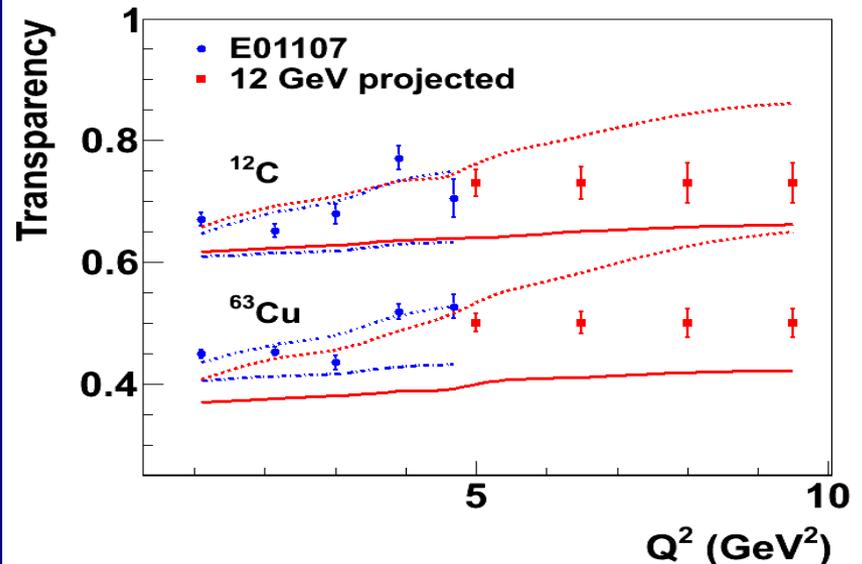
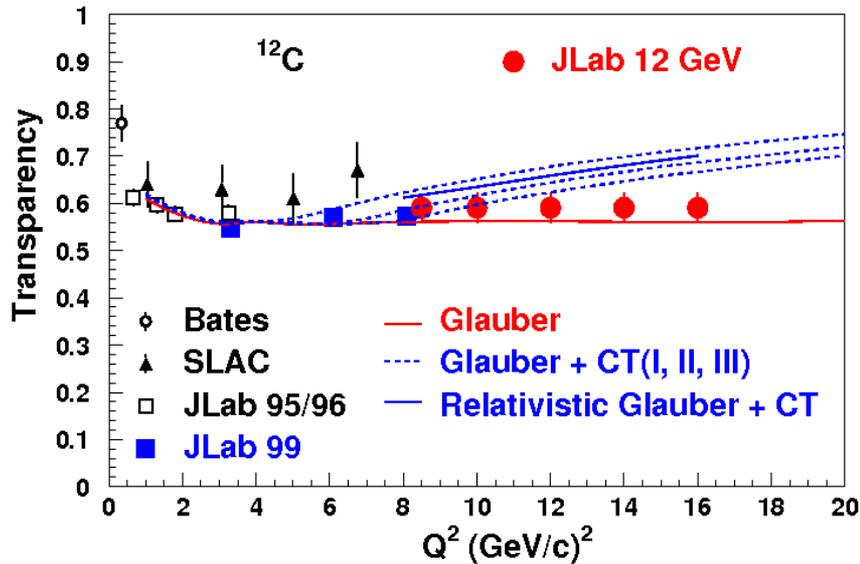


E12-10-104: Hadron Propagation and Color Transparency at 12 GeV



$A(e, e'p)$ cross-section on ^1H and ^{12}C with $80\mu\text{A}$, of 8.8 & 11.0 GeV beam.

$A(e, e'\pi)$ cross-section on ^1H , ^2H , ^{12}C and ^{63}Cu with $80\mu\text{A}$, of 11 GeV beam.

HMS: electron arm, SHMS: hadron arm

PID: Standard detector package + Aerogel in SHMS

Total beam time requested = 629 hrs ~ 26 days

Spokespersons: R. Ent & D. Dutta

E12-10-104: Hadron Propagation and Color Transparency at 12 GeV

- Measurement of proton and pion transparencies will provide an understanding of the propagation of highly energetic particles through the nuclear matter.
- The $A(e, e'p)$ process will provide valuable information on the interpretation of the rise in transparency found in the BNL $A(p, 2p)$ experiments. This is true even if these experiments do not find a rise in transparency in the Q^2 range covered. There is large overlap with the beam momentum range of the BNL experiment.
- The $A(e, e'\pi^+)$ process can map the region in Q^2 from
 - the onset of CT to $\sim 10 \text{ GeV}^2$, where such effects
 - validate the strict applicability of factorization
 - theorems for meson electroproduction experiments.

E12-10-104 & SHMS

SHMS used as hadron arm

$A(e, e'p)$ needs

p/π separation

Singles rates $< 10\text{kHz}$

p/π ratio 1:1 - 1:2

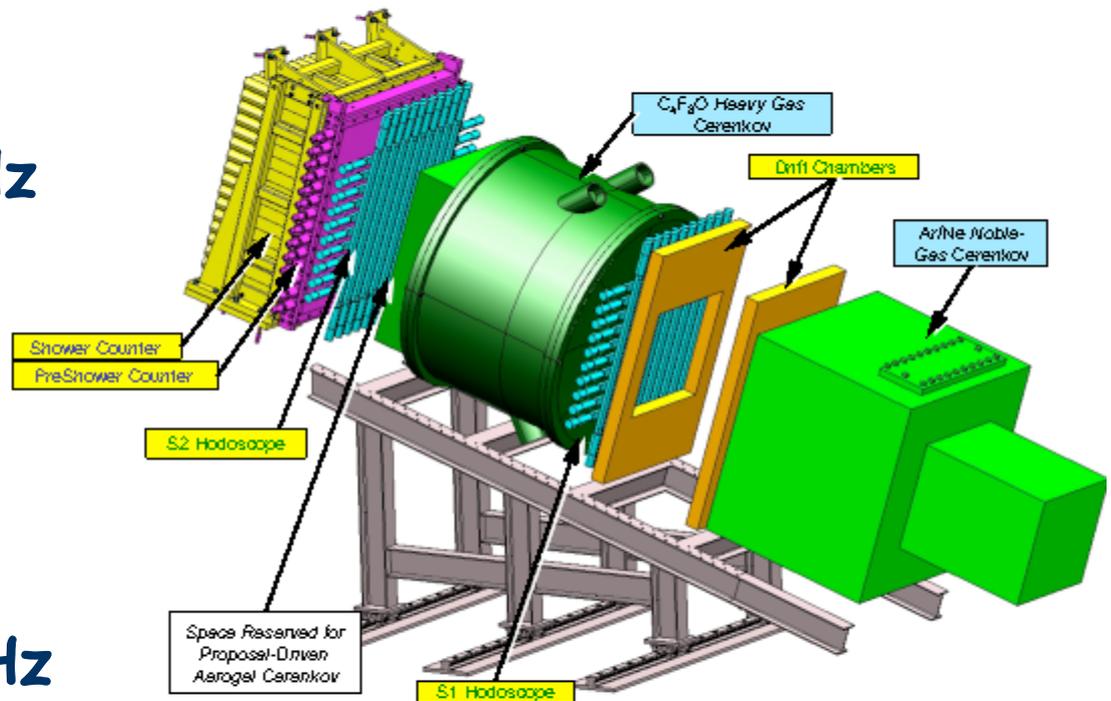
$A(e, e'\pi)$ needs

$\pi/p/K$ separation

Singles rates $< 30\text{kHz}$

π/p ratio 2:1 - 1:1

Need aerogel which is under development



Spokespersons Contributions

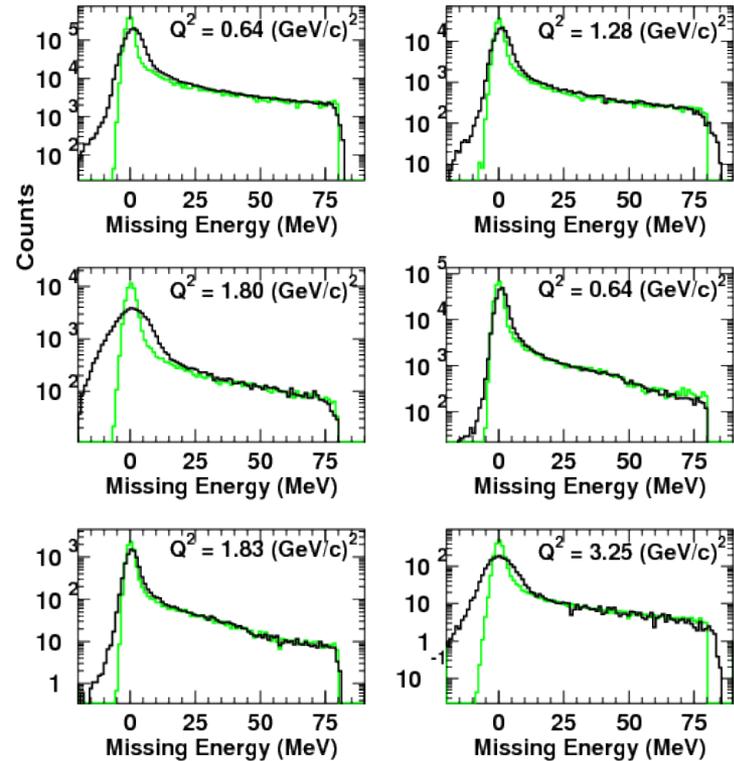
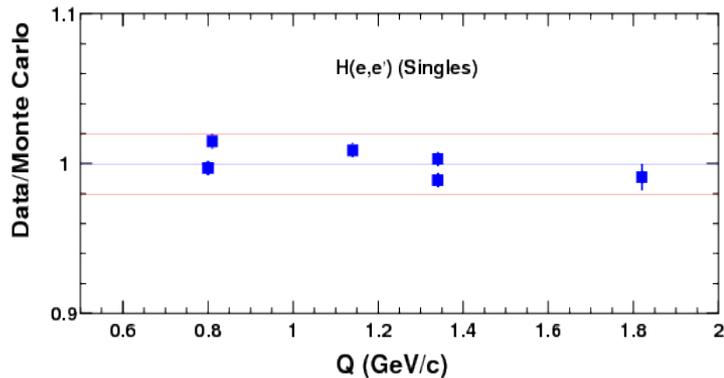
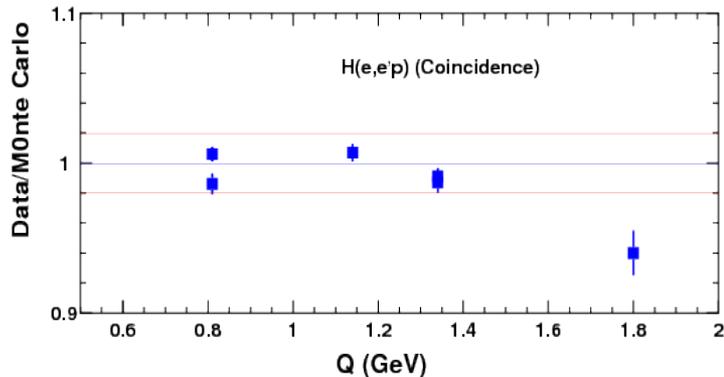
- Rolf Ent: SHMS design and commissioning
- D. Dutta: Help design and commission collimators and sieve slits for SHMS, GEM forward tracker, part of NSF/MRI for aerogel
- Spokespersons and collaboration commissioned HMS using the same kind of experiment at 4 GeV
- Extensive experience running experiments successfully in Hall-C and commissioning new equipment
- We welcome all Hall-C user to participate

E12-10-104: A Possible Commissioning Expt.

- $H(e, e'p)$ needed to commission spectrometer is part of the experiment
- Smooth well known cross sections will aid quick diagnostic of spectrometer
- Analysis framework (SIMC) already exists, online results can be used as diagnostics
- Monte Carlo SIMC was built for this process.
- Walks and quacks like a commissioning experiment.
- Can provide a calibrated SHMS for expts. that follow

E12-10-104: A Possible Commissioning Expt.

H(e,e'p) results from the Hall-C commissioning experiment E91-013



The simulation and analysis packages were advance enough in 1994-95 such that rates were monitored online at the 10% level. We can do even better now and any problems can be found earlier if this experiment is used for commissioning.

Pros and Cons of Early Running (and a possible commissioning plan)

Pros: Coincidence experiment that can be used to commission the SHMS and re-commission HMS

Kinematic and running conditions are middle of the road, nothing being pushed to their limits.

($ee'p$) part of experiment is the ideal for commissioning

Cons: Requires 8.8 and 11 GeV energy and the ($e, e'\pi$) will need the aerogel to be commissioned as well

Commissioning Plan:

1. Start with ($e, e'p$) with 8.8 GeV beam energy.
2. Simultaneously commission the aerogel detector
3. Finish with ($e, e'p$) at 11 GeV and the ($e, e'\pi$) at 11 GeV