

Hall C Proposals @ 12 GeV



- Original JLab Physics Program started in 1995, with first physics proposal approved in 1989 $\rightarrow \Delta = 6$ years.
- Dedicated 12-GeV PAC with 12-GeV Proposals some 6 months after CD-1 approval $\rightarrow \Delta \sim 6$ years
- Halls A & B have collaboration structure, but
- **Hall C a simple user community, with 400+ users representing 20 different countries, and a steering committee to represent user community.**
- How do we organize 12-GeV proposals?

Reminder: Overview of 12-GeV physics in Hall C

Discussion: Organization of 12-GeV proposals?

Hall C Physics at 12 GeV:

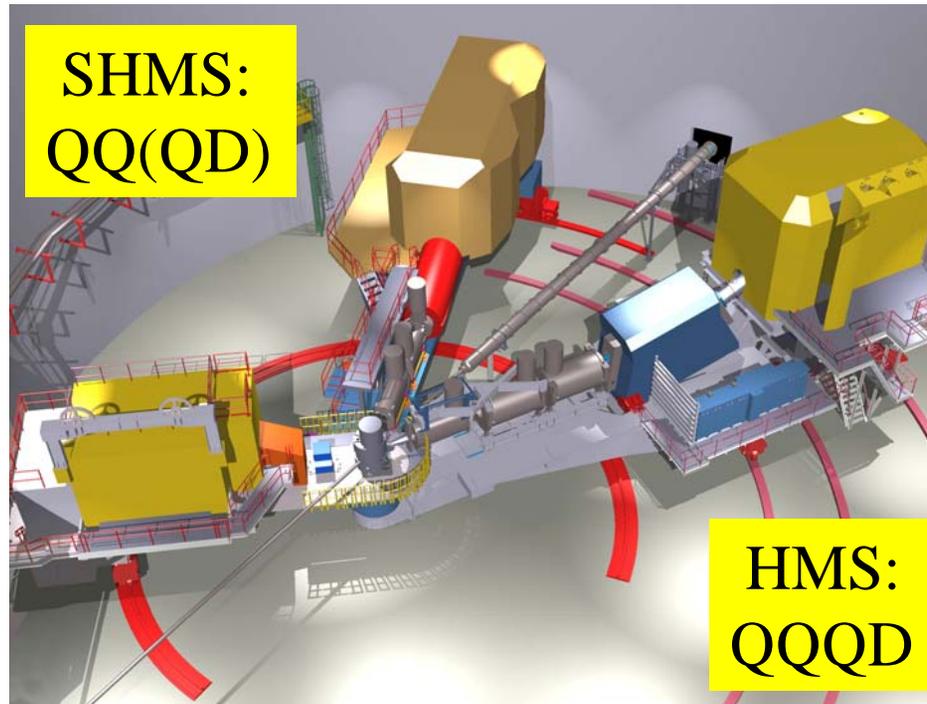
Magnetic Spectrometer Pair Capable to Handle Full 12 GeV Energy & Luminosity

(Note: 12 GeV means 11 GeV to Halls A/B/C)

	HMS	SHMS
Momentum Range	0.4 - 7.3	2 - 11
Angle Range	10.5 - 90	5.5 - 25
Solid Angle	~8 msr	2-4 msr
Momentum Acceptance	20%	40%
Target Length@90°	10 cm	50 cm (for free)

Hall C Infrastructure Remains (But Less Floor Space on SHMS Forward Angle Side) for Some Large-Installation Experiments.

Hall C @ 12 GeV: add SHMS (11 GeV)



SHMS emulates the essential features of HMS:

A rigid connection to the pivot, a precision rail system, vacuum, a simple and reproducible point-to-point optics design, a flat and easily understood acceptance, and a heavily shielded hut with redundant detectors allowing for detailed cross checks.

HMS and SHMS will provide a flexible and reproducible spectrometer pair that can handle the **full energy and luminosity** capabilities at 12 GeV with low reconfiguration overhead and high physics throughput.

Hall C at 12 GeV: HMS + SHMS

- Charged particle detection with momentum up to beam energy $z = E_h/v = 1$
- Small angle capability essential to measure charged particle along momentum transfer $\theta_h // q \pm \text{few } ^\circ$
- Precision L/T separations
$$\sigma = \Gamma(\sigma_T + \varepsilon\sigma_L + \varepsilon \cos(2\phi)\sigma_{TT} + [\varepsilon(\varepsilon+1)/2]^{1/2}\cos(\phi)\sigma_{LT})$$
- High Luminosity $L = 10^{38}$

→ Exclusive and Semi-Inclusive Reactions ($z > 0.3$) at high Q^2
→ Separation of Polarized and Unpolarized Structure Functions over large range of x and Q^2
→ Small Cross Sections

Hall C Physics at 12 GeV

HMS-SHMS: Spectrometer Pair Capable to Handle Full 12 GeV Energy & Luminosity

- Pion Form Factor up to $Q^2 = 6 \text{ GeV}^2$
- Nucleon Elastic and Transition Form Factors up to $Q^2 \sim 15$
- Real Compton Scattering up to $s \sim 20$
- Exclusive π and K Electroproduction up to $Q^2 \sim 10$
- Precise L/T Separations up to $Q^2 \sim 10$
- SIDIS Reactions Requiring Precision Measurements
- Smallest Cross Sections at large x (spin structure & $x > 1$)
- Precision EMC-type Measurements
- Color Transparency Measurements up to $Q^2 = 18$

This program will render the highest Q^2 for Exclusive Reactions, and the highest Q^2 for L/T Separations for the foreseeable future!

- Precision Tests of the Standard Model
 - Parity Violation in Deep Inelastic Scattering
 - Factor 20 improvement in $(2C_{2u} - C_{2d})$
 - Moller Parity Experiment at JLab → Dedicated Setup

Hall C Proposals @ 12 GeV



Discussion: Organization of 12-GeV proposals?

Summary:

- ❑ Some additional organization of this proposal process is required in view of new beam properties and equipment.
- ❑ Mail Hall C User Community few months before actual 12-GeV PAC proposal submission deadline a general e-mail, including
 - 1) Request for information what proposals Hall C users think about submitting to be informed about possible overlaps.
 - 2) Announcement of "deadline" some 1.5 month before this 12-GeV proposal submission date, by which time users are requested to send rough drafts to Hall C staff, who will do a technical review.
- ❑ Hall C staff will pass results of technical review and general comments on proposals on to spokespersons within 2-3 weeks.