

Transversity Prepration Overview

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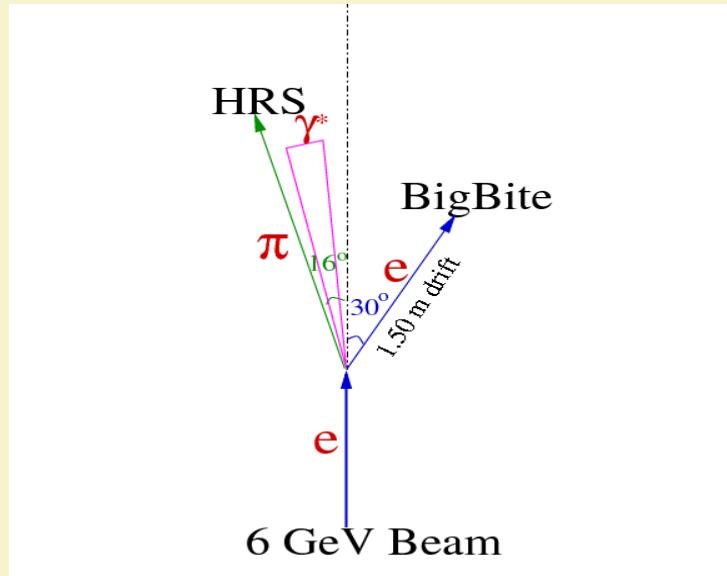
University of Kentucky

On behalf of the Hall-A transversity collaboration

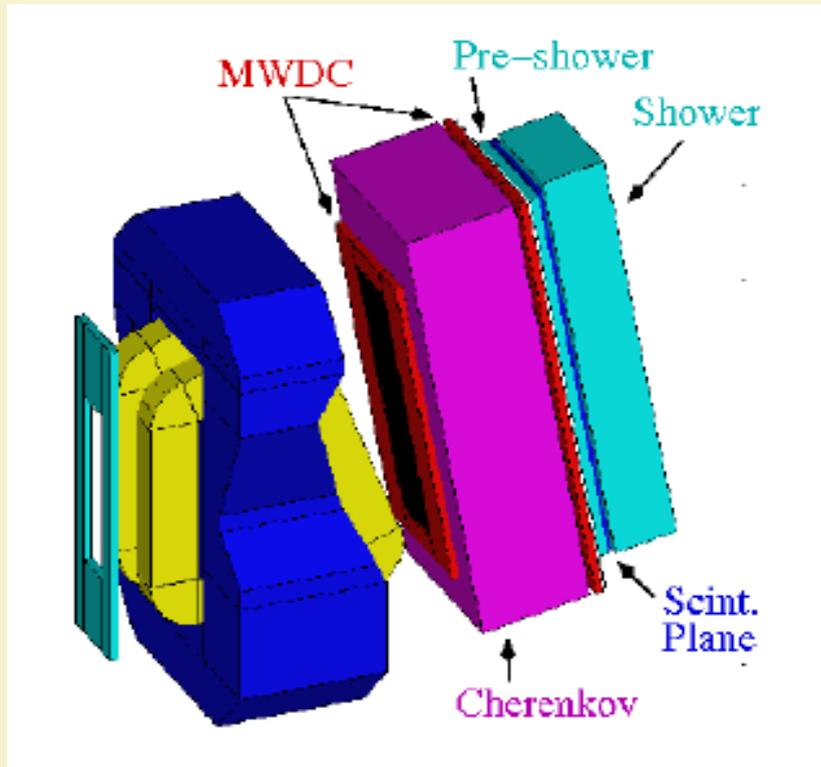
Hall A Collaboration Meeting. June 21, 2007

Hall-A Transversity Experiment

- Measures the target SSA in semi-inclusive DIS $n^\uparrow(e, e'\pi^\pm)X$ reaction.
- On transversely polarized ^3He target.
- Probes valence quark region: $x = 0.13 - 0.41$, at $Q^2 = 1.31 - 3.1\text{GeV}^2$.
- Detects pions in L-HRS in coincidence with e^- s in the BigBite detector.



BigBite Detector: e-Arm configuration



(picture from B.Sawatzky's slides)

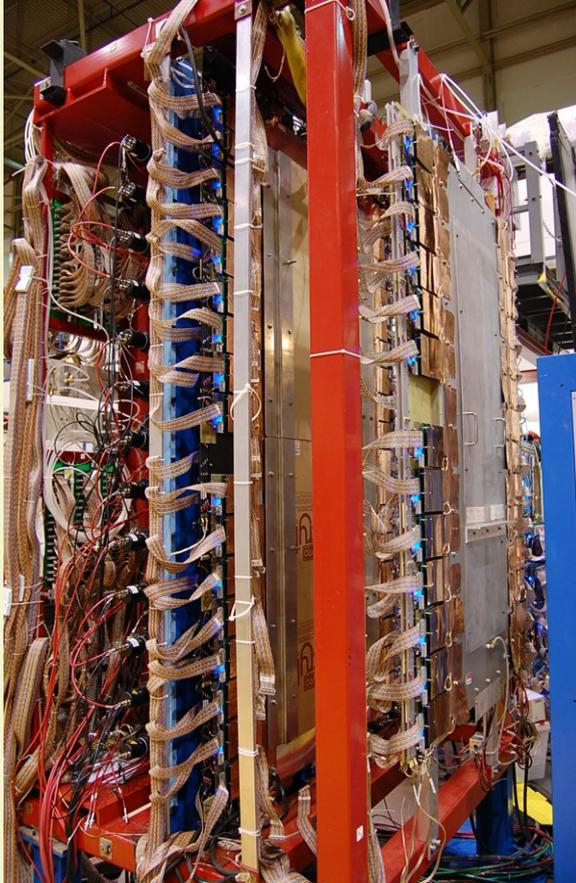
Progress on BigBite detector testing(since Jan07)

Wirechambers Test

- Cabling is done - many broken cables have been fixed.
- Chamber 1 and 3 have been tested - no major problem found!
- Chamber 2 is being upgraded to a full(6 planes) chamber at UVA (Nilanga)
- Once back on-site, it will be tested along with chamber 1 and 3.

(more details in X.Qian's talk)

Wirechambers Setup



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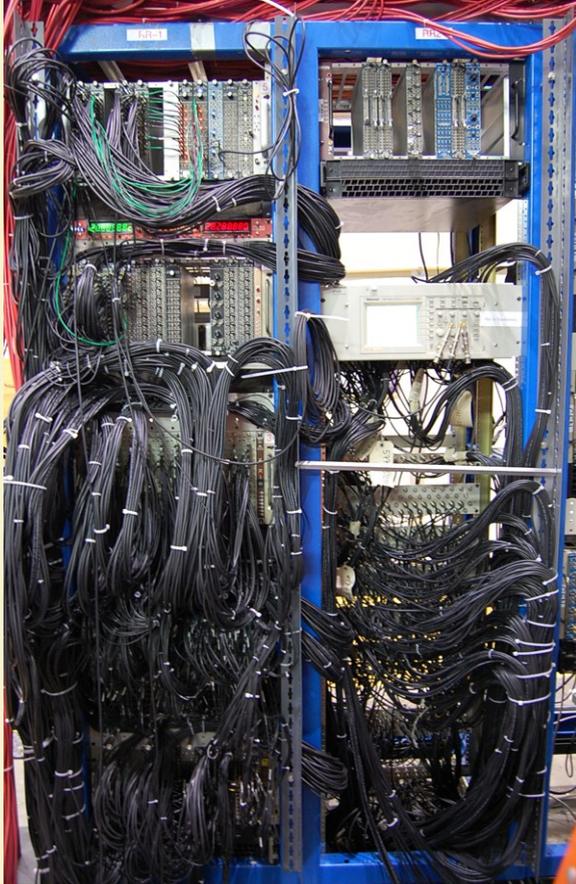
Gas Cherenkov/RICH/A1

- Provides additional PID combined with preshower+shower.
- All designs have been finalized.
- Fully funded
- Parts on-site by end of August, assembly/testing by 1st Oct.
- A working gas cherenkov will be integrated into the BigBite detector package.

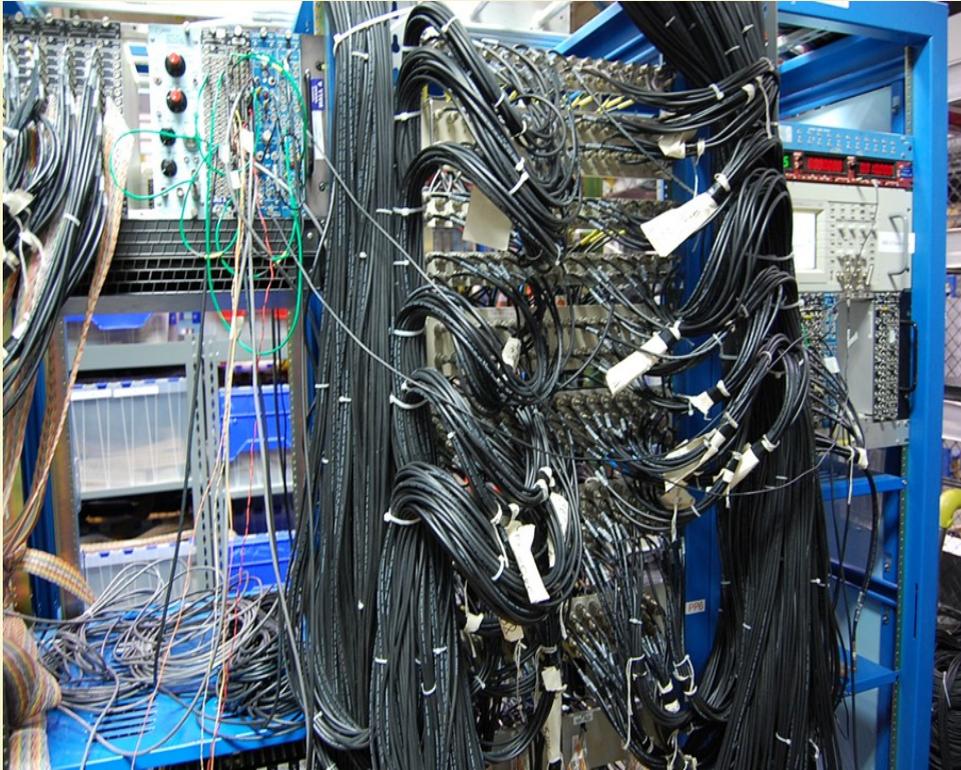
(more details in H.Yao's talk)

- RICH detector is on track (INFN)
- A1 detector tested: working fine. (P.Markowitz, Florida group)

DAQ Setup



DAQ Setup



cont'd..

Scintillator/Preshower/Shower Test

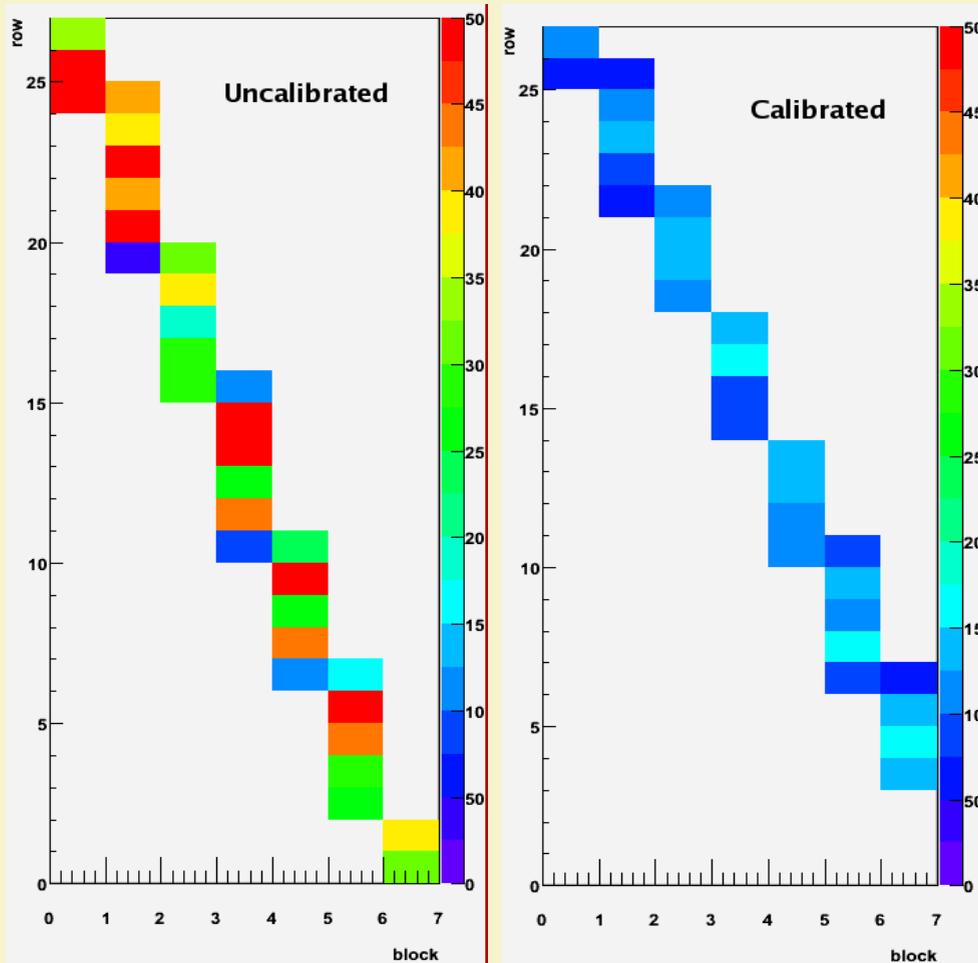
- Cabling for the detector is completed.(both HV and signal)
- Scintillator and preshower blocks have been tested.
- All 13 scintillators are in good condition.
- Most of the PMTs on the preshower blocks show after pulsing - All 54 modules are being refurbished with new PMTs. (Albert)
- Shower package was tested and calibrated with cosmics.
- Few modules(about 10) found to be bad(very high working voltage). They are being replaced with new PMTs.

Software/HV Control Tools

- Replay scripts
- Wire mapping for the chambers(1 and 3) and analysis scripts.
- Cosmic calibration software for the calorimeter.
- Event display for the chambers and calorimeter.
- High voltage control software - able to adjust HV with scripts.

(K.Allada, X.Qian)

Event display : Shower cosmic ray check



Trigger/DAQ Setup

- The DAQ is being setup in the testlab.
- Two VME crates for the wirechamber readout. (working)
- One FASTBUS crate for Scintillators, preshower and shower.(working)
- Two new FASTBUS crates along with the old one are being setup together with trigger supervisor. (work in progress)
- Flexibility to switch between FASTBUS and VME type in the Hall.

(Thanks to R.Michaels and B.Sawatzky)

Target Progress

- Polarization measurement of ^3He target: NMR and EPR
- Spin-flip was tested successfully with old oven.
- New oven for transversity is on site.
- NMR, EPR and spin-flip to be tested with new oven.
- Air inlet pipe broken - ordered new one.
- New software for NMR, EPR and spin-flip ready - need to test.
- Production of ^3He cells on track.
- Vertical coil is on site.

(more details in C.Dutta's talk)

Towards transversity...

Responsibilities

- BigBite detector testing on track.
- Wirechambers testing and tracking (X.Qian)
- Scintillators+preshower+shower test and trigger setup(K.Allada)
- Gas Cherenkov testing (H.Yao, B.Sawatzky)
- Target: NMR, EPR, spin-flip and other tests (C.Dutta, J.Katich, X.Zhan, Q.Yi)
- **Goal:** Complete all tests and ready to move in the Hall by Dec 2007.

Thanks to..

- W.Korsch
- R.Michaels
- X.Jiang
- B.Sawatzky
- N.Liyanage
- A.Shahinyan