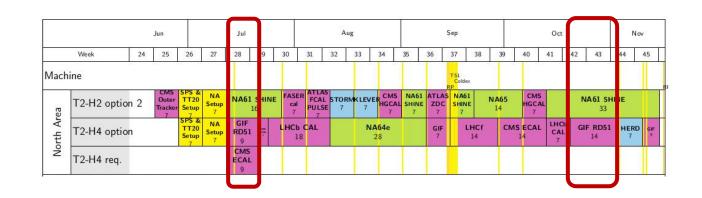
# RD51 H4(PPE134) 2021 Test Beam

- Physics scope
- Beam requirements
- Infrastructure needs



Mon. 12/07/2021 - Wed. 21/07/2021

Wed. 20/10/2021 - Wed. 3/11/2021

- Yorgos Tsipolitis, Eraldo Oliveri
- 20<sup>th</sup> May 2021





# Physics Scope (2021)

### Generic and Application driven R&D

Muon/Tracking: GEM, mm and μRWELL TPC: TimePix (LC), Twin and Tandem GEM TPC (Beam monitoring) Timing: PICOSEC micromegas, FTM Calorimetry: RPWELL (DHCAL) Medical: mm (Proton Computed Tomography)

#### **Project driven R&D**

HL-LHC: GEM (CMS), mm (ATLAS) and μRWELL (LHCb) FCC-ee: μRWELL (IDEA) PBC: mm and GEM (AMBER/COMPASS++)

#### **Detector Commissioning**

e+e- collider : CGEM(BESIII)

## FE electronics and DAQ

TIGER-GEMROC VMM3a-SRS

Week 28-29	Project/Experiment	Beam Requirements	Reference Team
AMBER upgrade (mm & TIGER)	AMBER upgrade (mm & TIGER)	mu	INFN Torino
RPWELL	DHCAL	mu, pi	WEIZMANN
	Upgrade of current inner drift chamber with a cylindrical GEM	mu, pi	INFN Ferrara
PICOSEC	Fast and Precise timing with MPGD (micromegas)	mu, e-	PICOSEC Coll.
SRS/VMM3a Gem TPC	Beam Monitoring TPC	mu, pi, high rate	HIP-GDD
TPC-TimePix (?)	Detector commissioning	mu, pi	Nikhef
Tandem Gem TPC (?)	Beam Monitoring TPC	mu, pi	Wigner
RD51	New FE&DAQ for beam telescopes (SRS/VMM3a)	mu, pi, high rate	RD51 VMM

Week 43-45	Project/Experiment	Beam Requirements	Reference Team
COMPASS Upgrade	AMBER upgrade (mm & TIGER)	mu	INFN Torino
RPWELL	DHCAL	mu, pi	WEIZMANN
COMPASS++/AMBER	COMPASS++/AMBER upgrade (GEM)	mu	BONN-GDD
CMS	GE2/1, ME0	mu, pi	CMS GEM
IDEA project	uRWELL	mu	LNF uRWELL
FTM, High Resolution GEM	FTM, GEMs	mu, pi	INFN Bari
Small Pad Resistive mm & embedded readout	Small Pad Res. Mm	mu, pi	INFN Roma 3, Naples, CERN
SRS/VMM3a Gem TPC	GEM TPC	mu, pi	HIP
PICOSEC	Fast and Precise timing with MPGD (micromegas)	mu, e-	PICOSEC Coll.
Proton Computed Tomography	Detector commissioning / Med	mu	LMU
Tandem Gem TPC	Beam Monitoring TPC	mu, pi	Wigner
RD51	New FE&DAQ for beam telescopes (SRS/VMM3a)	high rate pi	RD51 VMM
RD51	RD51 muRWELL telescope	mu, pi, high rate	RD51 muRWELL tracker

## More info @ https://indico.cern.ch/event/989298/timetable/#20210219.detailed



## **Beam Requirements**

Week 28-29:

- mu,pi: highest rate as possible (limited previously by radiation alarm(\*)). Polarity and momentum not important (the configuration offering the highest rate is the preferred one). We would like to change from muons to pions several times during the beam period as we did in the past (informing GIF++ in advance).
- 2. e[?]: 100GeV/c for 4-8h (middle or end of the beam can be just before MD if better). STILL UNDER DISCUSSION

Week 42-44:

- mu,pi: highest rate as possible (limited previously by radiation alarm). Polarity and momentum not important (the configuration offering the highest rate is the preferred one). We would like to change from muons to pions several times during the beam period as we did in the past (informing GIF++ in advance.
- e: scan 20-250GeV/c for about =<24h (middle or end of the beam can be just before MD if better). Cherenkov detector upstream (zone PPE124) for triggering or for measuring precisely the purity of beam configuration. [UNDER DISCUSSION]</li>

(\*) with mu and pi we usually went up to few 10<sup>4</sup> and 10<sup>6</sup> per spill (4-5 sec) respectively. It would be useful to investigate if we can safely increase the rate (1 order of magnitude more would be really appreciated – studies @ higher rates and statistics).



## **Infrastructure Needs**

Infrastructure Needs (NA)	Week 28-29	Week 42-44	
	Upstream/inside/Downstream Goliath	Upstream/inside/Downstream Goliath	
PPE 134 Installations	(beam pipe to be removed everywhere)	(beam pipe to be removed everywhere)	
GAS zone (887/R-C47)	Installation of several non flammable cylinders	Installation of several non flammable cylinders	
	2 lines form 909: (Ne/CF4/C2H6 80/10/10), 1	3 lines form 909: (Ne/CF4/C2H6 80/10/10),	
Flammable Gas Operation (*)	line (Ar/iC4H10 90/10)	(Ar/iC4H10 90/10), (mixture with iC4H10 - tbc)	
Desy Table	2	2	
XSCA Table (**)	1(?)	2	
Survey (detector alignment)	Yes	Yes	
GOLIATH	NO	?	

(\*) Important to have support night/week-end and reading of pressure on a daily basis – 909 not accessible to users (\*\*) LAPP table that we used in the past would fit as well with our needs.

### INSTALLATION Week 28-29 (9days of beam) :

- It would be important to move (crane) our staff in the week before (we can then work on the week-end).
- It would be important to have access to area and CR in the weeks before to start some installation (no problem if beam line will be occupied by the beam pipe).
- It would be very good if beam pipe would be removed on Friday 9<sup>th</sup> of July.

### CONTROL ROOM & COVID:

• Several groups (shifters) running in parallel (potentially up to 6 team in July and up to 12 in October)

