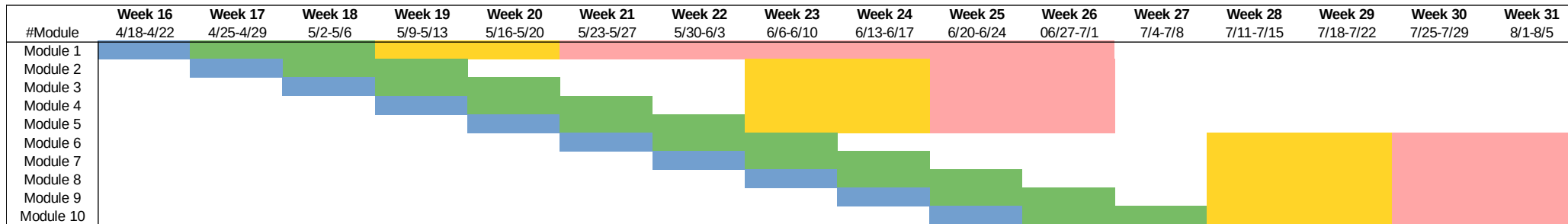# TPOT testing and assembly planing

Hugo Pereira Da Costa (CEA Saclay/LANL),
for the TPOT team

Outline

- TPOT modules production schedule

- Detector characterization at Saclay

- Detector + SAMPA test at BNL

- ~~Test beam at Fermilab~~

- Detector characterization at SBU

- TPOT assembly at BNL

- Post assembly tests at BNL

TPOT modules production schedule

#Module	Week 16 4/18-4/22	Week 17 4/25-4/29	Week 18 5/2-5/6	Week 19 5/9-5/13	Week 20 5/16-5/20	Week 21 5/23-5/27	Week 22 5/30-6/3	Week 23 6/6-6/10	Week 24 6/13-6/17	Week 25 6/20-6/24	Week 26 06/27-7/1	Week 27 7/4-7/8	Week 28 7/11-7/15	Week 29 7/18-7/22	Week 30 7/25-7/29	Week 31 8/1-8/5
Module 1																
Module 2																
Module 3																
Module 4																
Module 5																
Module 6																
Module 7																
Module 8																
Module 9																
Module 10																

Legend	
	Production
	Testing + metrology at Saclay
	Shipping to BNL
	Testing at BNL/SBU

Updated based on discussions with Saclay, final milestones in contract with BNL

Assumes average production rate of 1 module/week since week 16

Assumes two weeks/module for testing at Saclay, two weeks for shipping, 2 days/module for testing at BNL

Detector characterization at Saclay

All those will be available for each detector before shipping to BNL:

- Gain map
- Gain curve vs HV with 55Fe
- Efficiency map
- Efficiency curve vs HV
- Resolution (using cosmics)
- Noise per channel
- Dead/short-circuited channel map
- Gas leak rate
- Leak current on the resistive layer
- Leak current on the drift
- metrology
- basic production information, date, internal serial number

Detector + SAMPA test at BNL

What:
Measure detector efficiency with SAMPA electronics using cosmic trigger, in Bob Azmoun's lab, measure noise levels. Find working point in terms of detector gain, threshold, shaping time. Measure resolution using Xray gun. Prepare Fermilab test

When:
May 23 - June 3 (2w)

Where: Bob Azmoun's lab

Who:
Takao Sakaguchi, Bob Azmoun, John Kuczewski, Hugo Pereira Da Costa
+ remote support from Audrey Francisco, Maxence Vanderbroucke (Saclay)

What is needed:
First "production" TPOT module.
All services (LV, HV, gas) already available in Bob's lab
FEE + backend also available in Bob's lab.
Cosmic trigger
Xray gun
Dedicated mechanics to use TPOT with cosmic trigger and Xray gun

Detector characterization at SBU

What: Make sure detectors have not been damaged during transportation.
Check HV and currents, gas tightness.
Possibly measure gain with nominal gas (Ar/iC4H10 95/5) and 55Fe

When: First batch of detectors: June 20
Second batch: July 25
One person would need to go in advance (1w) to prepare (Hugo)

How long: 2w, for each batch (2 days per module)

Where: SBU (room S118)

Who: Bade Sayki, Hugo Pereira Da Costa, Audrey Francisco, Maxence Vanderbroucke (remote for first batch, in person for second batch)
 + local support

What is needed:
HV: use received mainframe + modules from CAEN. HV cables provided by SBU (or connect directly from detector)
Gas: pre-mix, gas bay, bubblers, available at SBU
Electronics: need basic electronics only (e.g. Ortec) to measure gain, and a way to short circuit all channels
55Fe source: provided by SBU

TPOT assembly at BNL

What:
Assemble cradle. Assemble support structure on cradle. Assemble detector on support structure. Survey detector on support structure.

When:
June 27 to Sept 5 (10w), assuming FDR on May 18, one month delivery of remaining parts and 1w preparation.
Will start in parallel to testing the Micromegas detectors at SBU

Where: Building 912

Who:
Stefan Aune (1w, 10d max), Arnaud Bonenfant, Cyril Goblin from Saclay
Walter Sondheim, Eric Renner (LANL)
+ technical support from BNL, to be clarified

What is needed:
All mechanical parts, including cradle, all detectors (in 2 batches), all cables, at least from detector to patch panel
Documented procedures
Dedicated space at BNL (bdg 912)

Post assembly tests at BNL

What:
Test that everything is connected properly and alive once TPOT is assembled and before it is installed in TPC:
- gas tightness
- FEE cooling tightness
- all LV connected to FEE boards
- all HV connected to detectors
- leakage currents
- all electronic channels responding
- noise levels
- detector survey on structure

When:
Sept 5 to Oct 3 (4w)

Where: Building 912 or (more likely) 1008

Who:
Hugo Pereira Da Costa, Bade Sayki, Takao Sakaguchi + support from BNL (John H., John K.) + support from Saclay

What is needed:
Assembled TPOT
All services: LV, HV, gas, cooling, fibers, FEE + backend, Detector-to-FEE transition etc.
Will depend a lot of global sPHENIX schedule and services availability at 1008