

# Run-Group-B Report

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CLAS Collaboration Meeting, 18 - 21 June 2019

## Run Group B: Overview

### **Electron Scattering off Unpolarized Deuteron**



E12-09-008B Boer-Mulders Asymmetry in Kaon SIDIS; A<sup>-</sup> (56 days)

$$\sigma_{UU}^{\cos 2\phi} \propto 2(1-y)\cos 2\phi \sum_{q,ar{q}} e_q^2 x h_1^{\perp q}(x) \otimes H_1^{\perp q}(z)$$

E12-07-104 Neutron Magnetic Form Factor; A<sup>-</sup> (30 days)



## Run Group B: Overview

### Electron Scattering off Unpolarized Deuteron



E12-11-003b

Study of  $J/\psi$  Photoproduction off Deuteron, RGB Proposal







### Spring-2019 Run, 7 Feb — 25 March

```
Target:
ρ = 0.163 g/cm<sup>3</sup> (23.6 K, 1200 mbar), unpolarized LD<sub>2</sub>
L = 5 cm, d = 2 cm
```



Trigger
RGA trigger without FT
at 50 nA: 13.5 kHz event rate

Inbending torus field for negatively-charged particles

 $\overline{P}_{av}(10.2 \text{ GeV}) = 87.5\%$  $\overline{P}_{av}(10.6 \text{ GeV}) = 85.7\%$ 

#### Spring-2019 Run, 7 Feb — 25 March

Summary

Collected Data

- 237 production runs (35 nA, 50 nA)
- low-current runs, empty-target runs
- 9.7 B events at 10.6 GeV, 11.7 B events at 10.2 GeV
- PAC days (according to ABUs: 21.8); \*significantly less for  $J/\psi$
- Data Processing Status
  - First round of preliminary calibrations completed: calibration runs: 6164, 6233, 6328, 6420, 6489, and 6515
  - PassO cooking mostly done with COATJAVA 5.9.0, hipo3
  - Ongoing pass0/v6 cooking done with COATJAVA 6b.2.0, hipo4
- Regular news, plans, reports
  - RGB meetings: Fridays, 8:30 am; JLab F224-225, BlueJeans ID: 237353330

### Example Timelines, pass0/v5



Electron Trigger changes: trig. v5: E<sub>ECAL</sub>+E<sub>PCAL</sub> > 250 MeV trig. v3: E<sub>ECAL</sub>+E<sub>PCAL</sub> > 300 MeV

### Example Timelines, pass0/v5



**Electron Trigger:** 

trig. v5: EECAL+EPCAL > 250 MeV

trig. v3: EECAL+EPCAL > 300 MeV

Muon Trigger:

trig. v3: 40 MeV < E<sub>ECAL</sub>; 10 MeV < E<sub>PCAL</sub>

trig. v2: 40 < E<sub>ECAL</sub> < 120 MeV; 10 < E<sub>PCAL</sub> < 60 MeV

### Run Group B Example Timelines, pass0/v5



#### Example Timelines, pass0/v5





FTOF Mass Distributions, Positively-charged tracks



### **Central Neutron Detector**

#### from Silvia

**RGB: neutron detectors performances** 



Backward-Angle Neutron Detector (BAND) Performance

from Florian

Events

•1 full day of running at 50 nA

•electrons in FD, DIS kinematics  $(Q^2 > 2 (GeV/c)^2 \text{ and } W > 2.2 GeV)$ 



Backward-Angle Neutron Detector (BAND) Analysis

from Florian

Events

•1 full day of running at 50 nA

•electrons in FD, DIS kinematics  $(Q^2 > 2 (GeV/c)^2 \text{ and } W > 2.2 GeV)$ 



### **nDVCS** Analysis

from Silvia

Event selection

- Runs 6164, 6215, 6240, 6289, 6310, 6489 (~2.5% of the whole spring run), COATJAVA 5.9.0
- PID: e'ny detected (EB)
- Kinematic cuts: Q<sup>2</sup>>1 GeV<sup>2</sup>, p(e')>1 GeV/c, θ(e')>5.5°, p(n)>0.35 GeV/c
- Preliminary «spectator» and «DVCS» cuts on IM<sub>X</sub>(ed→e'n<sub>Y</sub>X), missing energy, missing momentum,  $E_{Y}$ >2 GeV
- nDVCS+BH simulation: GENEPI + GEMC 4.3.0 + COATJAVA 5.9.0

#### from Silvia

### **nDVCS** Analysis



### **nDVCS** Analysis

#### from Silvia



### Upcoming in 2019

- New RGB Proposal submitted to PAC: Quasi-Real Photoproduction on Deuterium (F. Hauenstein, W. Phelps, S. Stepanyan)
  - proton-antiproton photoproduction off neutron
  - coherent di-hadron photoproduction off deuteron
  - remaining 69 days of RGB
  - modification of muon trigger
- RGB Fall Run
  - Scheduled 1 Nov 19 Dec 2019
  - Run Plan to be finalized in July.
    - Most likely will take some data with reversed torus field
    - Beam current no larger than 50 nA
    - Beam energy, hopefully > 10.2 GeV