

ϕ Meson Electroproduction: Going Forward

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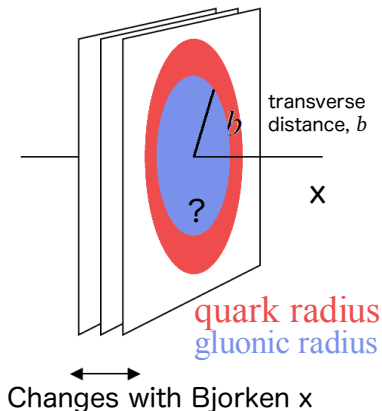
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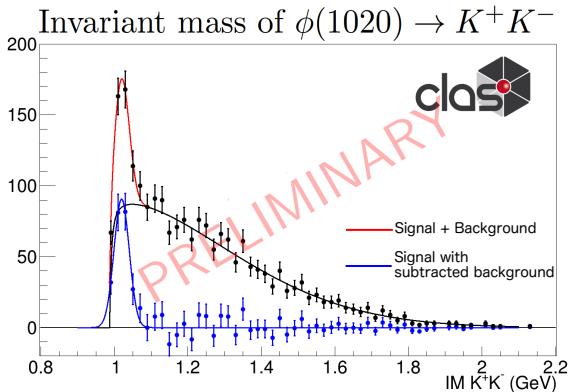
Physics Motivation

- Generalized parton distributions (GPDs) for 3-D structure of nucleon
 - ▶ longitudinal momentum distributions and transverse spatial distributions of quark and gluons.
- Efforts to explore quark structure, but little is known about the gluonic structure.
- Access gluonic GPDs through $\phi(s\bar{s})$
 - ▶ $ep \rightarrow e'p'\phi \rightarrow e'p'K^+K^-$



Recap

- Particle ID has been developed
- Illustrated preliminary detection of fully exclusive ϕ meson
- Outbending field is preferable for fully exclusive events



Going Forward

Two fronts that need to be attacked to extract the cross section and beam spin asymmetry:

- Simulation
- Experimental

Physics Observables: Cross Section

Measuring the cross section requires:

- total integrated luminosity
- acceptance corrections
- efficiencies of detectors
- radiative corrections

Physics Observables:BSA

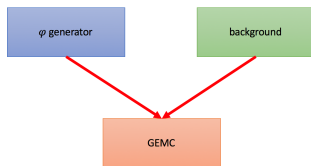
Measuring the beam spin asymmetry requires:

- requires well understood polarization of incident electron beam.

Simulation

Approx. 10x the amount of data should be generated for simulation.

- Reasonable parameterization of model
- Background to merge into simulation
- Determine detector subsystem efficiencies
- Measure detector subsystem resolutions
- Detector acceptance for FD and CD
- Radiative correction with FastMC



Experimental Configuration/Analysis

■ Require:

- ▶ incorporate Kinematic Fitting
- ▶ calibration of drift chambers for improved hadron momentum reconstruction
- ▶ fully calibrated and cooked Spring run data set
 - ▶ outbending at 10.6 GeV data provides at least 100 ϕ candidate events
 - ▶ inbending at 10.6 GeV data provides about 60 ϕ candidate events.