

Exclusive Reaction Extraction Methods and Validation

F.-X. Girod

Jefferson Laboratory

July 12th 2018



Preliminary general remarks

- The **CLAS collaboration** is not in the business of publishing PDFs
Past attempts to do so by Hall A and Hall B teach us this
- The **CLAS collaboration** should make the best possible efforts to publish **model-independent** data that can be re-interpreted later
- The **CLAS collaboration** currently has other pressing software priorities than developing higher level extraction methods. I hope that all CLAS collaborators have well taken that important point.
- What was done in the past to publish asymetries and cross-sections?



Exclusive reactions general remarks

Low statistics

Typically large bins in the final analysis
Exclusivity variables used to reject backgrounds
Not very sensitive to resolutions (unless background large)

Multidimensional

Cross-sections and acceptances may display steep gradients inside bins. If gradients change significantly within the bins, this entails substantial corrections

Exclusivity

Redundancy in kinematics, for instance, the same momentum transfer from the proton side or the virtual photon side. These choices result in **different corrections**, such as background subtraction or radiative corrections. Therefore, corrections require detailed knowledge of experimental procedures: cannot be let up to theoreticians, unless they sign on as limited CLAS members.



Role of Fast Monte-Carlo

Systematical uncertainties

Single particle resolutions and acceptances are used as input to the Fast Monte-Carlo. Comparison with data demonstrates that both of those are actually under control

Folding

Radiative corrections are folded in together with acceptances and resolutions, up to a "vcut": may be a series of correlated cuts, the result of a likelihood, or even a purity cut based on a neural network

Model Iteration

Phenomenological GPDs/CFFs used as input in the model iterated until agreement between input and output observables. This validates the chain entire from the generator and is used to evaluate systematical uncertainties.

