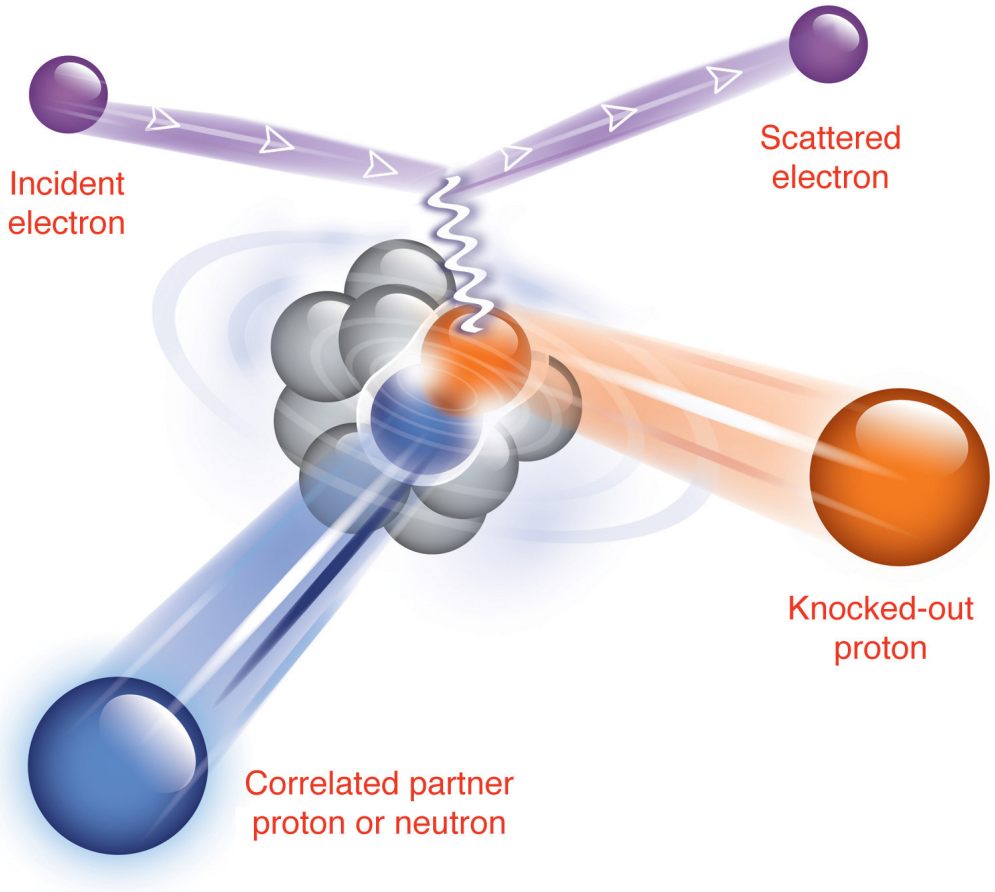
Collaboration meeting E07-006

7 Dec 2010 JLab .



Global picture

Set -Up

02/11/11	Friday	1.1	Set-Up	2.262/80	TPE	5.562/50	Qweak	1.162/150/p	
02/12/11	Saturday	1.1	Set-Up	2.262/80	TPE	5.562/50	Qweak	1.162/150/p	
02/13/11	Sunday	1.1	Set-Up	2.262/80	TPE	5.562/50	Qweak	1.162/150/p	

Pass 2 H / Solid targets

Goals :

1. commission of HRSs
2. Commission of BB
3. Commission of n-array

FPP ?

Total 11 shifts

Setup /elect/HRSs - 2 shifts
n-array - 2 shifts
BB -2 shifts

1-shift –fixes in Hall, 1 shift- beam tune

Thursday 10 Feb 2010

Area closed 6-8 PM

Beam tune / beam available by mid night

HRS_L	(-) 27.5^0, 1.77775
HRS_R	(-) 12.5^0, 1.2042
BB	back angle
HAND	-50^0 15 m

Friday 11 Feb 2010

Owl 00-8 AM

Beam study 2 pas

(spot++ /, beam characteristics, charge monitors)

Beam: 2 pass
Target : C
Detectors:
HRS_L (-) 27.5^0 ,1.77775
HRS_R (-) -15.0^0,1.2042
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T6,T7)
Software: HRS singles
HAND singles
BB singles

Check timing (ADC gates, TDCs stop/start) establish singles Triggers: HRS, BB, HAND: T1,T2,T3,T4,T6,T7

Check HRSs, BB, n-array: all elements are working fine

check that BB magnet sweeps protons after ramp-up (can look at ADC)

Make a list of things to fix on the day shift

Experts needed: trigger electronics, HAND, BB experts

Friday 11 Feb 2010

Day 8AM - 4PM

Area open for last fixes before the weekend

Beam: 2 pass
Target : C
Detectors:
HRS_L (-) 27.5^0 ,1.77775
HRS_R (-) -15.0^0,1.2042
BB- back angle
HAND -50^0 15 m
Trigger : cosmic
Software: HRS singles
HAND singles
BB singles

Friday 11 Feb 2010

Swing 4PM – mid night

Beam: 2 pass
Target : C
Detectors:
HRS_L (-) 27.5^0 ,1.77775
HRS_R (-) -15.0^0,1.2042
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T6,T7)
Software: HRS singles
HAND singles
BB singles

Continue Friday Owl –a second setup shift

Check timing (ADC gates, TDCs stop/start) establish singles Triggers: HRS, BB, HAND: T1,T2,T3,T4,T6,T7

Scalers

Experts needed: electronics

Check HRSs BB n-array: all elements are working fine

Saterday 12 Feb 2010

Owl mid night – 8 AM

HAND commission

Singles HAND

Verify all elements are working

Get the punch through point and threshold values checked

Adjust HVs if needed adjust timings of gates

Experts needed: HAND

Calibrate HAND & veto HV/gain/threshold using the known momentum energy deposit.
Calibrate HAND & veto and position.

Beam: 2 pass

TARGET : any

Detectors:
HRS_L (-) ~~27.5~~^{0}
HRS_R (-) -15^0
~~BB~~- back angle
HAND -50^0 15 m
Trigger : T6, T9
Software: HRS singles
special HAND
calibration codes

Saterday 12 Feb 2010

Day 8AM - 4PM

Beam: 2 pass
Target: H
Detectors:
HRS_L (-) 27.5^0 ,1.77775
HRS_R (-) ~~-15^0~~
~~BB~~ backward angle
HAND -50^0 15 m no lead wall
Trigger : T3, T4,T7,T9
Software: HAND calibrartion
HAND HRS_L coinc

Establish a HRS_L HAND coinc trigger (T9)

Calibrate HAND TOF (align time of all counters)

HAND commission and Calibration H(e,e'p) Kin D1

~1 GeV/c protons

Experts needed: HAND

Check calibrate of HAND & veto HV/gain/threshold using the known momentum (~1 GeV / c incident) energy deposit.

Remove HAND out of the way

(can that be done on Saturday) ?

HAND commission 2

Need to check angular coverage

At 15 m the coverage is only +-0.8 meter

Options:

1. Increase the distance (Max is?)
2. Two measurements at different heights
3. Cover only the central part of the detector

Saturday 12 Feb 2010

Swing 4PM – mid night

Change polarity HRS_L

Calibration of HRSs with coincidence H(e,e'p)
e-rigth p-left

Kinematics ?

Change polarity HRS_R and HRS_L

Calibration of HRSs with coincidence H(e,e'p)
p-rigth e-left

Kinematics G2

Q: do we realy need that ?

Beam: 2 pass
Traget: H
Detectors:
HRS_L (-) 33.7^0,1.610
HRS_R (+) -44.060,1.284
BB- back angle
~~HAND~~ –backward angle
Trigger : T1, T2,T3,T4, T5
Software: HRS coinc

Changing polarity of HRS_R is slower than HRS_L

Sunday 13 Feb 2010

Owl mid night – 8 AM

Move HAND out of the way
Move HRS(L) to 12.5^0 momentum 2.1397 (A4)
No sieve slits.

Beam: 2 pass
Target : C
Detectors:
HRS_L (-) 12.5^0
~~HRS_R (-) -15^0~~
BB- -68^0
~~HAND – out of the way~~
Trigger : T3, T4,T6,T8
Software: BB singles calibrartion
BB HRS_L coinc

Commission BB with singles C (T6)

Verify all elements are working
check timing for BB E & WC
Do pedestal runs, log pedestal values in DB,
Set dE and E HV by dE vs E "punch through" point.
Set dE E thresholds.
Set Wire Chambers HV and thresholds (use E dE ADC for proton momentum reference)
T8

Experts needed: BB experts

Sunday 13 Feb 2010

Day 8AM - 4PM

Continue Commission BB with singles C (T6)

Beam: 2 pass
Target : C
Detectors:
HRS_L (-) 12.5^0
~~HRS_R (-) -15^0~~
BB- -68^0
~~HAND –~~out of the way
Trigger : T3, T4,T6,T8
Software: BB singles calibrartion
BB HRS_L coinc

Sunday 13 Feb 2010

Swing 4PM – mid night

Establish a HRS_L BB coincidence trigger T8

Experts needed: trigger electronics

Beam: 2 pass
Tragets: H/C
Detectors:
HRS_L (-) 12.5^0-15^0
~~HRS_R~~ (-) -15^0
BB- -68^0 ->65.5^0
~~HAND~~ –out of the way
Trigger : T3, T4,T6,T8
Software: BB singles calibrartion
BB HRS_L coinc

Calibration of BB with H(e,e'p) Kin A4-A5

(BigBite Sieve slit IN/OUT && magnet off run)

Full acceptance BB optics of BigBite C (e,e'p) and C (e,p)

run kinematics B1-B4 (BigBite Sieve slit IN/OUT && magnet off run)

BB commission 3

Monday 14 Feb 2010

Owl mid night – 8 AM

Global picture

commission

02/14/11	Monday	1.1	Commission	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/15/11	Tuesday	1.1	Commission	1.162/80	TPE	5.562/50	Qweak	1.162/150/p

Pass 1 H / Solid targets

Goals :

Complete the commission and optics of HRSs , BB , and n-array with the 1 pass beam

Total 5 shifts

1 shift BB momentum scan

2 shifts HRS optics

Monday 15 Feb 2010

Day 8AM - 4PM

Change from 2 pass to 1 pass

Beam study 1 pas

(spot++ /, beam characteristics, charge monitors)

Hydrogen target

Continue Calibration of BB with H(e,e'p) Kin A1-A3

Beam: 2 pass
Target: H
Detectors:
HRS_L (-) 15^0
HRS_R (-) 15^0
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T7)
Software: HRS singles
special HAND "E/DE"
calibration code

Monday 15 Feb 2010

Swing 4PM – mid night

HRSs OPTICS

C(e,e') singles without / with sieve slits

Kin H1-H5

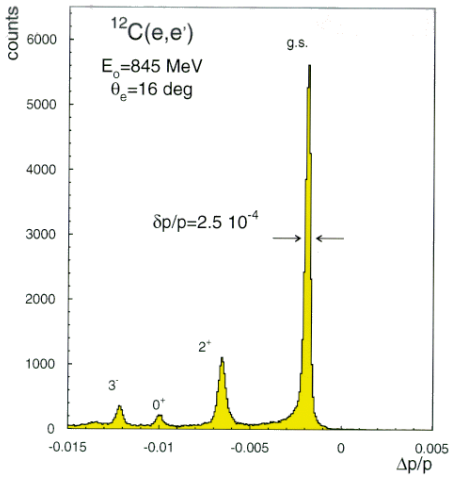
Momentum scan 4%, 2%,0,-2%,4%

Total 10 measurements 250,000 events each

C(e,e') singles multi foils

In parallel (parazitic mode): check HAND, BB all elements work fine.

Beam: 1 pass
Target: H
Detectors:
HRS_L (-) 15^0
HRS_R (-) -15^0
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T6,T7)
Software: HRS singles
special HAND "E/DE"
calibration code



If first pass is available or we can get it, we should take the following data on both HRS's in negative polarity with and without sieve slits:

12C(e,e') HRS(L) and HRS(R)
Ein = 1162 MeV

P(e')	Theta_L(e')	Theta_R(e')
1204.2	15.0	-15.0
1181.1	15.0	-15.0
1157.9	15.0	-15.0
1134.7	15.0	-15.0
1111.6	15.0	-15.0

Tuesday 15 Feb 2010

Owl mid night – 8 AM

HRSs calibration

C(e,e') singles without / with sieve slits

QE Kin ??

Momentum scan 4%, 2%,0,-2%,4%

Total 10 measurements

C(e,e') singles multi foils

Beam: 1 pass
Target: C
Detectors:
HRS_L (-) 15^0
HRS_R (-) -15^0
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T6,T7)
Software: HRS singles
special HAND "E/DE"
calibration code

Tuesday 15 Feb 2010

Day 8AM - 4PM

Beam: 2 pass

Detectors:
HRS_L (-) 15^0
HRS_R (-) 15^0
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T7)
Software: HRS singles
special HAND “E/DE”
calibration code

Tuesday 15Feb 2010

Swing 4PM – mid night

Beam: 2 pass

Detectors:
HRS_L (-) 15^0
HRS_R (-) 15^0
BB- back angle
HAND -50^0 15 m
Trigger : T1, T2,T3,T4, (T7)
Software: HRS singles
special HAND “E/DE”
calibration code

Global picture

N Delta production Pass 1 H / Solid targets

02/16/11	Wednesday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/17/11	Thursday	1.1	N-Delta	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/18/11	Friday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/19/11	Saturday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/20/11	Sunday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/21/11	Monday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/22/11	Tuesday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/23/11	Wednesday	1.1	E08-010	1.162/80	TPE	5.562/50	Qweak	1.162/150/p
02/24/11	Thursday	1.1	Target Change		TPE	5.562/50	Qweak	1.162/150/p

HRSe	HRSh
12.52°	24.50°
12.52°	12.52°
12.52°	36.48°
12.96°	21.08°
19.14°	29.37°
19.14°	14.99°
19.14°	43.74°
22.94°	30.86°
22.94°	20.68°
22.94°	41.03°
22.94°	12.52°
22.94°	49.19°
21.74°	37.31°
22.29°	34.06°

e- Rigth p Left

Questions:

1. What are the momenta?
2. Any special calibration needed except those listed above ?

Thursday 24 Feb 2010

Target change H→D

Install HAND and the lead wall behind BB

Comment: must be on a working day

Comment: If the run is to be end by end of March or a major Beam time/equipment availability we should skip the deutron run and calibration and start by looking for (e,epn) triple coincidence with a pass 4 beam 500 MeV/c kinematics

Global picture

D disintegration run

Pass 1 D / Solid targets

02/24/11	Thursday	1.1	Target Change		TPE	5.562/50	Qweak	1.162/150/p	
02/25/11	Friday	1.1	E08-008	3.362/100/p	HD Install		Qweak	1.162/150/p	
02/26/11	Saturday	1.1	D-Threshold	3.362/100/p	HD Install		Qweak	1.162/150/p	
02/27/11	Sunday	1.1	E08-008	3.362/100/p	HD Install		Qweak	1.162/150/p	
02/28/11	Monday	1.1	E08-008	3.362/100/p	HD Install		Qweak	1.162/150/p	
03/01/11	Tuesday	1.1	E08-008	3.362/100/p	HD Install		Qweak	1.162/150/p	
03/02/11	Wednesday	1.1	E08-008	3.362/100/p	HD Install		Qweak	1.162/150/p	

Global picture

SRC calibration with Deuteron Pass 2 D / Solid targets

03/03/11	Thursday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p
03/04/11	Friday	1.1	SRC	2.262/15/	HD Install		Qweak	1.162/150/p
03/05/11	Saturday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p
03/06/11	Sunday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p
03/07/11	Monday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p
03/08/11	Tuesday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p
03/09/11	Wednesday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p
03/10/11	Thursday	1.1	E07-006	2.262/15/	HD Install		Qweak	1.162/150/p

Check option to beam change pass 2 to 4 Saturday 5 March

Thursday 3 March 2010

Owl mid night – 8 AM

Establish a triple coincidence triggers

HAND neutron efficiency calibration d(e,e'pn) x<1

kinematics E1,E2 (250, 400 MeV/c)

12h beam 10,000 events E1
12h beam 3,000 events E2

Get HAND efficiency per n momentum
-Record/verify location of TOF peak of neutrons in HAND.
-Monitor target density/temperature during run. (can effect efficiency measurement).

Experts needed: trigger electronics experts

Beam: 2 pass
Target: D
Detectors:
HRS_L (+) 59.2^0 ,0.7787,
51.9^0 0.9858
HRS_R (-) -12.5^0/1.9487
-12.5^0/1.7579
~~BB- -99^0~~
HAND -100^0 with lead wall
Trigger : T1,T2,T3, T4,T5
Software: HRS n-array

Thursday 3 March 2010 Friday 4 March 2010

Day 8AM - 4PM → Owl mid night – 8 AM

2 days are needed for the n efficiency

Beam: 2 pass
Target: D
Detectors:
HRS_L (+) 59.2^0 ,0.7787,
51.9^0 0.9858
HRS_R (-) -12.5^0/1.9487
-12.5^0/1.7579
~~BB- -99^0~~
HAND -100^0 with lead wall
Trigger : T1,T2,T3, T4,T5
Software: HRS n-array

Check option to replace the x<1 neutron detection efficiency and the triple coincidence check with low Q2 d (e,e'pn)

or

Pass 2:

$E = 2.258$
$E' = 2.00$
$\theta_e = 19$
$p_p = 517$
$\theta p = -18.8$
$p_r = 500$
$\theta_r = 104$
$Q^2 = 0.49$
$x = 1.01$

Pass 3:

$E = 3.356$
$E' = 3.00$
$\theta_e = 19$
$p_p = 607$
$\theta p = -18.1$
$p_r = 600$
$\theta_r = 101.6$
$Q^2 = 0.68$
$x = 1.03$

Run also C or 4He t get (e,e'pp) triple coincidence events

Saturday 5 March 2010

Day 8AM - 4PM

Energy change 2 pass to 4 pass.

Do beam study (spot++ / beam characteristics, charge monitors)

Beam: 4 pass
Target: D
Detectors:
HRS_L (-) 20.3^0 ,3.6094

HRS_R (+) -36.59^0/1.4275
-20.1^0/1.0993
BB- -99^0
HAND -100^0 with lead wall
Trigger : all
Software: production

HRSs Polarity change

Switch the polarity of HRSs to HRSL(-) and HRSR(+).
-set coincidence time, calculate where is the new neutron TOF peak.

Experts needed: trigger electronics experts

Watch time changes due to HRS L/R changes

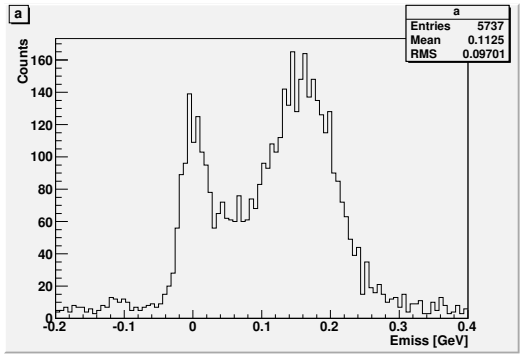
Check HRSs coincidence with d(e,e'p) x>1, low Pmiss

Kin K6

Check HRSs coincidence with c(e,e'p) x=1, parlel kin

With / without sieve slits , multi foil , delta scan

Kin ?



E01-015: LD2 ~2Hrs

Saturday 5 March 2010

Swing 4PM – mid night

Untill

Monday 7 March 2010

Owl mid night – 8 AM

Beam: 4 pass
Target: D
Detectors:
HRS_L (-) 20.3^0 ,3.6094

HRS_R (-) -36.59^0/1.4275
-20.1^0/1.0993
BB- -99^0
HAND -100^0 with lead wall
Trigger : all
Software: production

Last step before production: d(e,e'pn) x>1

kinematics K2

Get HAND efficiency per n momentum

-Verify location of TOF peak of neutrons in HAND

.

-Monitor target density/temperature during run. (can effect efficiency measurement).

Run for 2 calendar days, Q=1 C - expected ~100 events in the d(e,e'pn) TOF peak

Should be able to identify TOF peak after a day with ~40 events

Tuesday 7 March 2010

Day 8AM - 4PM

Swing 4PM – mid night

Change D to 4He

Start production

Beam: 4 pass
Target: D
Detectors:
HRS_L (-) 20.3^0 ,3.6094

HRS_R (-) -36.59^0/1.4275
-20.1^0/1.0993
BB- -99^0
HAND -100^0 with lead wall
Trigger : all
Software: production

Instrumentation Request List for Experiment E07-006

Trigger/DAQ

T1 single HRS_R
T2 inefficiency HRS_R
T3 single HRS_L
T4 inefficiency HRS_L
T5 coinc HRS_L HRS_R
T6 singles BB
T7 singles NA
T8 coinc HRS-L (BB + NA)

triggers, apperntlly, T9->T12 canot be prescaled (need to check again),
so if we want HRSL*X, we can consider -
*T8 = HRSL * (BB + HAND)