

# Update on Big Bite Status

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# Big Bite History

- Built for NIKHEF
- Added scintillator planes for Short Range Correlations
- Wire chambers and calorimeter added for  $G_E^n$ .

# Recent History

- Two sets of detector packages for latest round of experiments
  - Electron package (3 wire chambers, gas Čerenkov, calorimeter)
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- Electron package used for Transversity,  $A_y$ , and  $d_2^n$
- Hadron package used for  $\pi^0$  and  ${}^3\overrightarrow{\text{He}}(\vec{e}, e'd)$

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- Returned Fastbus, VME, and HV crates to MIT
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- Hadron package will have MAD amplifier cards removed in May for APEX test run, and returned at the end of the run.

# Hadron Package Progress

- Created cosmic trigger using E-plane and temporary scintillator plane
- Connected gas system
  - Ran from January until March with Ar/CO<sub>2</sub> mixture
  - Recently switched to Ar/C<sub>2</sub>H<sub>6</sub> mixture
- Reconnected ROC 5 (with power supply modified for F1 TDCs)



# Requirements for 12GeV Experiments

- GEM trackers
- High Rate Timing Plane
- Improved Čerenkov Detector

## Prototype In Hall A Right Now

- Six GEM planes on-site for PREX experiment
- From last night's HALOG:  
*"We got the adapter to connect the GEM to the gassiplex, so we will try to put all chambers in tomorrow. Hall is scheduled to open around 9AM and close back at 4 PM."*

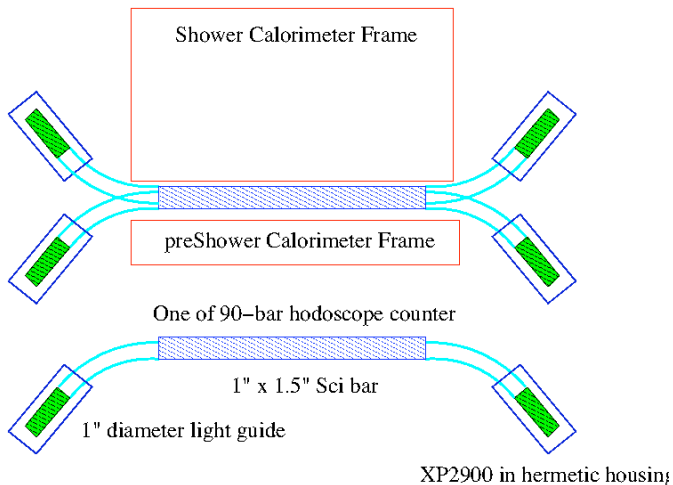
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  - Not a requirement for GEM's
  - Is required for ToF (e.g.,  $G_E^n$  and  $G_M^n$ )

# Concept



# Status

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- Requires more information before he can put together a proposal

# Improved Čerenkov Detector

## Current BigBite Čerenkov

- Problems at  $30^\circ$  for Transversity and commissioning
  - L-R discrepancy in S/N
  - 60% efficient for beamline side
  - $> 80\%$  efficient for far side
- Issues resolved at  $45^\circ$  for  $d_2^n$



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- Added shielding at  $30^\circ$  did not resolve issues
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  - The noise seems to be coming from inside the BigBite acceptance
  - Could be difference in cross-section over a wide acceptance
- Ideas are being considered, but a full re-design is needed for the requirements of the SuperBigBite experiments.

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- GEM tracker prototypes in Hall A right now
- Significant design work remains for improved timing plane and Čerenkov detectors