

12-13/06/2019

INFN GEM Status

E. Cisbani

SBS Front Tracker GEM chambers:

<https://docs.google.com/document/d/1QWbZPQZJ9sGWcWRkJDHlxRwA0eFlcie8kyNKTMDKzTs/edit?usp=sharing>

Test setup @JLab (before May/19)



Unchanged from Nov/2018 to Apr/2019

Nov/18-Apr/19: GEM Hit Map

4000 V

x/y Chamber J0

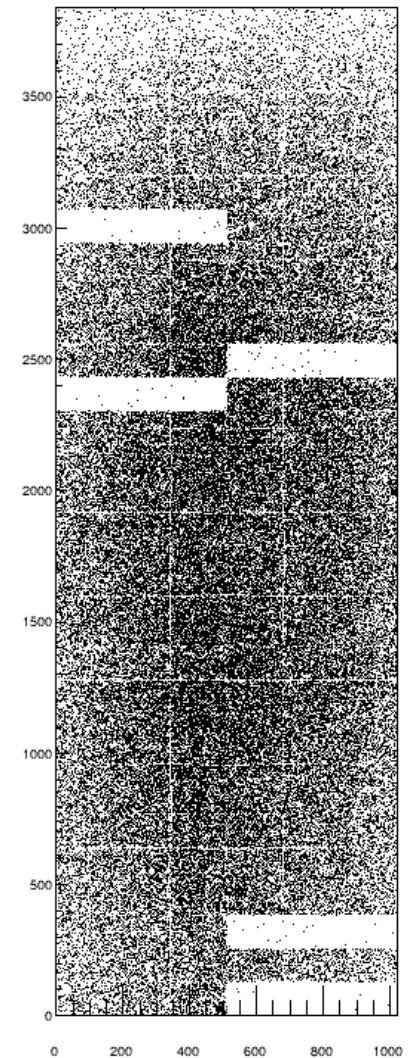
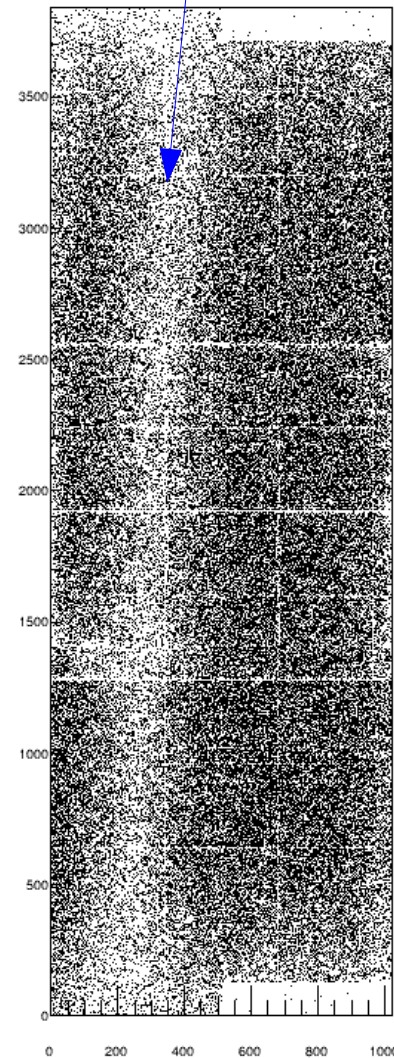
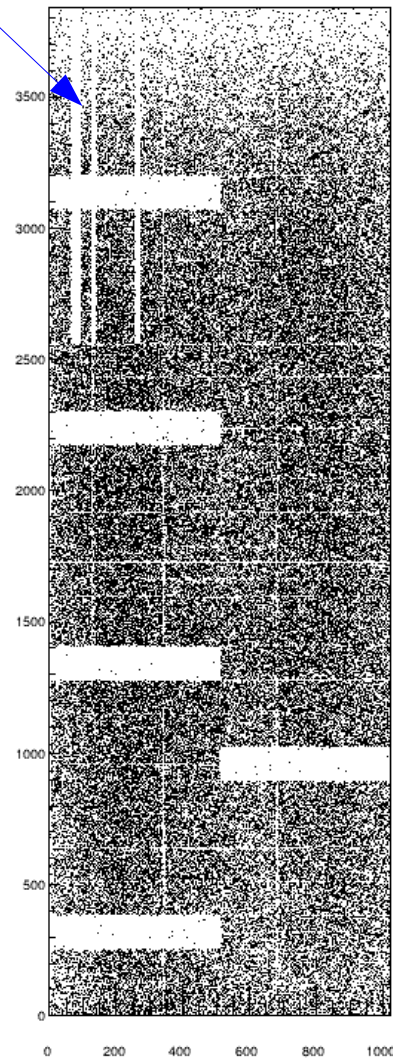
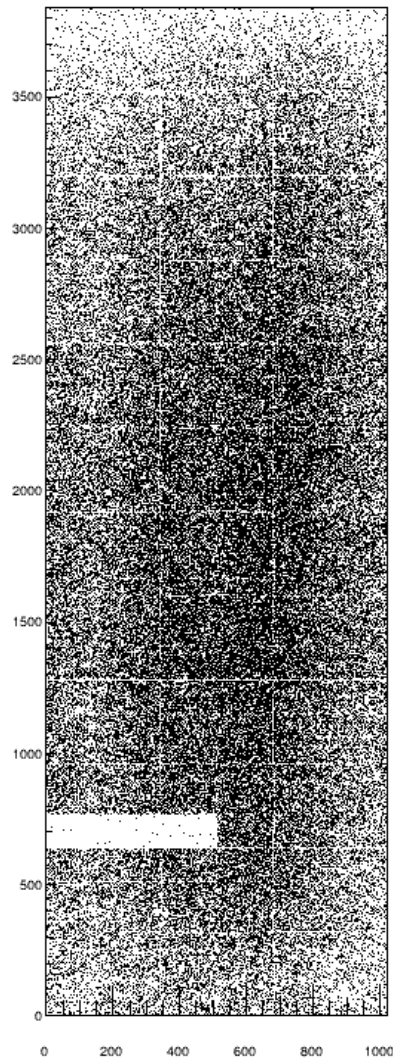
x/y Chamber J1

x/y Chamber J2

x/y Chamber J3

Strip paths likely damaged, need closer inspection

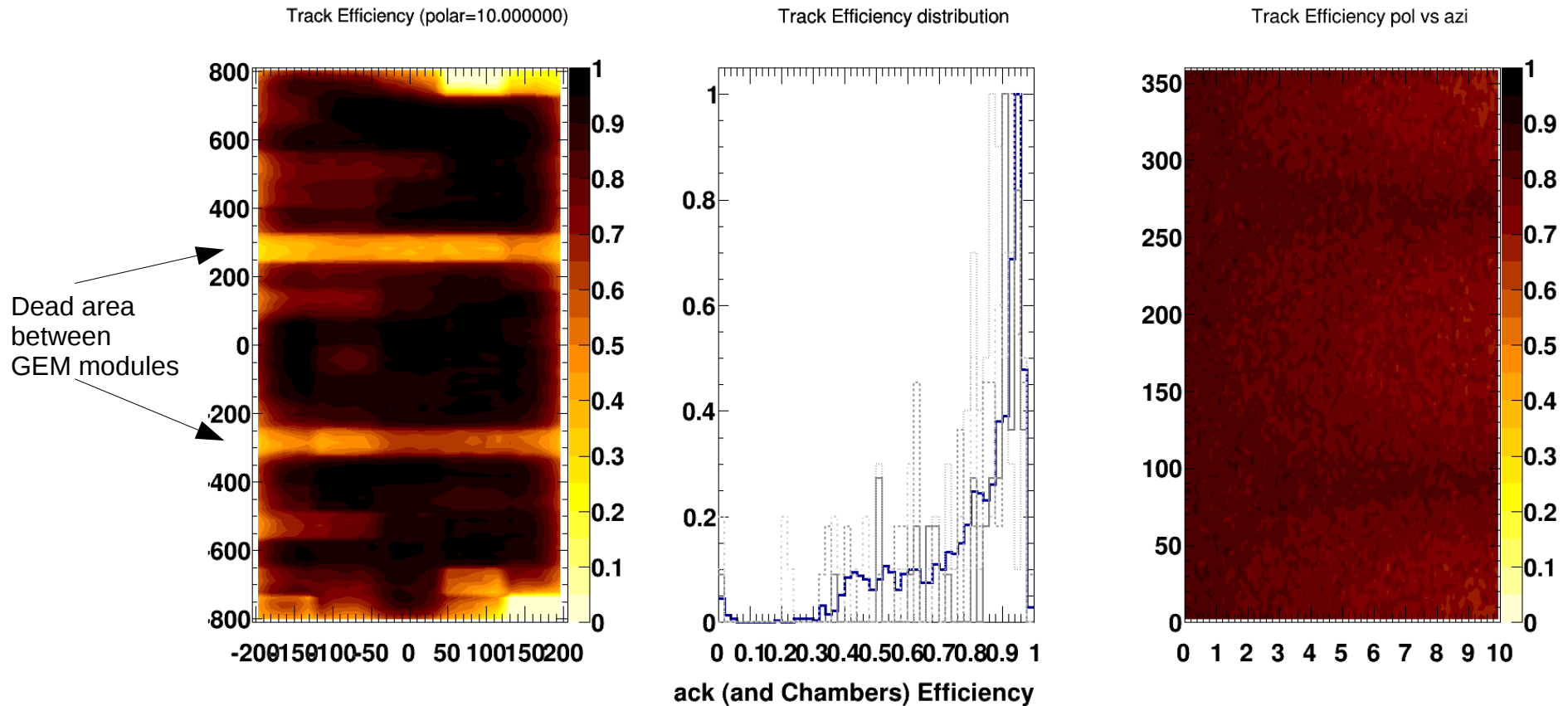
Trigger Acceptance (one scintillator off)



White sectors have shorts; they cannot be fixed: ~5.4% geometrical inefficiency

Hit reconstruction looks pretty reasonable: spacers are clearly visible and well defined.
Optimization of threshold and x/y strips association not done yet

Tracking Efficiency / 4200 V



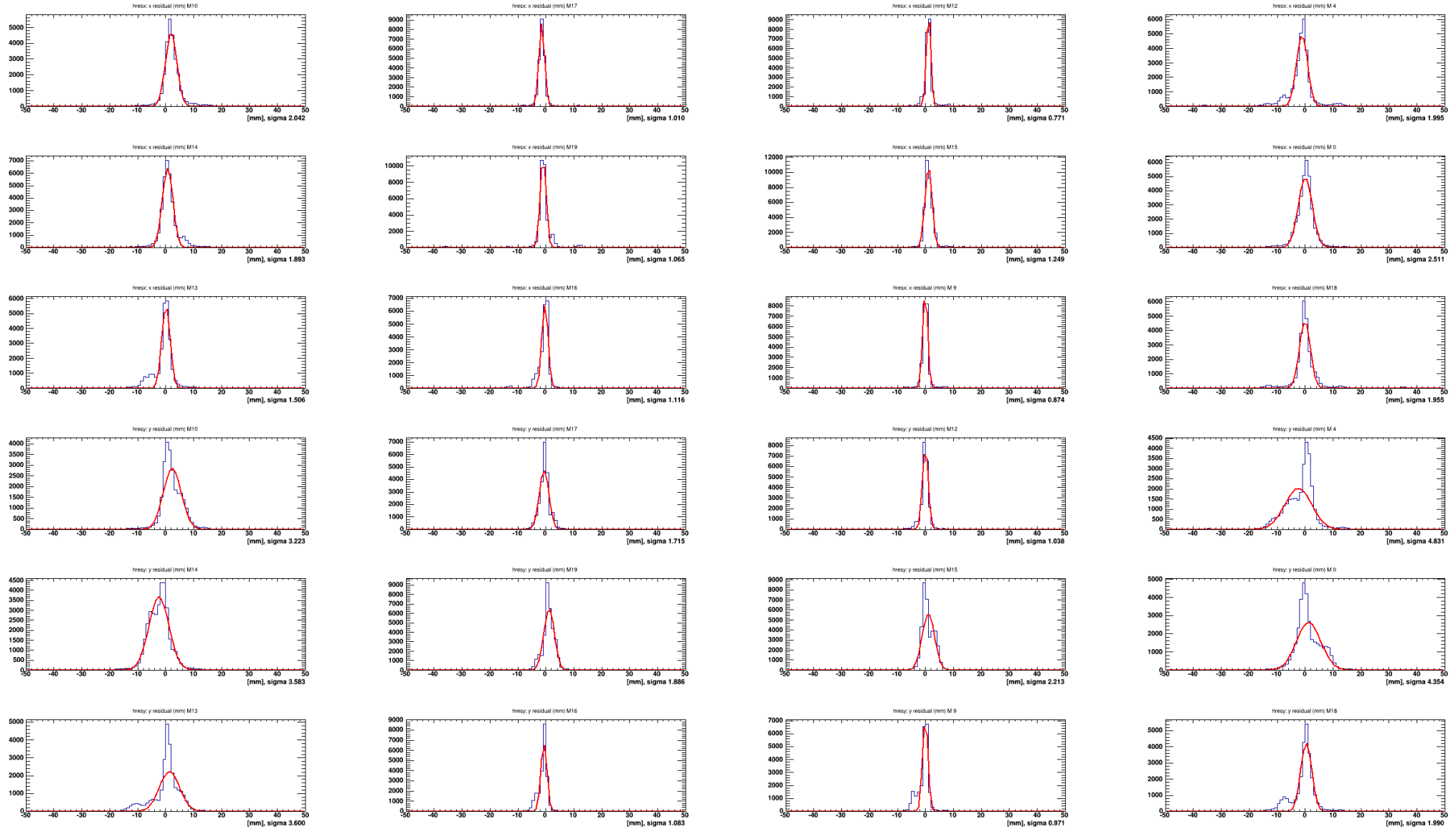
Estimated efficiencies:

- chamber: look at hit within a given distance from expected hit from track defined by the other 3 chambers.
- track: at least 3 hits out of 4 chambers, based on chamber efficiencies (assume single track/event)

*In large occupancy regime, tracking efficiency expected to change significantly:
U/V GEM construction highly encouraged!*

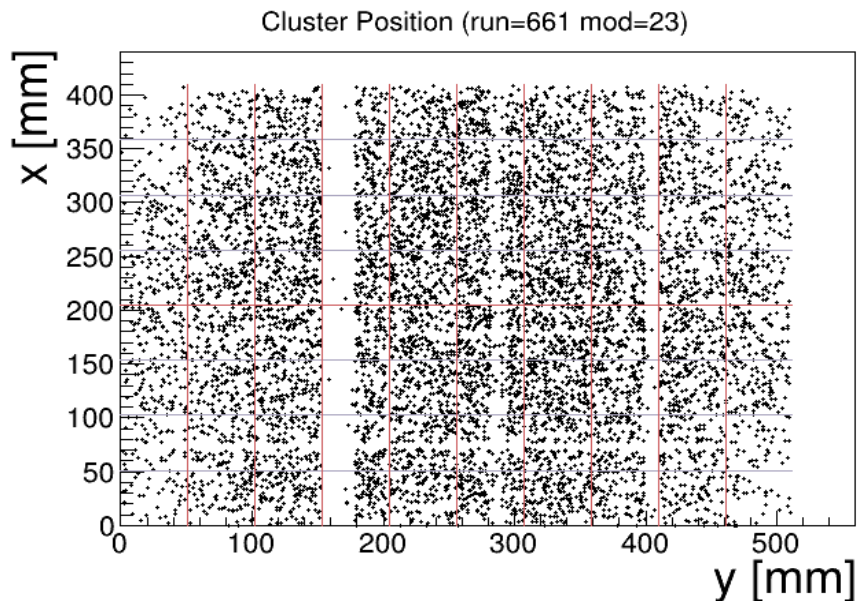
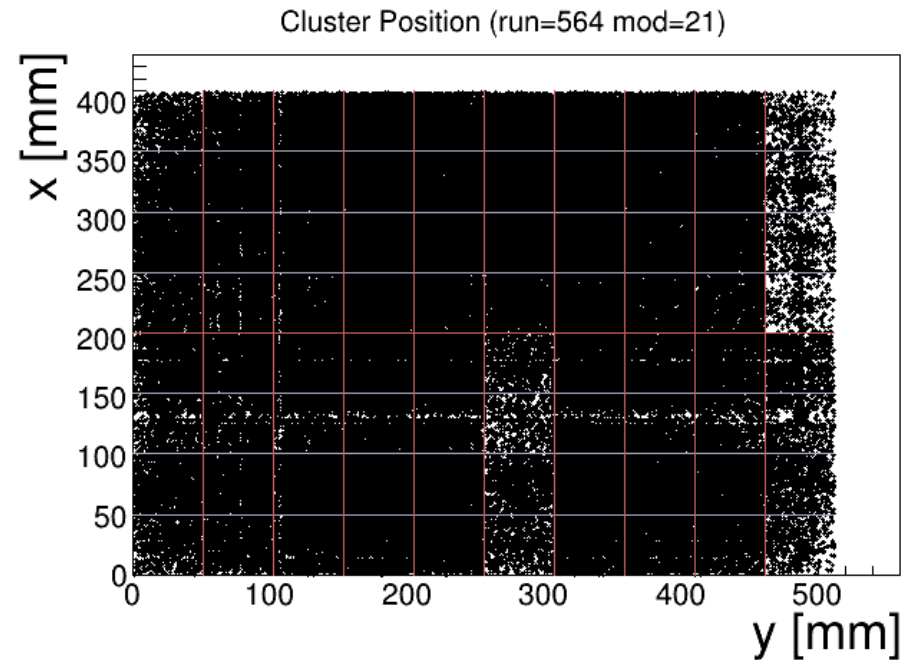
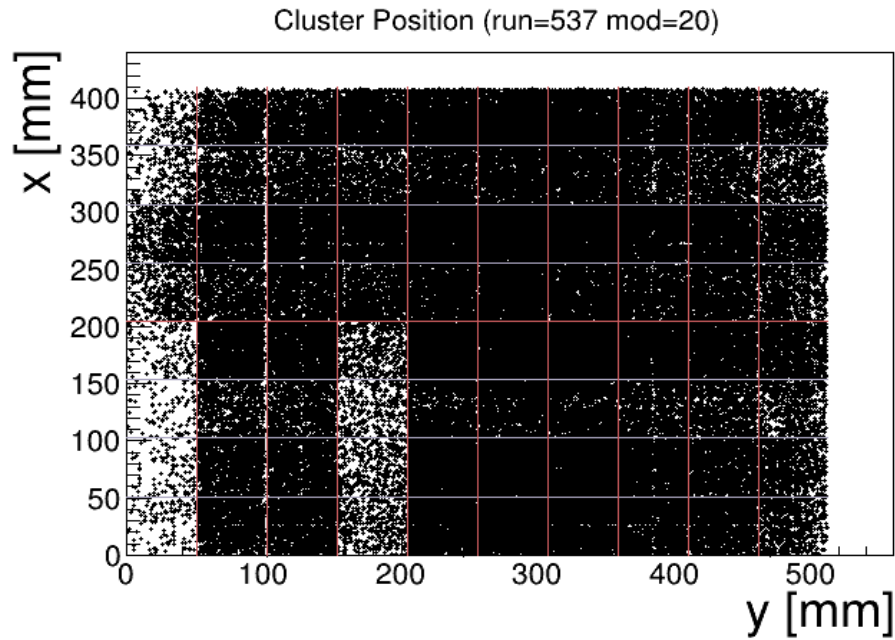
Residuals / run 3805

“G-34” Alignment



gaus sigma fit: 0.7 – 4.8 mm ... need better alignment!

Additional GEM modules / Xray test



Module 20 and 21 are at JLab

Module 23 in Rome

→ Can be used for the 5th chamber

Ongoing module assembling

1 module assembled, ready for test

1 additional module is under assembling (all 3 GEM foils quality checked)

we have material for two additional modules (but 2 foils did not pass the QA checks, need to be cured at CERN, 3 to be QA)

In total we have:

- 4 GEM chambers

- 3 modules tested → we can assemble 1 chamber

- 2 modules assembled by end of June (to be tested!)

- 1 module (at JLab) that can be possibly fixed

- 2 potential additional modules assembled by Fall/Winter 2019

Plan

June-July/19

- complete 2 GEM modules (in Catania) then X-ray test (in Rome)
- ship GEM modules to JLab (hopefully 3)

July-Sep/19

- optimize BigBite GEM configurations (using all existing modules)
- install the 4 GEM chambers into BigBite

> Sep/19 (once the “clean area” has room for new chambers)

- integrate latest module(s) in Catania (after GEM foil cured at CERN)
- Assemble 5th GEM chamber (JLab)
- Try to fix module M1 that shows a large dead area (likely an HV line issue)
- As soon as we have 3 modules assemble the last (6th) GEM chamber