

BAND: Commissioning and calibration plans



Efrain Segarra, Florian Hauenstein, Jackson Pybus

BAND & Upcoming Schedule

RG-A: 8/22 - 11/25

- 11 GeV e- beam
- Liquid H₂ target

RG-K: 11/29 - 12/19

- 7.5 & 6.5 GeV e- beam
- Liquid H₂ target

BAND Reinstallation: 12/20 - 1/22

RG-B: 1/30 - 3/10 & 11/1 - 12/19

- 10.6 GeV e- beam
- Liquid D₂ target



Overview of Current BAND Status

- < 50% channels active
- In next days, readout with CLAS in production mode (already done with cosmics in CLAS)
- Cosmic triggering to perform calibrations
- Understand background rates from beam







- 1. Develop calibration & reconstruction software
- 2. Perform calibrations with cosmics
- 3. Continue developing laser system (see Jackson's talk)





BAND Slow Control

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10

20 30 40 50 60 70 80 90 100 110 DISC Channel

122



- BAND unique detector ID = 21
- Divided into <u>five</u> sectors, <u>five</u> layers (columns), elements (bar / paddle) and left/right







Online Monitor Suite



Online monitoring software & structure developed by Cole Smith





Calibration Software Suite



I'm currently developing BAND calibration suites using cosmic data

Settings TriggerBits											
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	Gain matching with ADC spectra										
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ay control	2	5	2	0.000	0.000	2.400	2.400	2.400	2.400		
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7 Emulation					Show						
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Other software requirements

Reconstruction algorithm (not started)

Geometry description for CLAS12 software (~50% done)

Integration to GEMC (not started)

Classes to store simulated hits to banks started





- Cosmic gain-match
- Left-right time shifts
- Speed-of-light map
- Attenuation lengths
- Time-walk correction / resolution
- Threshold determinations
- Neutron efficiency
- Time-of-flight (global time) calibration
- Re-scattering
- Background measurement

Need LD₂ for (e,e'pn) exclusive





Best we can do until laser system & neutrons from d(e,e'pn)

However, not the relevant energy range we want



Left-right time shift & speed-of-light











Re-scattering:











Re-scattering:



Hit pattern on BAND with an isotropic generator, n 250 MeV/c







Thank you



Software Status

- Focused on calibration suites
- Using cosmic data to benchmark

Upcoming

- Readout with CLAS
- Reinstallation in Dec Jan

