INFN GEM – update

23/05/2019
GEM Commissioning
and SBS
Weekly Meetings
Test setup @JLab

Basically unchanged since Nov/2018
Latest Cosmic Runs (April/19) @JLab

- 4 runs at different HV: 4000 – 4100 – 4150 – 4200 (new), gas at ~1.5 V/h
- 350-400 kevents in each run
- First analysis on about ½ of the events, with old alignment coefficients
Nov/18: GEM Hit Map “reference”

White sectors have shorts; they cannot be recovered (as far as we know)

← upper / lower →
Apr/19: 4000 V

← upper / lower →

electronics and/or HV connection to sectors
Apr/19: 4100 V

electronics and/or HV connection to sectors
Apr/19: 4150 V

← upper / lower →

electronics and/or HV connection to sectors, temporarily recovered
Apr/19: 4200 V first ~150 kevents

electronics and/or HV connection to sectors

gas mixture not saturated yet

NOTE: Gas bottle replaced at 9:30, Run started around 10:30
Apr/19: 4200 V last ~150 kevents
← upper / lower →

electronics and/or HV connection to sectors

gas mixture now looks fine
4000 V
4100 V
4150 V
4200 first part (~150 kevents)
4200 second part (~150 kevents)
Apr/19: 4150 V - Residuals

← upper / lower →

RMS middle GEMs ~ 1 – 2 mm / side GEMs ~ 2 - 5 mm – No fine alignment!
Nov/18

Before alignment:

After software alignment:
Latest Cosmic Runs (April) at JLab

- 4 runs at different HV: 4000 – 4100 – **4150** – 4200 (new), gas at ~1.5 V/h
- 350-400 kevents in each run
- First analysis on about ½ of the events, with old alignment coefficients
  - very stable currents in all chambers
  - chamber response unchanged respect to Nov/2018 (as expected)
    - tracking efficiency approaches 90% for HV>4100 V
      - one unstable “row” need fixing in Module J3/2 (either electronics or HV connection)
- One digital HDMI long cable on J0M1X1 replaced (bad spectra in the histogram test)
GEM status/activity in Italy

- One GEM module tested (presented in March): stable GEM foils, noisy bunch of strips in readout plane
- One new GEM module under assembling (almost completed)
- By end of this week, three new GEM foils will complete the quality checks; if passed we will proceed to assemble one more GEM module
- Likely three new GEM modules (in total) by mid June available.
Short Term Plan

• Leonard Re arrived in JLab last week-end. Will stay about 1.5 Month (June/Mid July):
  - continue cosmic tests for characterization and fixing
  - take care of details for the installation in BigBite (expected after July)
• Tentatively:
  - mid July: bring new modules then replace the worst ones and optimally rearrange the others
  - beginning of August: installation in BigBite according to current BigBite plan (critical period for Italian Techs availability!)