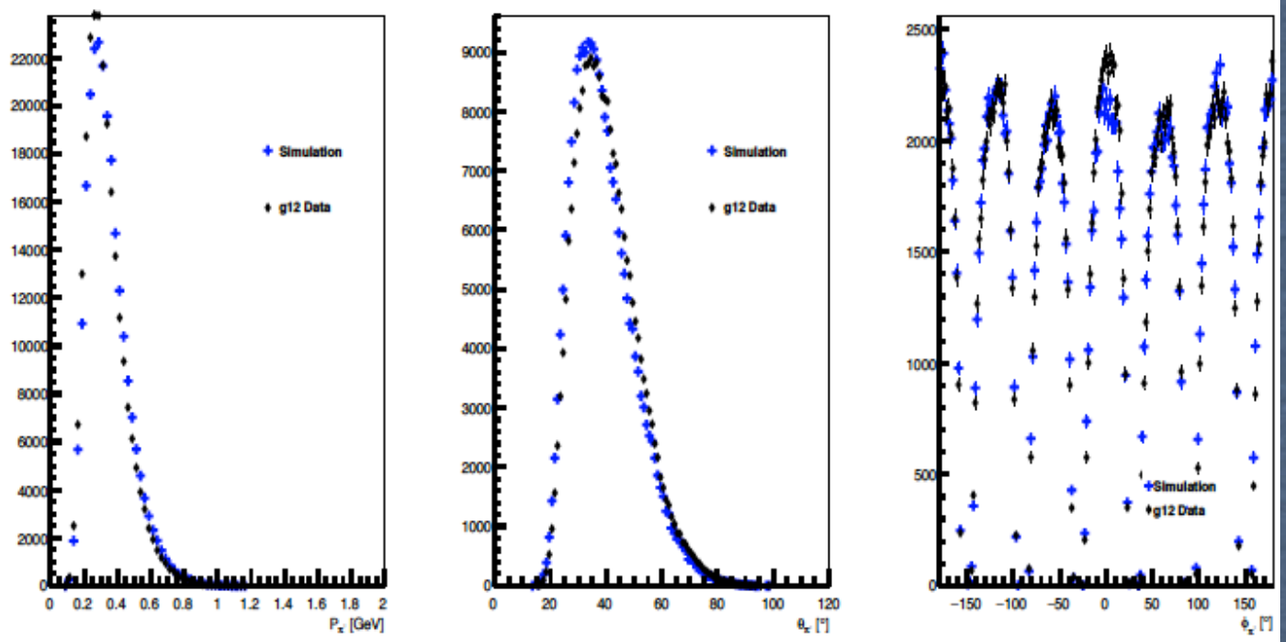
$$X = \frac{\sqrt{3}(T_{\pi^+} - T_{\pi^-})}{Q}, Y = \frac{(m_\eta + 2m_\pi)}{m_\pi} \cdot \frac{T_\eta}{Q} - 1, \qquad (1)$$



$$\frac{T_1 + T_2 + T_3}{Q} = 1$$

$$\rho(x, y) = \frac{1}{2J+1} \sum_{m_j} |A(m_j)|^2$$

Comparison of Momentum, θ and ϕ of π-

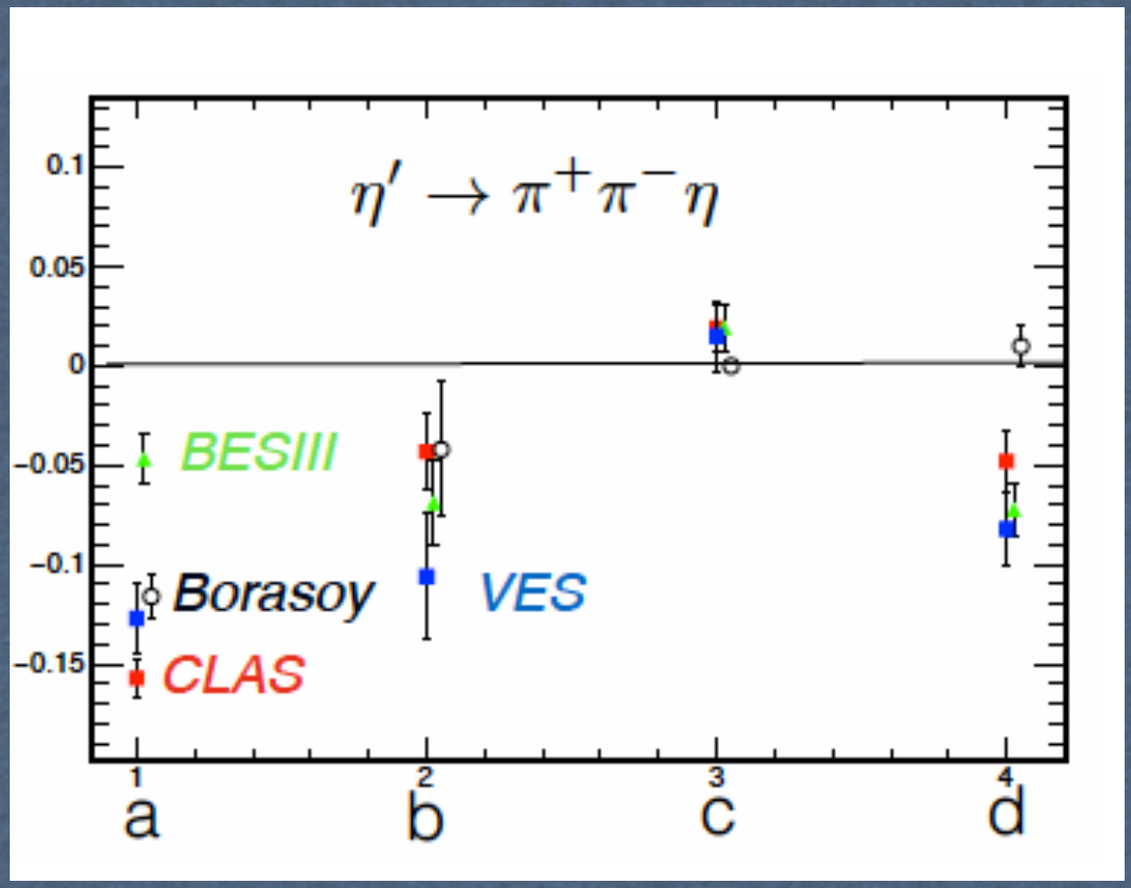


Parameter	Theory [1]	VES [2]	BESIII [3]	Present Work
a	-0.116 ± 0.011	-0.127 ± 0.018	-0.047 ± 0.012	-0.157 ± 0.010
b	-0.042 ± 0.034	-0.106 ± 0.032	-0.069 ± 0.021	-0.043 ± 0.019
c	...	0.015 ± 0.018	0.019 ± 0.012	0.019 ± 0.012
d	+0.010 ± 0.019	-0.082 ± 0.019	-0.073 ± 0.013	-0.048 ± 0.016
$\frac{\chi^2}{NDF}$		$\frac{129.3}{114} = 1.13$	$\frac{504}{476} = 1.05$	$\frac{291}{97} = 3$

Fit to the Dalitz Plot

$$\chi^2 = \sum_{n=1}^{Nbins} \left(\frac{N_n - \sum_{m=1}^{Nbins} \epsilon_{n,m} N_{theory,m}}{\sigma_n} \right) 2$$

- N_n is no. of $\eta' \to \eta\ \pi^+\ \pi^-$ events in the n^{th} DP bin.
- $\epsilon_{n,m}$ is acceptance with smearing matrix, ie. it gives acceptance of m^{th} bin when events are generated in n^{th} bin.
- $N_{theory,m} = \int_{Boundary} A(1 + aY + bY^2 + cX + dX^2) dX dY$
- σ_n is the error associated with n^{th} DP bin.



Radiative Decay of η' in CLAS

$$\gamma p \to p(\eta' \to \pi^+\pi^-\gamma)$$

Georgie Mbianda Njencheu

(LMD Group)

Old Dominion University

Axial Anomaly

- An anomaly arises when a classical symmetry is broken in QFT.
- The massless Dirac Lagrangian has a symmetry generated by the axial vector current

$$j_{5\mu} = \bar{\Psi}\gamma_\mu\gamma_5\Psi$$

- If Ψ satisfies $(i\gamma_\mu\partial^\mu - m)\Psi = 0$

$$\begin{aligned}\partial^\mu j_{5\mu} &= (\partial^\mu\bar{\Psi})\gamma_\mu\gamma_5\Psi - \bar{\Psi}\gamma_5\gamma_\mu\partial^\mu\Psi \\ &= (im\bar{\Psi})\gamma_5\Psi - \bar{\Psi}\gamma_5(-im\Psi) = 2im\bar{\Psi}\gamma_5\Psi \\ &= 0(m=0)\end{aligned}$$

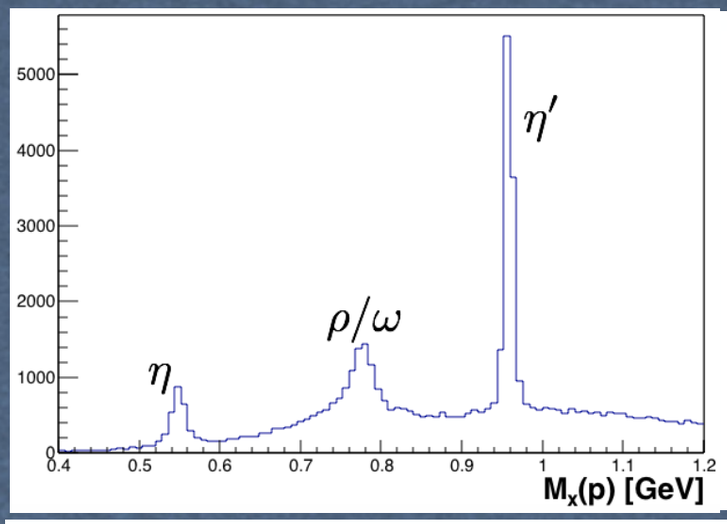
- However in QFT when gauge fields are present, the divergence of current is non-zero:

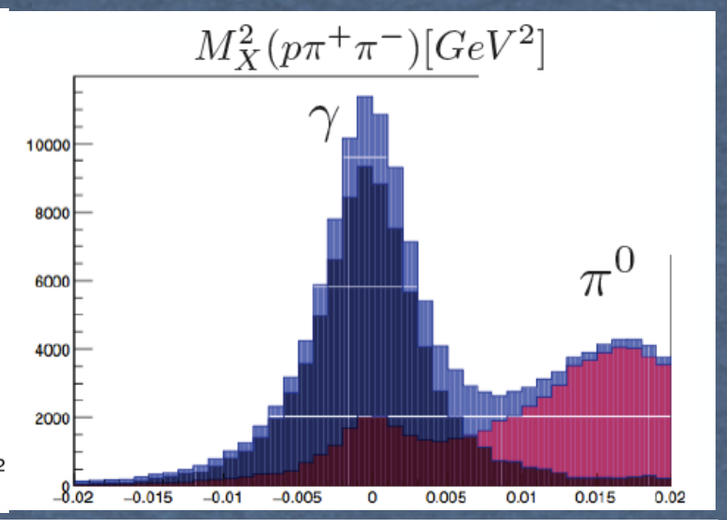
$$\partial^\mu j_{5\mu} = -\frac{e^2}{16\pi^2}\varepsilon^{\mu\nu\alpha\beta}F_{\mu\nu}F_{\alpha\beta}$$

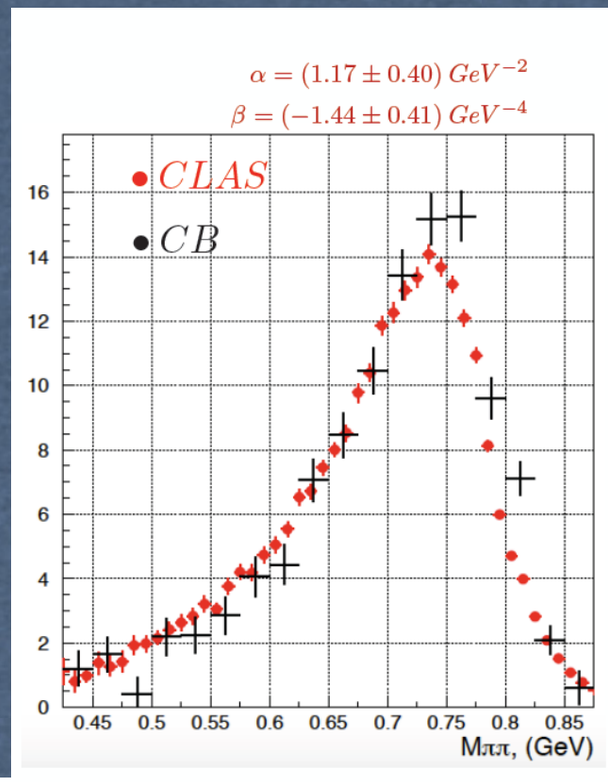
- where $F_{\mu\nu} = \partial_\mu A_\nu - \partial_\nu A_\mu$ is the EM field strength tensor.

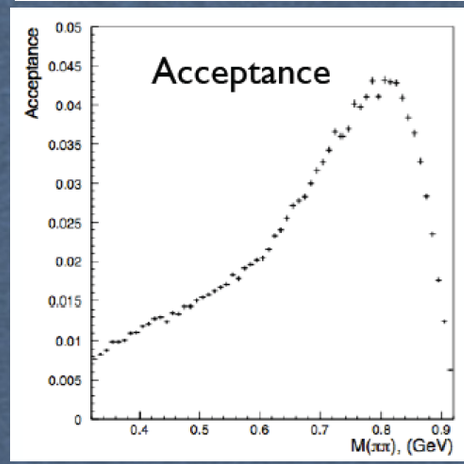
Meson Decay	Physics Interest	Meson Decay	Physics Interest
$\pi^0 \to e^+e^-\gamma$	Heavy photon upper limit	$\eta' \to \pi^+\pi^-\gamma$	Box anomaly
$\eta' \to e^+e^-\gamma$	Transition form factor	$\omega \to \pi^+\pi^-\gamma$	Upper limit branching ratio
$\omega \to e^+e^-\pi^0$	Transition form factor	$\eta, \omega, \phi \to \pi^+\pi^-\pi^0$	Dalitz plot analysis
$\eta' \to e^+e^-\pi^0$	C violation	$\eta' \to \pi^+\pi^-\eta$	Dalitz plot analysis
$\eta' \to e^+e^-\pi^+\pi^-$	CP violation	$\phi \to \pi^+\pi^-\eta$	G-parity violation

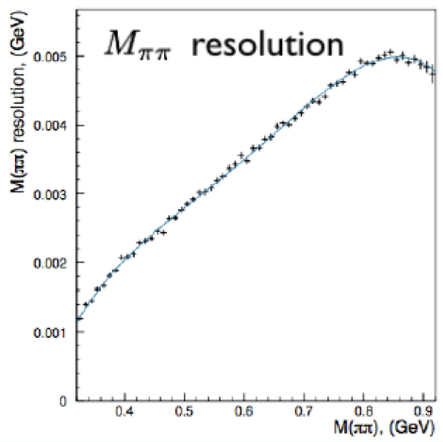
- The di-pion invariant mass for $\eta' \to \pi^+\pi^-\gamma$ could be described in a model-independent approach of a single free parameter, α

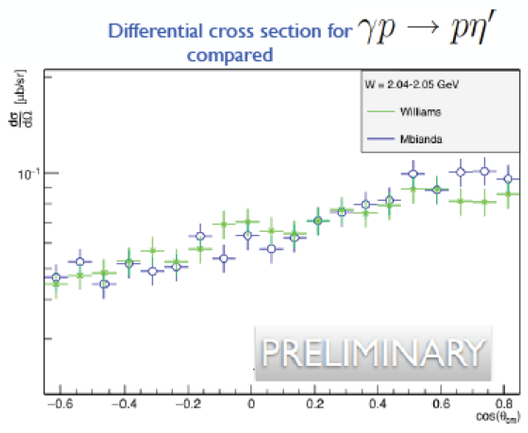




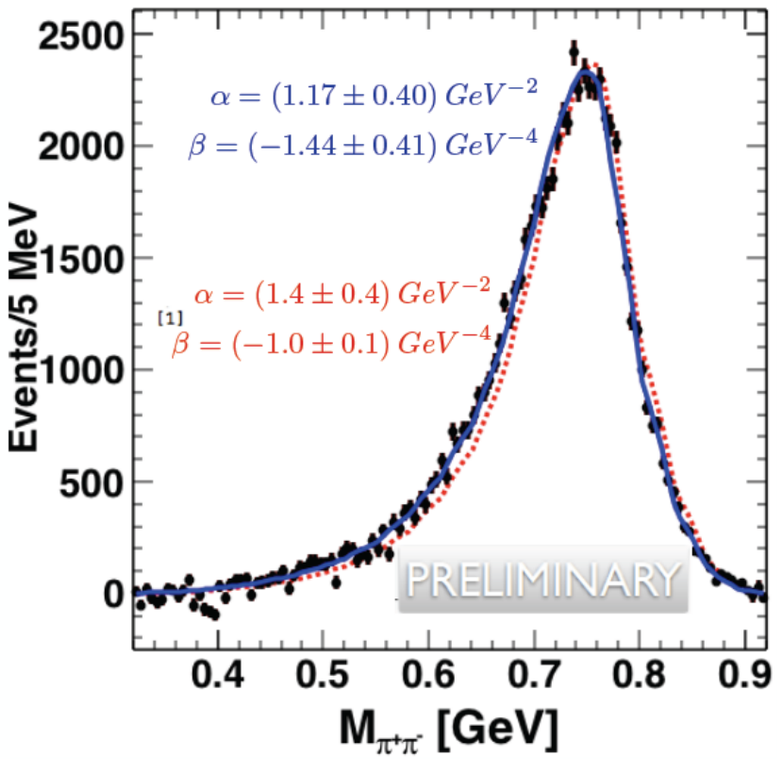








nparison with Theoretical Prediction from Kubis et al. (2015)



- The radiative decay matrix element can be written as:

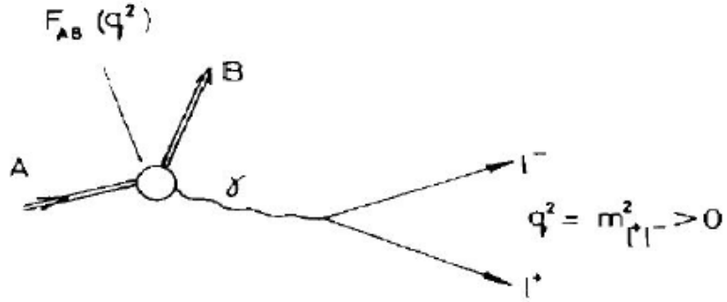
$$|M|^2 \approx |F_V(m_{\pi\pi}^2)|^2(1 + \alpha m_{\pi\pi}^2 + \beta m_{\pi\pi}^4)^2 E_\gamma^2 q^2 sin^2(\theta)$$

update on the $\omega \to \pi^0 e^+ e^-$ analysis

Susan Schadmand, IKP
hadron spectroscopy session
CLAS collaboration meeting
June, 2016, Jefferson Lab

transition form factor

JÜLICH FORSCHUNGSZENTRUM



$$\frac{d\Gamma(A \to B\, l^+ l^-)}{dq^2 \cdot \Gamma(A \to B\gamma)} = \left|F_{A\to B}(q^2)\right|^2 \cdot |\mathrm{QED}|$$

form factor: divide experimental q^2 distribution by QED

$F_{AB}(q^2) = [1 - q^2/\Lambda^2]^{-1}$ (single) pole approximation

$$F_{AB}(q^2) \simeq 1 + q^2[\mathrm{d}F_{AB}/\mathrm{d}q^2]|_{q^2\simeq 0} = 1 + q^2 b_{AB} = 1 + \tfrac{1}{6} q^2 \langle r^2_{AB} \rangle$$

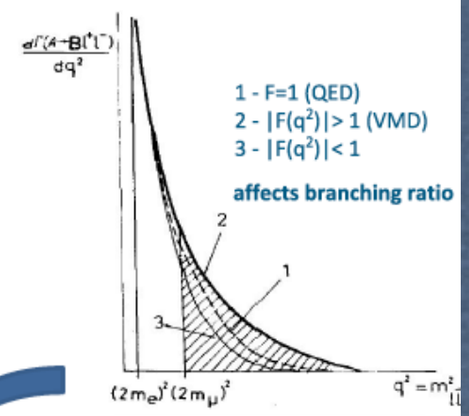
$\Lambda \simeq m_\rho \ (\Lambda^{-2} = b_{AB})$

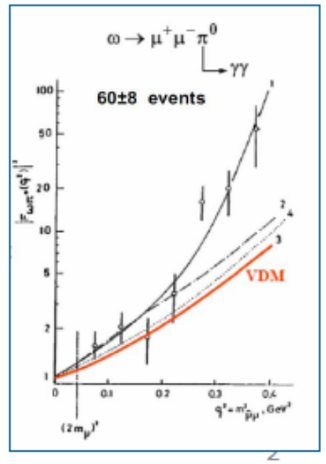
'standard' VMD

slope parameter

size (transition region)

L.G. Landsberg, *Electromagnetic decays of light mesons*

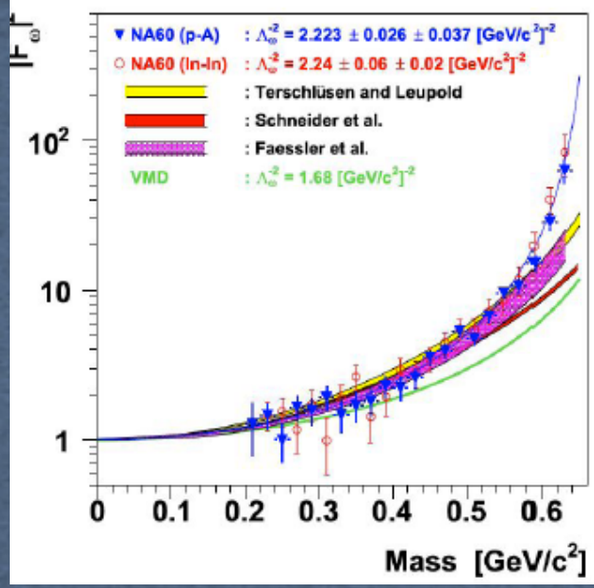




status of the ω-π transition form factor

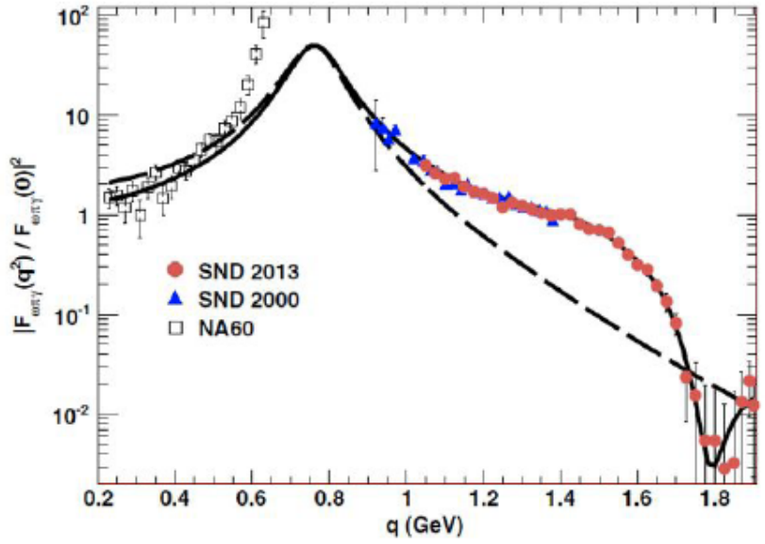
Physics Letters B 757 (2016) 437–444

Precision study of the $\eta \to \mu^+\mu^-\gamma$ and $\omega \to \mu^+\mu^-\pi^0$ electromagnetic transition form-factors and of the $\rho \to \mu^+\mu^-$ line shape in NA60



Phys.Rev. D88 (2013) 054013

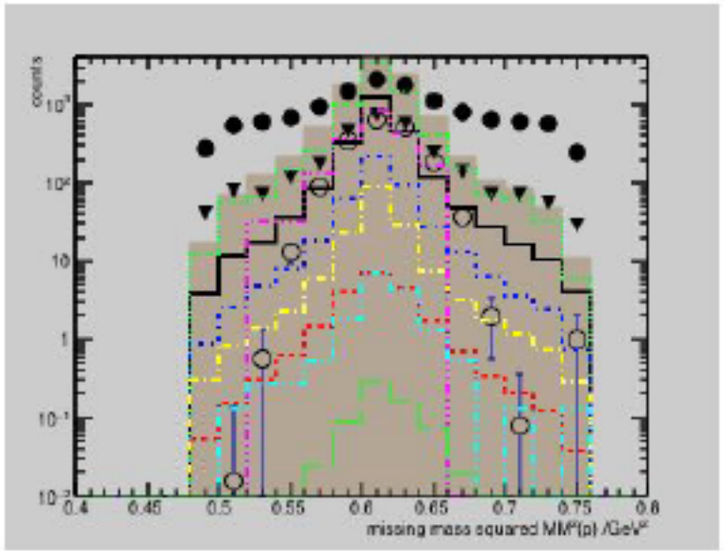
Study of $e^+e^- \to \omega\pi^0 \to \pi^0\pi^0\gamma$ in the energy range 1.05–2.00 GeV w SND

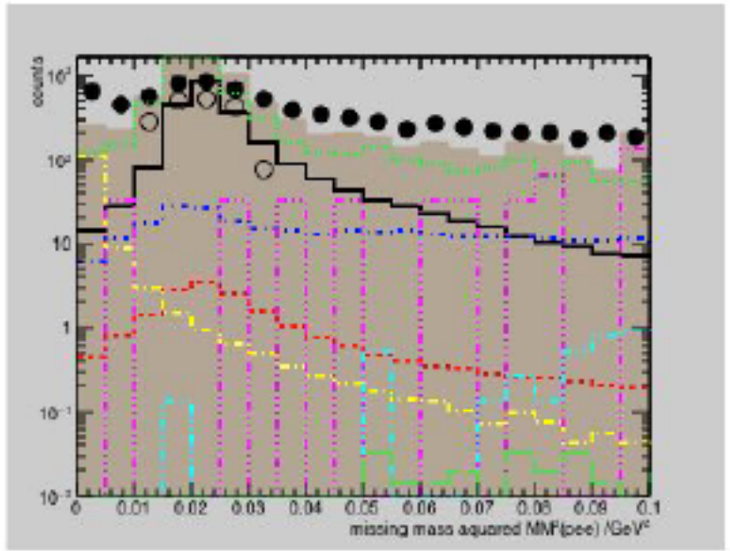


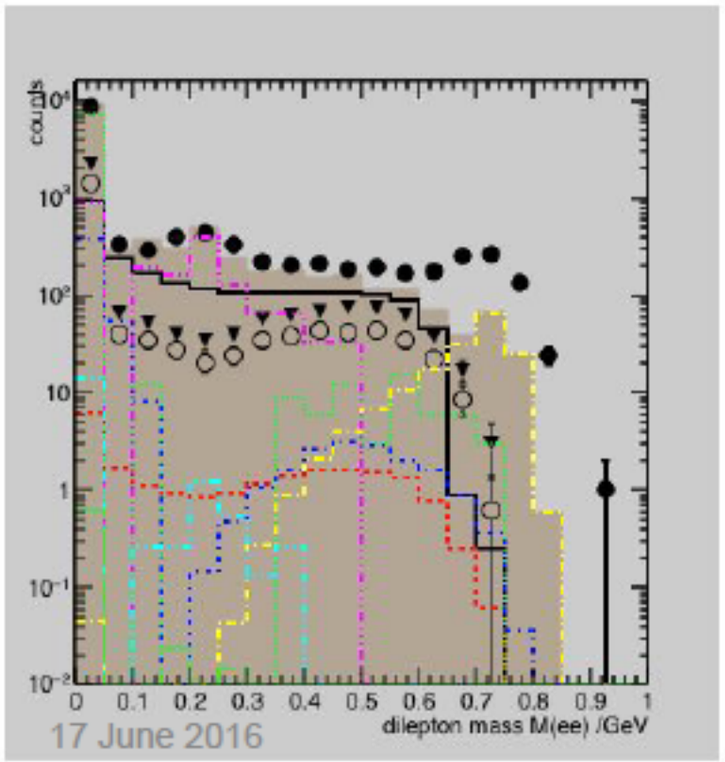
17 June 2016

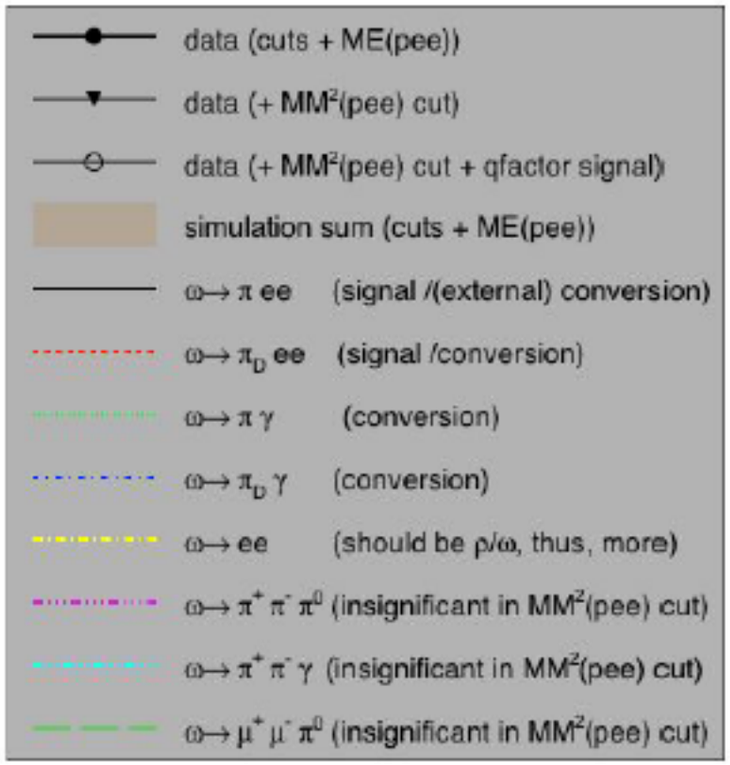
snapshot background study

CLAS g12 PRELIMINARY I $\omega \to \pi^0 e^+e^-$ I cut-based analysis: background study









- dilepton skim
- cut based (w/o kin. fit)
- cuts:
  - LepG7
  - beta leptons
  - vertex
  - MM(p) window

simulations,
PLUTO event generator

so far, 'only' omega decays

issues:

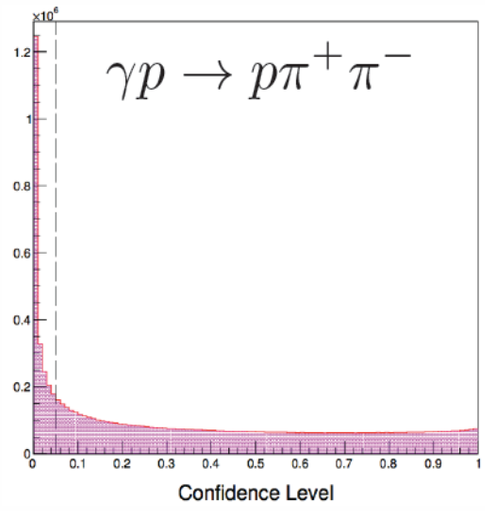
- conversion
- combinatorics
- MM(pee) cut

PRELIMINARY:
this is not done yet
(need more simulations,
no corrections,
analysis not finalized,
...)

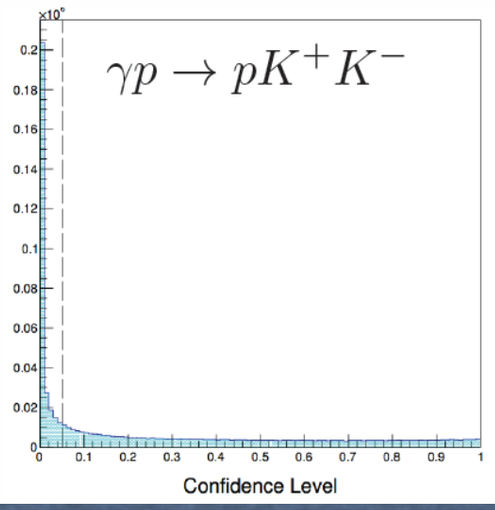
The Beam-Helicity Asymmetry for $\gamma p \to pK^+K^-$ and $\gamma p \to p\pi^+\pi^-$

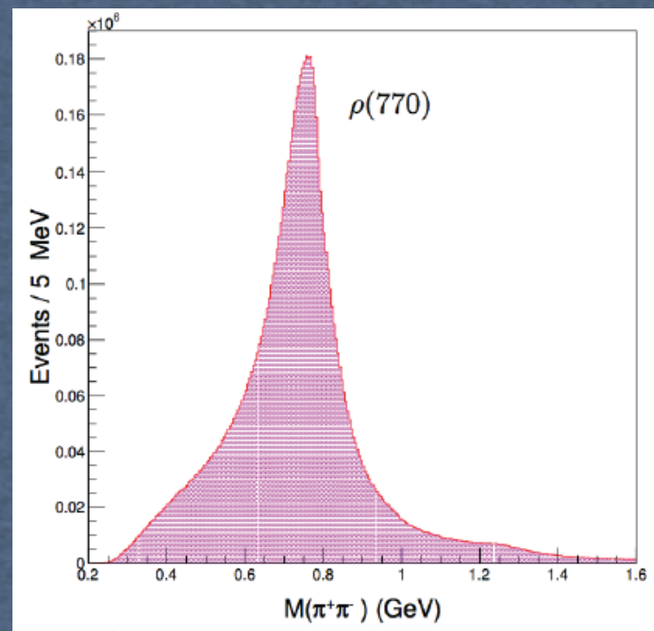
Rafael A. Badui
Jason S. Bono
Lei Guo
Brian A. Raue

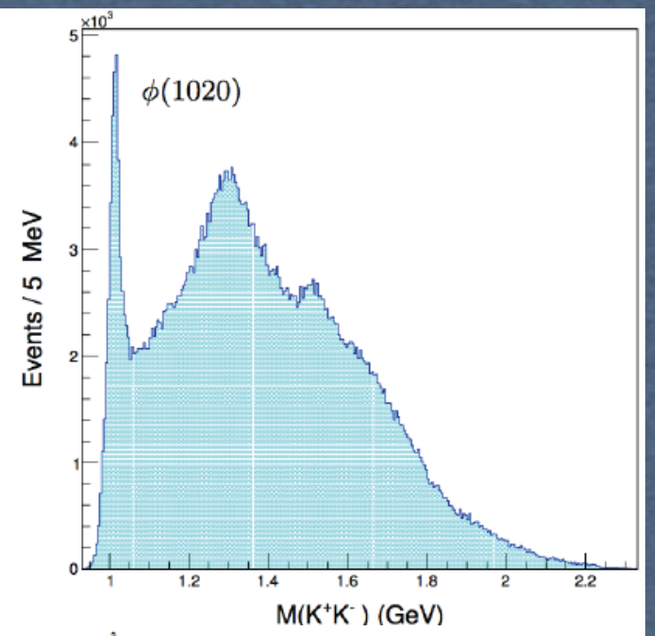
- Beam Energy Corrections
- Energy Loss
- Momentum Corrections
- Kinematic Fitting

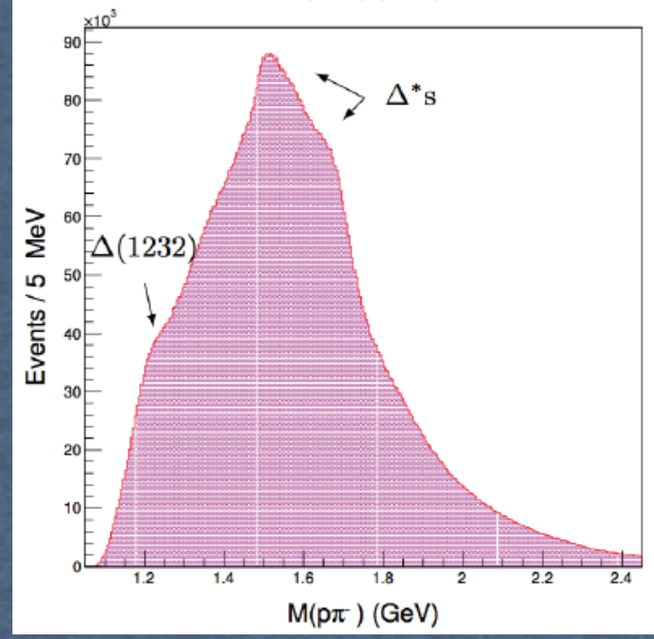


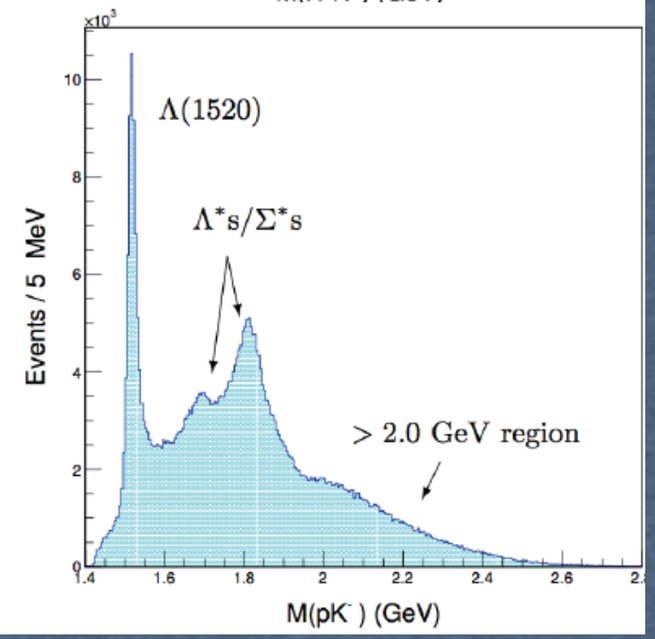
- Beam Energy Corrections
- Energy Loss
- Momentum Corrections
- Kinematic Fitting











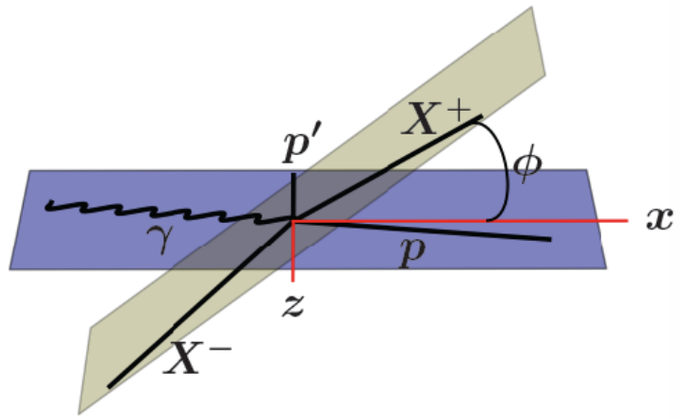
- In a given kinematic bin, τ, the beam-helicity asymmetry is defined as

$$I^{\odot}(\tau) = \frac{1}{P_{\gamma}(\tau)} \frac{\sigma^{+}(\tau) - \sigma^{-}(\tau)}{\sigma^{+}(\tau) + \sigma^{-}(\tau)}$$

- It is measured experimentally as

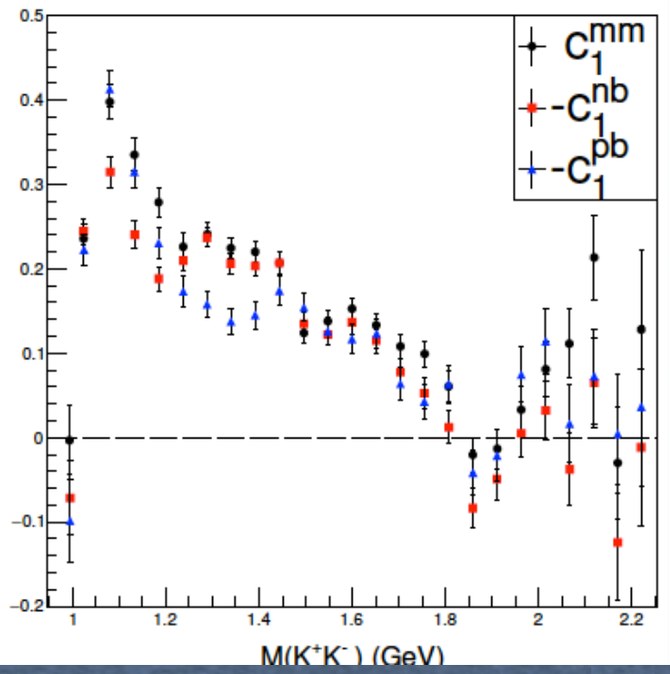
$$I^{\odot}_{\text{exp}}(\tau) = \frac{\frac{Y^{+}(\tau)}{\alpha^{+}} - \frac{Y^{-}(\tau)}{\alpha^{-}}}{\frac{N^{+}(\tau)}{\alpha^{+}} + \frac{N^{-}(\tau)}{\alpha^{-}}}$$

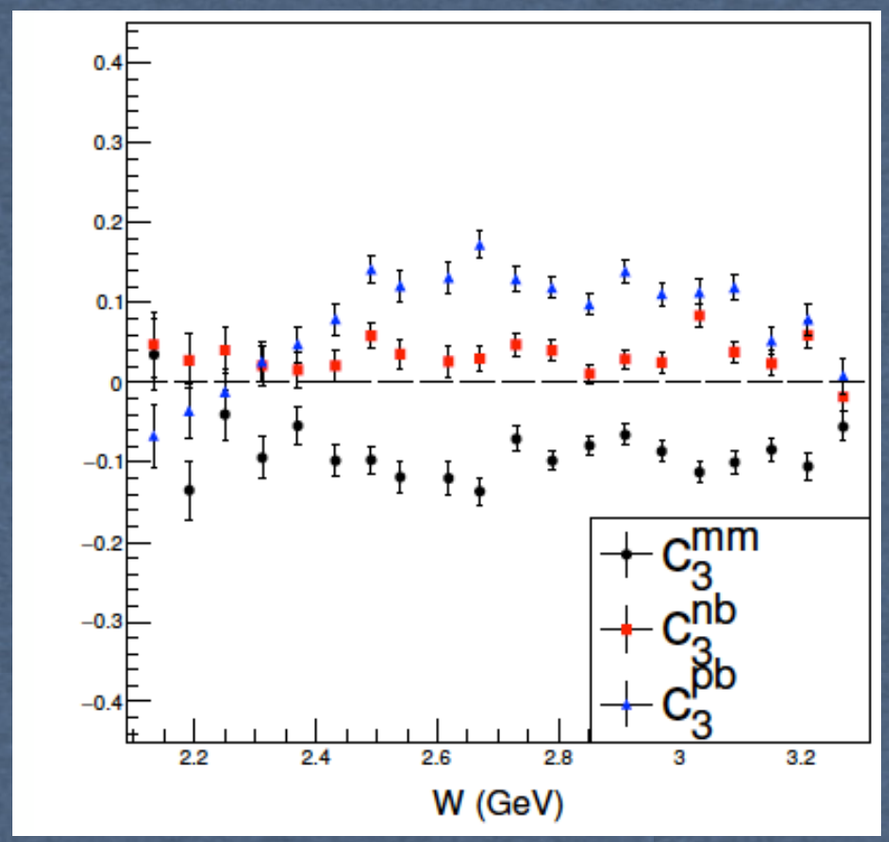
- Beam-Helicity asymmetry was measured with respect to the angle between two predefined planes
- Figure on right defines the "Meson-Meson Plane Configuration"



Beam-Helicity Asymmetry

- Apparent agreement among leading coefficients for different plane/angle configurations across all kinematics (up to sign of the permutation)
- Also true for pion channel
- Not true for other coefficients





Exclusive π^- Electroproduction off the Neutron in Deuterium in the Resonance Region

Ye Tian

University of South Carolina
Department of Physics and Astronomy

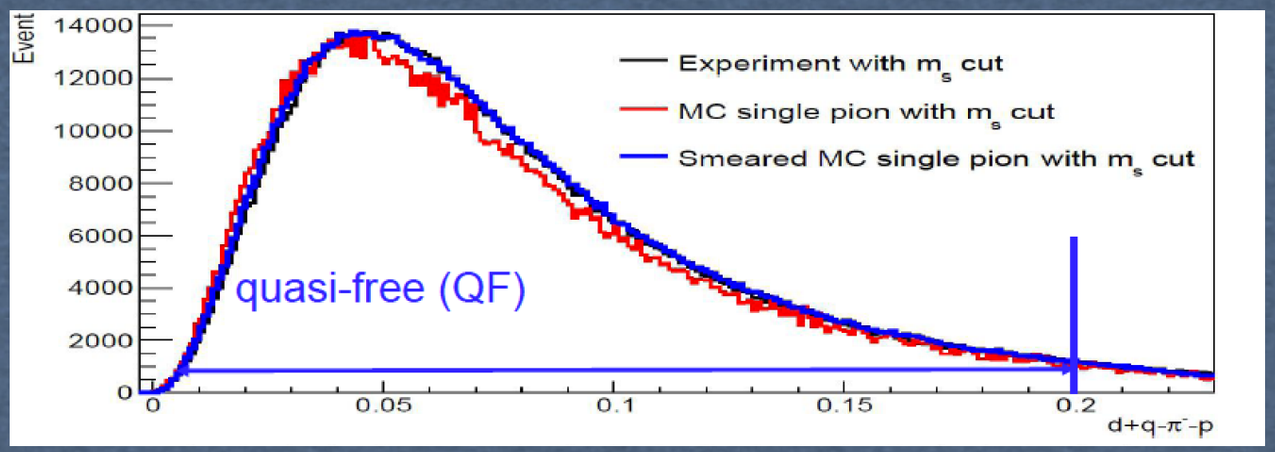
- There is no free neutron target, the deuterium target is the alternative target, because it contains the simplest and most loosely bound nucleon system.
- In order to extract the free neutron information, we have to deal with the final state interaction and correct it from the quasi-free process.

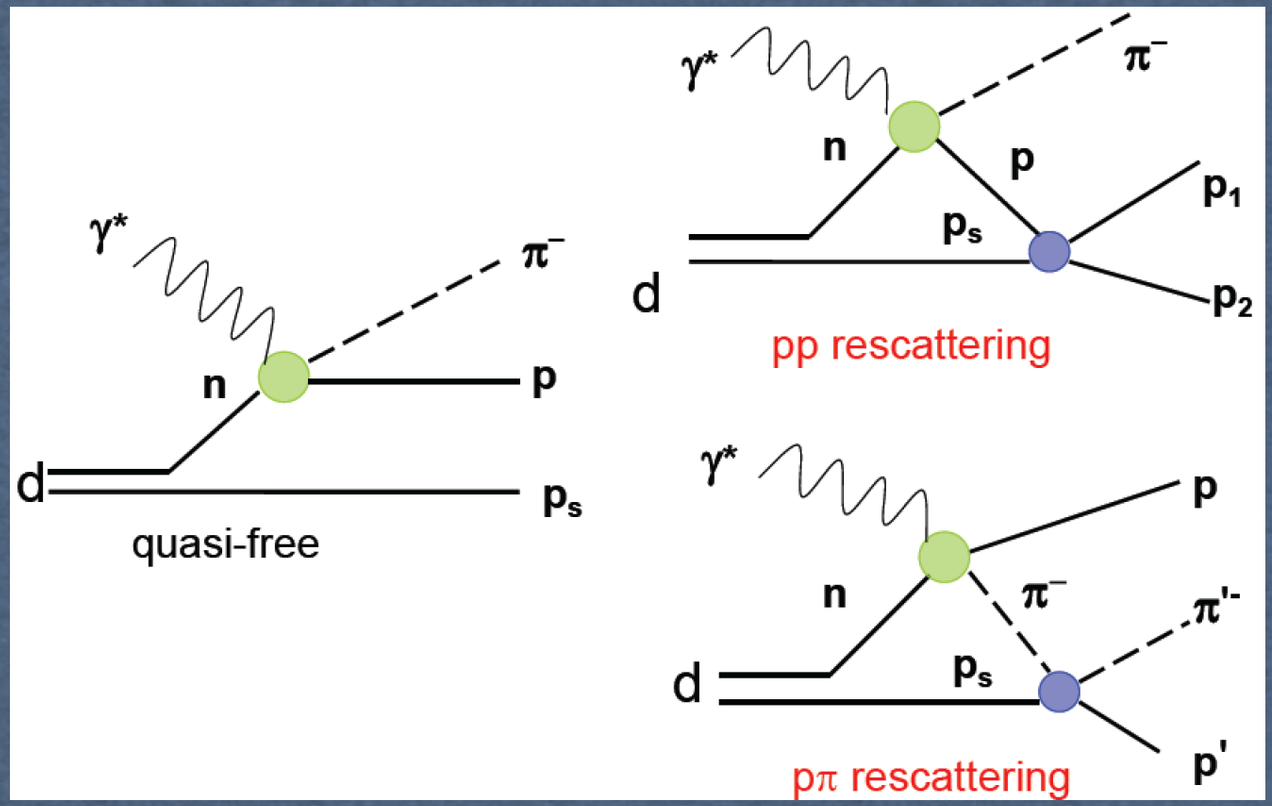
$\gamma^* + p \rightarrow \pi^0 + p$ } H_2 target

$\gamma^* + p \rightarrow \pi^+ + n$

$\gamma^* + d(p) \rightarrow \pi^+ + n + n_s$ (Hollis) } D_2 target — e1e run

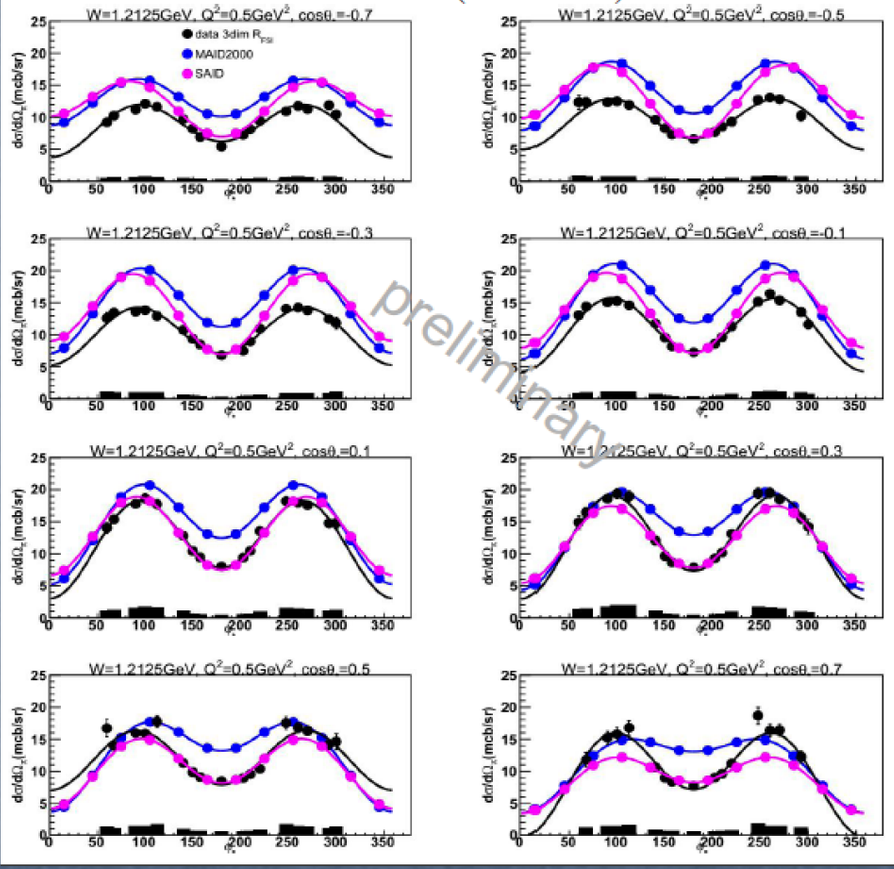
$\gamma^* + d(n) \rightarrow \pi^- + p + p_s$





Preliminary results

Q^2=0.5GeV^2 $\cos\theta^* \in (-0.8, 0.8)$ $\Delta\cos\theta^* = 0.2$



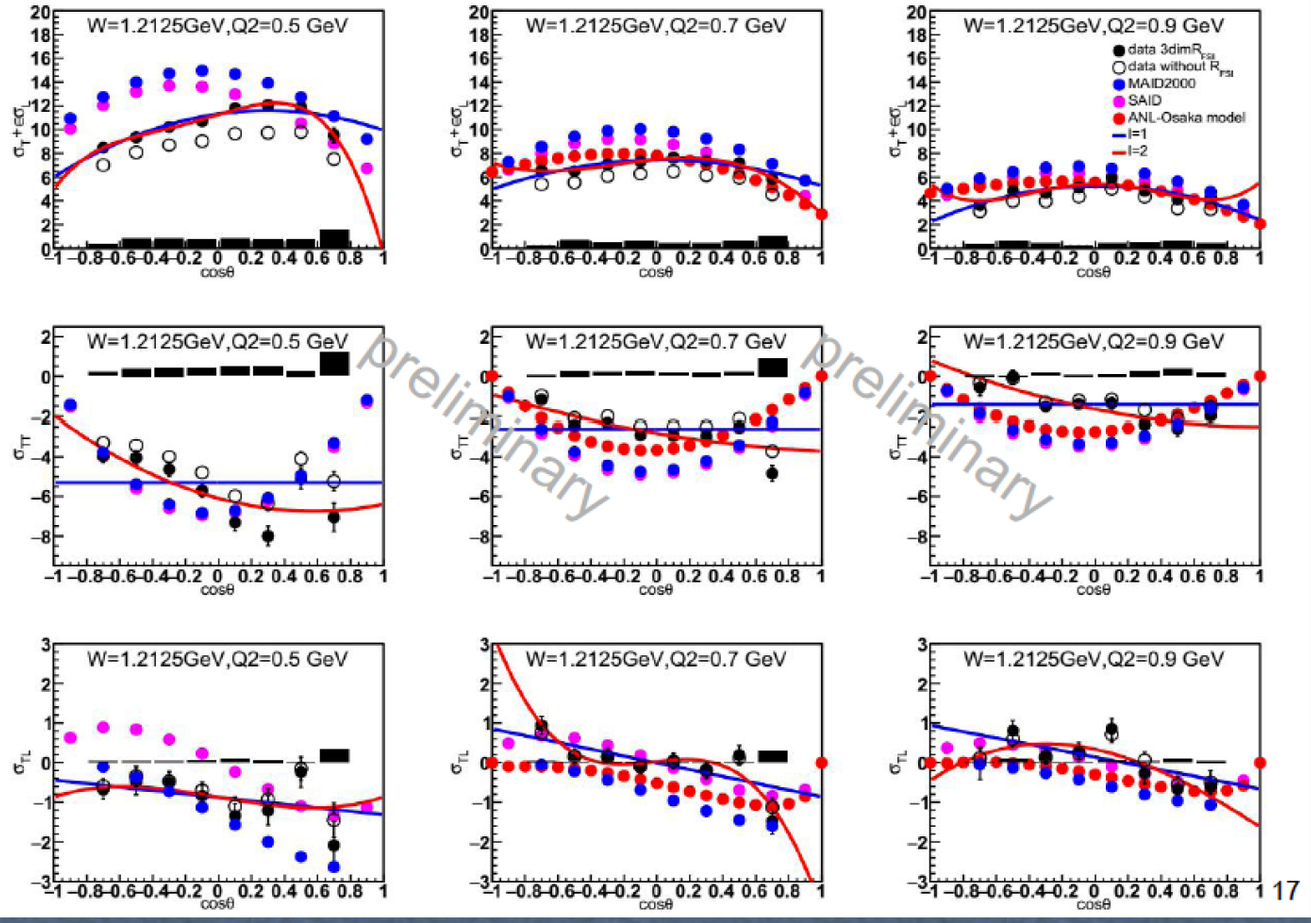
The Legendre polynomial expansion of the structure functions

$$\sigma_T + \varepsilon\sigma_L = \sum_{i=0}^{2l} A_i P_i(\cos\theta_\pi^*)$$

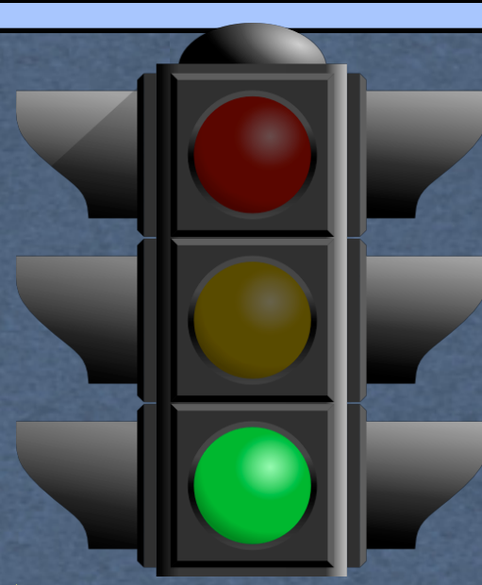
$$\sigma_{TT} = \sum_{i=0}^{2l-2} B_i P_i(\cos\theta_\pi^*)$$

$$\sigma_{LT} = \sum_{i=0}^{2l-1} C_i P_i(\cos\theta_\pi^*)$$

Preliminary results



WG Reviews status



Spin observables in eta meson photoproduction on the proton from FROST data
PI: R.Tucker (ArizonaU) et al.
RC: K.Livingston, J.Price, Xiangdong Wei
Timeline: jun 2016
Status: just started

Measurement of Sigma in pi- photoproduction on the neutron from the g13b dataseta
PI: D.Sokhan (GlasgowU) et al.
RC: Eugene Pasyuk (Chair), Nicholas Zachariou , Paul Mattione
Timeline: jun 2016
Status: just started

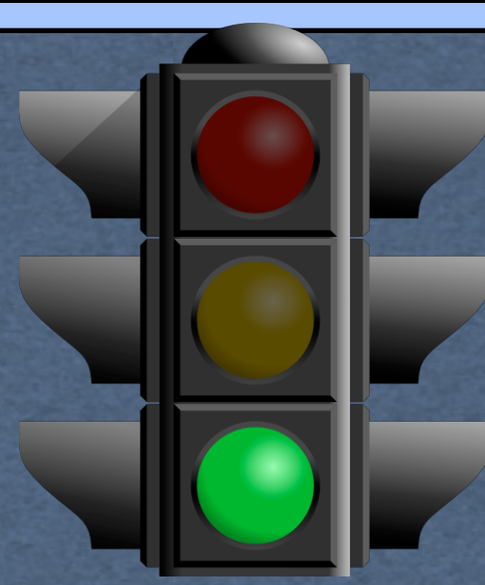
New
since last meeting

Polarization Observables in g(pol)p(pol)->ppi +pi-Using the g9a (FROST) Target and CLAS
PI: V.Crede (FSU) et al.
RC: K.Livingston, V. Ziegler, E. Golovach
Timeline: Sep 12 2013 started,

gamma+p -> p K+ K- reaction
PI: S.Lombardo (Cornell)
RC: P.Eugenio, D. Schott, D. Carman
Timeline: started Jan 17 2014

DONE!

WG Reviews status



Gamma p to K0K0 from the g12 Data Set
PI: Kenneth Hicks and Shloka Chandavar
RC: Carlos Salgado (Chair), Derek Glazier , Lorenzo Zana

K0Λ Photoproduction on the Neutron within the Resonance Region
PI: Nick Compton
RC: L.Zana, E.Isupov, S.Schadmand

Exclusive Photo-Production Measurement of K+Sigma*- off Quasi-Free Neutrons in Deuterium
PI: H.Lu (SCU) et al.
RC: N.Zachariou, M.Dugger, D.MacGregor

Pentaquark search in g10 by using the MMSA method
PI: Kenneth Hicks et al.
RC: Stepan Stepanyan (Chair), Lei Guo , Bryan McKinnon

In progress

Polarized structure function sigmaLT from the single pi0 electroproducion on the proton in the resonance region
PI: Nick Markov
RC: V.Crede, Ralf Goethe, Yelena Prok

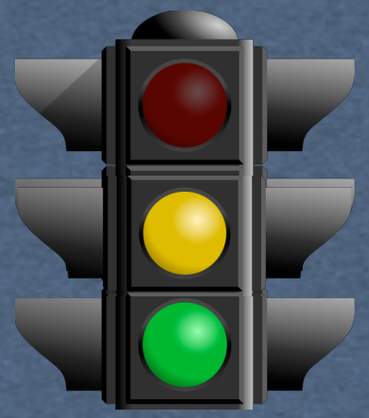
Spin observables in omega production
PI: Brian Vernarsky
RC: F.Klein, A.Filippi, S.Strauch

2pi photoproduction from g11
PI: Evgheny Golovach et al.
Ralf Gothe (Chair), Lei Guo , Alessandro Rizzo

WG Reviews status

E asymmetry for g n -> pi^- p from g14 (HDice) data
PI: F.Klein
RC: B.Briscoe, P.Cole, M.Dugger
Status:?????

KLambda and KSigma from FROST
PI: N.Walforf et al.
RC: S.Strauch, M.Holtrop, P.Mattione,
1 round of comments in May 2015, waiting for a revised
Status: stalled



Exclusive Photo-Production Measurement of K +Sigma*- off Quasi-Free Neutrons in Deuterium
PI: H.Lu (SCU) et al.
RC: N.Zachariou, M.Dugger, D.MacGregor
Status: resumed with reshuffled committee, still waiting …

Data analysis technique for obtaining gamma p -> eta p, gamma p -> eta' p and gamma p -> omega p beam asymmetries from the g8b running period
PI: Mike Dugger (Patrick Collins)
RC: L.Guo, D.Sober, E.Golovach
Timeline: Jan 2013started, Feb 1st round
Status: ??? no feedback from the PI

- 3 HSWG proposals reviewed
  - Transition Form Factors of the $_0$ and Mesons with CLAS12
    - PI: M.Kunkel et al.
    - Review Committee: D.Glazier (chair), K.Hicks, P. Roy
  - A Search for Hybrid Baryons in Hall B with CLAS12
    - PI: A.D'Angelo et al.
    - Review Committee: D.Watts (chair), N.Markov, C.Salgado
  - Nucleon Resonance Structure Studies Via Exclusive KY Electroprod. at 6.6 and 8.8 GeV
    - PI: D.Carman et al.
    - Review Committee: G.Niculescu (chair), KA.Filippi, L.Guo

PAC44

- First g12 related analysis
  - Reduced review committee: 2 reviewers + 1 link to the g12 analysis
  - Short review (few weeks), limited to the analysis procedures not yet approved by g12
    - Cascade polarization in photoproduction
    - PI: J.Bono
    - Review Committee: A.D'Angelo (chair), M.Kunkel + E.Pasyuk (from g12 rungroup review comm)

Homeworks

Derek's talk at the CLAS12 Workshop

- Analysis framework for the first (and second) experiment(s)
- Re-organization of the the HSWG in CLAS12 era:
  - development of a common analysis framework (high level analysis?)
  - role in raw data calibration and correction
  - analysis review : tutoring? run-group analysis?