SANE Readiness Review Response

- Report indicates no serious issues
  - "Collaboration is making significant progress in making the components of the experiment ready to be installed in May 2008" (from **Summary**)
- Report identifies 12 areas for comments:
  1. Physics goals
  2. Beam Line
  3. Radiation shielding
  4. Target
  5. BigCal
  6. Cherenkov
  7. Hodoscopes
  8. Software
  9. Detector infrastructure
  10. Installation
  11. General Organization
  12. Manpower
- Report labels
  - potential issues: solid bullets ●
  - other recommendations: open symbols ○
- **Added: names in charge / invited**

1. Physics goals

- Report comment
  - BigCal calibration and resolution consistent with goals
    - Basic answer: proposal Table 2 (based on $5\% / \sqrt{E'}$ resolution).
   - (Further study: O. Rondon, G. Huber)

Table 2

E' GeV	x	W GeV	$\delta\theta$ mr	$\delta E'$ GeV	δx	δQ^2 GeV/c²	δW GeV
			$E = 6$ GeV				
1	0.3	2.73	10.1	0.050	0.024	0.160	0.045
1.7	0.59	2.04	4.5	0.085	0.035	0.196	0.076
2.2	0.87	1.35	2.9	0.110	0.048	0.214	0.130
			$E = 4.8$ GeV				
0.8	0.24	2.57	17	0.040	0.028	0.131	0.039
1.4	0.49	2.03	5.9	0.070	0.034	0.143	0.061
1.9	0.78	1.43	3.9	0.095	0.050	0.162	0.100

1. Physics goals (II)

- Report comment

  - BigCal calibration and resolution consistent with goals

  - Further study (G. Huber):

  - Amplitude distributions for *ep* elastic signals show

    - 5% sigma (resolution)

    - < ~1% error of means

    - 10-20 MeV accuracy for *E'* 1 to 2 GeV (HMS offset included)

  - π^0 mass reconstruction error ~ 10 MeV

400 counts
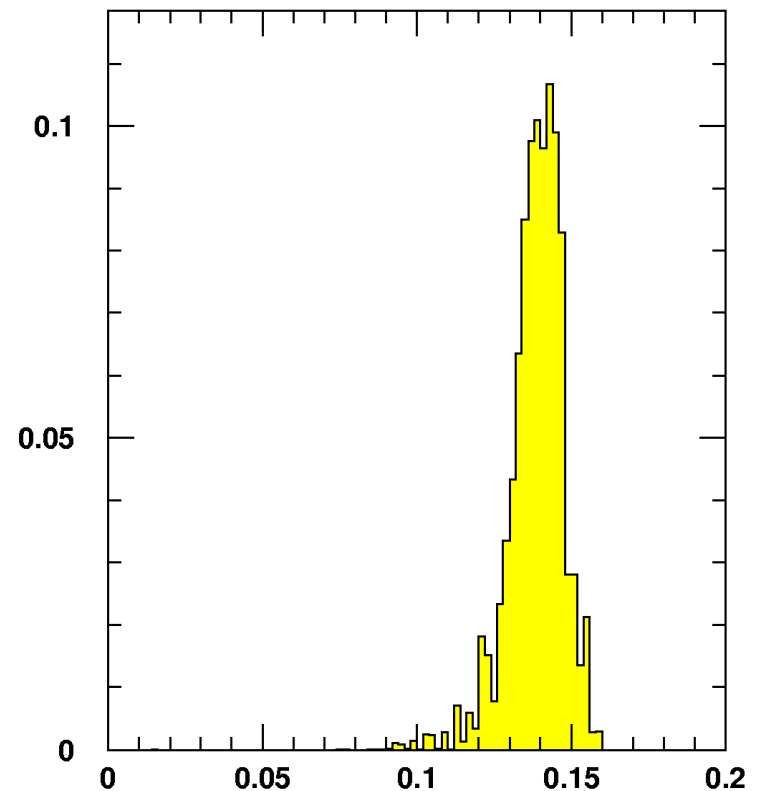Mean = 1281±4
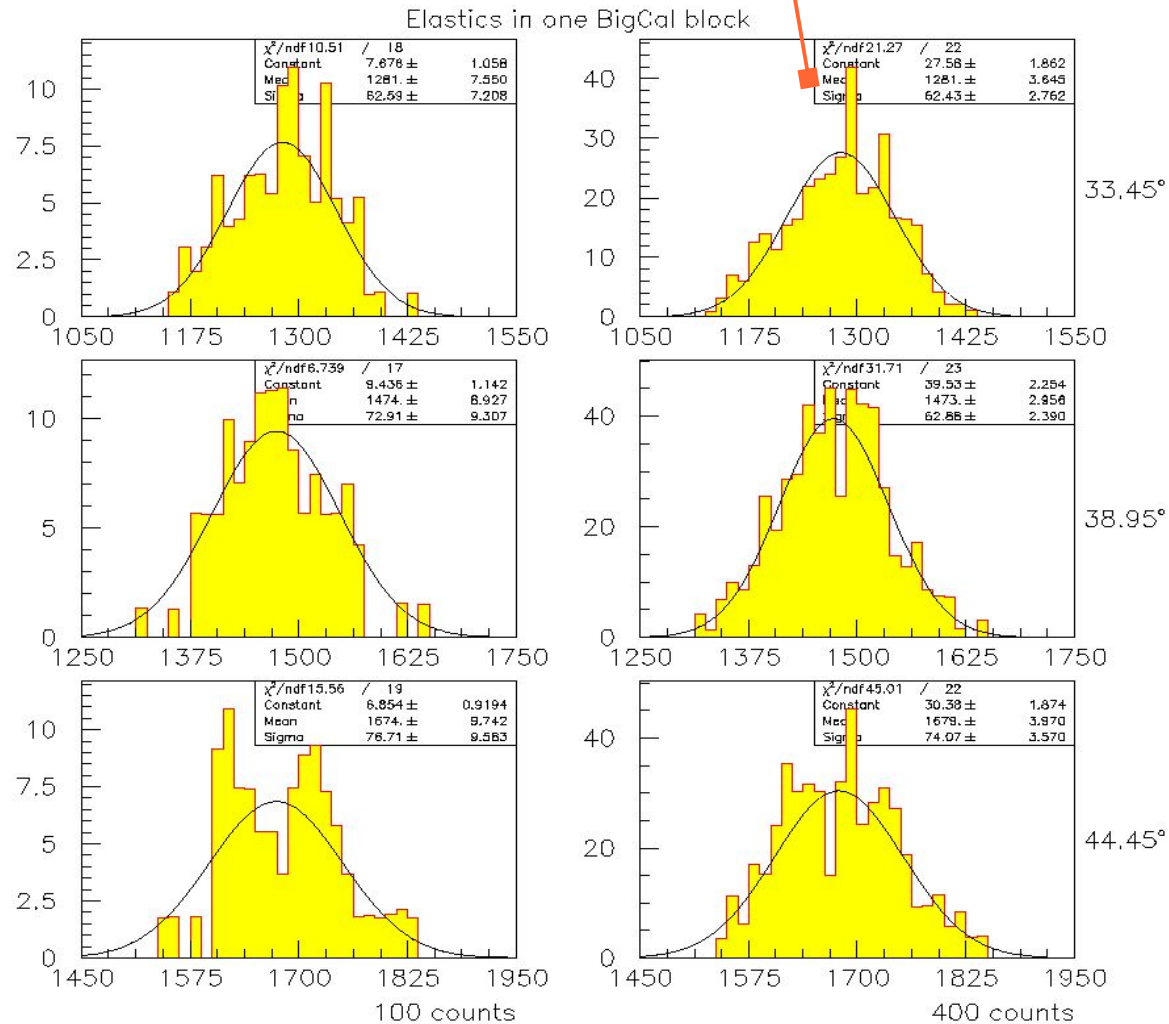
1. Physics goals (III)

- Report comment

  - BigCal calibration and resolution consistent with goals

  - Further study (G. Huber):

  - Amplitude distributions for *ep* elastic signals show

    - 5% sigma (resolution)

    - < ~1% error of means

    - 10-20 MeV accuracy for E' 1 to 2 GeV (HMS offset included)

  - π^0 mass reconstruction error ~ 10 MeV

Reconstructed Mass of Two Neutral Cluster Events

1. Physics goals (IV)

- Report comment
  - BigCal calibration and resolution consistent with goals
    - Expected systematic errors seem consistent with the previous results

Point to point systematics

	A1p		g2	
	x=0.3	x=0.6	x=0.3	x=0.6
*R***	0.8%	1.2%	1.5%	1.3%
Kinematics	0.4%	0.5%	2.7%	4.5%
Background	1.0%	1.0%	3.7%	1.8%
Local	2.1%	2.3%	4.0%	4.1%
Global	3.3%	3.3%	4.6%	4.7%
Total	4.2%	4.0%	6.8%	6.7%

Systematics for 4.8 GeV are very similar

** Using new fit for R from Hall C will improve on these estimates

2. Beam line

- Report comments

J. Dunne {
  - Low current diagnostics to track beam from target to dump
  - SEM output on EPICS for MCC
  - Additional FSD protection for total beam I, chicane, rasters and downstream
}

P. Bosted
  - TOSP for hall access including the Hodoscope and target platform

F. Wesselmann
  - Check of SEM in "noisy" hall to add cable shielding if needed
  - Maximum energy in range 5.6 to 6.0 GeV. Collaboration should provide optimal points for maximizing polarization in all Halls

O. Rondon
    - Response given during review:
        - Collaboration only requests beam energies. Scheduling committee in charge of coordinating requirements from halls
    - Additional response: beam energy after July 2008 >= 5.714 GeV
    - Energy request summarized in J. Dunne's report

2. Beam line (II)

- **Report comments**
  - Maximum energy in range 5.6 to 6.0 GeV. Collaboration should provide optimal points for maximizing polarization in all Halls

  O. Rondon

  - Questions about Spin Rotation calculator:
    - unexpected Hall B |100 %| polarization above 1117.5 MeV linac
    - launch angle value changes from "Magic energies" page to "Rotation" page.
    - "Minimal pain" value sometimes unexpectedly worse for all halls than true optimum
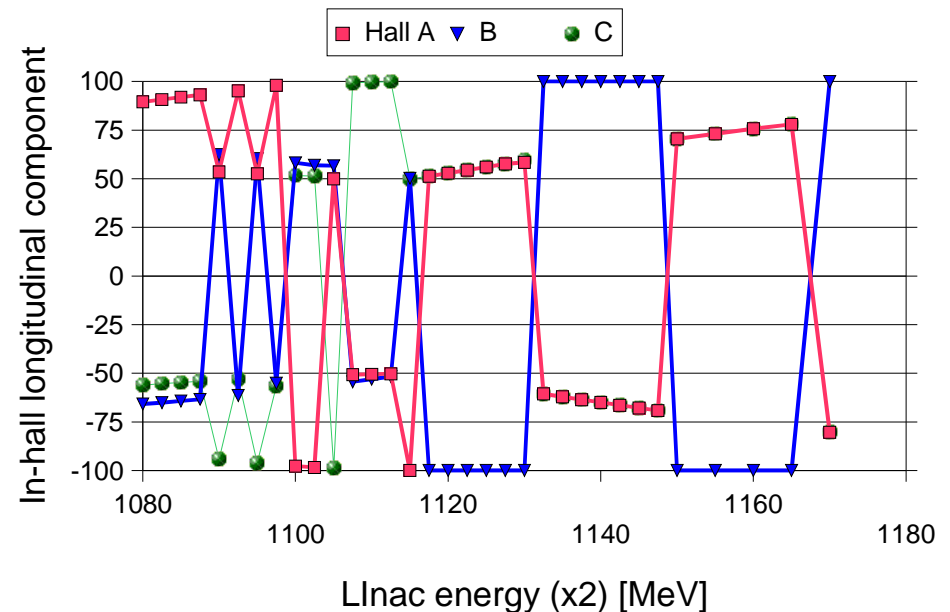
3. Radiation Shielding

- Report comments
  - Shield lead bricks must be in cassettes
  - Special shield support platforms need to be designed with attention to interference and strength
  - Platform dimensions and locations need to be provided to Hall designers timely
  - Detector shielding should be optimized before BigCal's calibration
  - (Seoul National U. - S. Choi and H. Kang - Seonho will be at JLab full time starting August 28)

4. Target

- Report comments
  - Target operator training of 9 additional operators needs to identify operators and training plan
  - Target cups easy to replace, made of hydrogen-free plastics (e.g. no Torlon)
  - (D.Crabb, D.Day, K.Slifer)

5. BigCal

- Report comments
    - Quantitative justification of glass anneal
        - if needed, manpower requirements must be determined
        - less intrusive anneal (no PMT removal) should be investigated
    - Magnetic shielding needs careful calculation
    - Detector response needs to be measured for range of residual fields, field orientations
    - Calibration with π^0 mass reconstruction turn-around time (from data collection to analysis to results) needs to be estimated, special trigger should be configured if needed.

M. Jones

D. Day,
J. Mulholland
J. Maxwell

P. Bosted,
UVA, ...

6. Cherenkov

- Report comments
  - Fall '07 tests need improved coordination with GEp-III collaboration
    - (Z. Meziani, P. Bosted, M. Jones)

7. Hodoscopes

- Report comments
    - Effectiveness of magnetic shields need to be demonstrated with calculations or measurements
        - (M. Khandaker, A. Ahmidouch)
    - Abdellah had to cancel at last minute. He is working with P. Brindza on magnetic shielding box.

8. Software

- Report comments
  - Crucial to have working code for BigCal e^-p and π^0 calibrations before the experiment starts
    - Calibration - U. Regina (pending response), other research associates invited.
    - Simulation: Switching to GEANT4
      - J. Maxwell (UVA), W. Armstrong (Temple), H. Kang (Seoul)
    - On-line
      - H. Bagdasaryan (UVA, from 11/07)

9. Installation

- Report comments
    - Detailed installation plan needs to be developed
        - (O. Rondon, S. Wood, W. Kellner, M. Seely, D. Crabb, K. Slifer, M. Jones, Z-E. Meziani, S. Choi, ...)

10. Detector infrastructure

- Report comments
    - Proper timing of detector elements and ADC gate needs to be demonstrated
        - (?)

11. General organization and 12. Manpower

- Report comments
    - Physics liaison recommended (P. Bosted is PDL)
    - Increased participation of post-doctoral research associates
        - Focus on software (simulation and on-line)
            - Online
                - F. Wesselmann will maintain analysis engine
                - H. Bagdasaryan (UVa) will work on on-line code starting 11/07
            - others ?
        - Other projects, e.g. item 10. ADC gate timing

SANE Manpower: Collaboration

Initial	Name	Institution
J.	Jourdan	BASEL
M.	Kotulla	BASEL
I.	Sick	BASEL
E.	Brash	CNU
E.	Jensen	CNU
A.	Marsh	CNU
W.	Boeglin	FIU
S.	Dhamija	FIU
P.	Markowitz	FIU
J.	Reinhold	FIU
I.	Albayrak	Hampton
E.	Christy	Hampton
C.	Keppel	Hampton
V.	Tvaskis	Hampton
P.	Bosted	JLab
J.-P.	Chen	JLab
V.	Dharmawardarne	JLab
R.	Ent	JLab
D.	Gaskell	JLab
J.	Gomez	JLab
D.	Higinbotham	JLab
T.	Horn	JLab
M.	Jones	JLab
D.	Mack	JLab
G.	Smith	JLab
B.	Wojtsekhowski	JLab
S.	Wood	JLab

Initial	Name	Institution
J.	Dunne	MSU
A.	Ahmidouch	NCAT
S.	Danagoulian	NCAT
C.	James	NCAT
M.	Jones	NCAT
S.	Vilayoung	NCAT
M.	Khandaker	NSU
F.	Wesselmann	NSU
P.M.	King	Ohio
J.	Roche	Ohio
A.M.	Davidenko	Protvino
Y.M.	Goncharenko	Protvino
V.I.	Kravtsov	Protvino
Y.M.	Melnik	Protvino
V.V.	Mochalov	Protvino
A.	Vasiliev	Protvino
C.	Butuceanu	Regina
G.	Huber	Regina
V.	Kubarovsky	RPI
R.	Gilman	Rutgers
X.	Jiang	Rutgers
S.	Choi	Seoul
Ho-young	Kang	Seoul
Hyekoo	Kang	Seoul
Byungwuek	Lee	Seoul
Yoomin	Oh	Seoul
Jeongseog	Song	Seoul

Initial	Name	Institution
A.	Lukhanin	Temple
W.	Armstrong	Temple
Z.-E.	Meziani	Temple
B.	Sawatzky	Temple
M.	Bychkov	UVA
M.	Commisso	UVA
D.	Crabb	UVA
D.	Day	UVA
E.	Frlez	UVA
K.	Kovacs	UVA
N.	Liyanage	UVA
V.	Mamyan	UVA
J.	Maxwell	UVA
J.	Mulholland	UVA
D.	Pocanic	UVA
O.	Rondon	UVA
K.	Slifer	UVA
L.C.	Smith	UVA
L.	Pentchev	W&M
S.H.	Cowell	Witwatersrand
M.M.	Dalton	Witwatersrand
G.	Mbianda-Njencheu	Witwatersrand
A.	Asaturyan	Yerevan
A.	Mkrtchyan	Yerevan
H.	Mkrtchyan	Yerevan
V.	Tadevosyan	Yerevan

19 institutions - 77 confirmed names

2 PhD students - 2 MS students

SANE Manpower: Subsystems

Subsystem	Component	Manager	Experts	Institution
BigCal				
	Operation	L. Pentchev		William & Mary
			M. Jones	Hall C
			Protvino	Protvino
			Yerevan	Yerevan P. I.
	Trigger	R. Gilman		Rutgers U.
			X. Jiang	Rutgers U.
			P. Bosted	Hall C
	Gain Monitor	E. Frlez		UVA
	Calibration	G. Huber		U. Regina
			O. Rondon	UVA
Gas Cherenkov		Z-E. Meziani		Temple U.
			B. Sawatzky	Temple U.
			O. Lukhanin	Temple U.
Forward Tracking Hodoscope		M. Khandaker		Norfolk S.U.
			P. Bosted	Hall C
			C. Butuceanu	U. Regina
Lucite Hodoscope		A. Ahmidouch		North Carolina A&T S.U.
			S. Danagoulian	North Carolina A&T S.U.
Polarized Target		D.G. Crabb		UVA
			D.B. Day	UVA
			K. Slifer	UVA
			M. Seely	JLab
			C. Keith	JLab
			G. Smith	Hall C
Beam Line		J. Dunne		Mississippi State U.
	Raster		Chen Yan	Hall C
	BCM		D. Mack	Hall C
	Target BPM -SEM		M. Steinacher	Basel
			UVA	UVA
Shielding design		S. Choi		Seoul National U.
			H-Y.Kang	Seoul National U.
HMS		H. Mkrtchyan		Yerevan P. I.
			Yerevan	Yerevan P. I.
			Hall C	Hall C
			C. Keppel	Hampton
Moller		D. Gaskell		Hall C
			T. Horn	Hall C
BETA Simulation		J. Maxwell		UVA
			O. Rondon	UVA

Readiness Summary

Subsystem	Parts		Construction/Assembly		Tests		Preparation for SANE		
	In hand	On order/procurement	Prototype/design	Full	Lab	In Hall	Conditioning	Repairs	Other
BigCal	All			Ready	Completed	Fall '07	UV Glass anneal		
Gain Monitor		Lucite plate	Tested	Fall '07	Completed	Fall '07	Visual inspection	Plate change (?)	
Cherenkov	Tank, PMT's, Mirrors (arrive from CERN Jul. 07)	readout electronics	Tested	Sept. 07	July-Aug. 07	Fall '07			Alignment
Lucite tracker	prototype bars	arrive end of July 07	Tested	Aug.-Dec. 07	Jan.-Feb. 08	Spring 08			Alignment
Forward tracker	All		Tested	July-Sept.07		Fall '07			Alignment
Target	Magnet, refrigerator, microwaves, NMR, pumps, ammonia	OVC Can, inserts		Oct '07	Nov. -Dec. 07	June '08			Installation June '08
Target platform	GEn-01/RSS platforms			June '08					Preinstall pumps, control platform Jan-Feb. '08
Beam line	Upstream girder/chicane, rasters, BCM's, BPM's, SEM (ready at Basel)	Downstream extension & He Bag: Design complete Aug. 07; Order in Fall 07		June '08	Slow raster: Summer 07; Check low current BPM's	June '08			Preinstall in-hall dump Jan-Feb. 08
Beam line shielding		Simulations/Design completed Aug. '07 Order in Fall 07		June '08					Installation
HMS						June '08	Restore standard package		Cosmic tests
Trigger/DAQ	All BigCal modules, Cherenkov will use spare	HKS programmable logic as backup		Fall '07		Fall '07			
Online reconstruction	BETA simulation		Track reconstruction	Feb. '08	March-May 08	June '08			