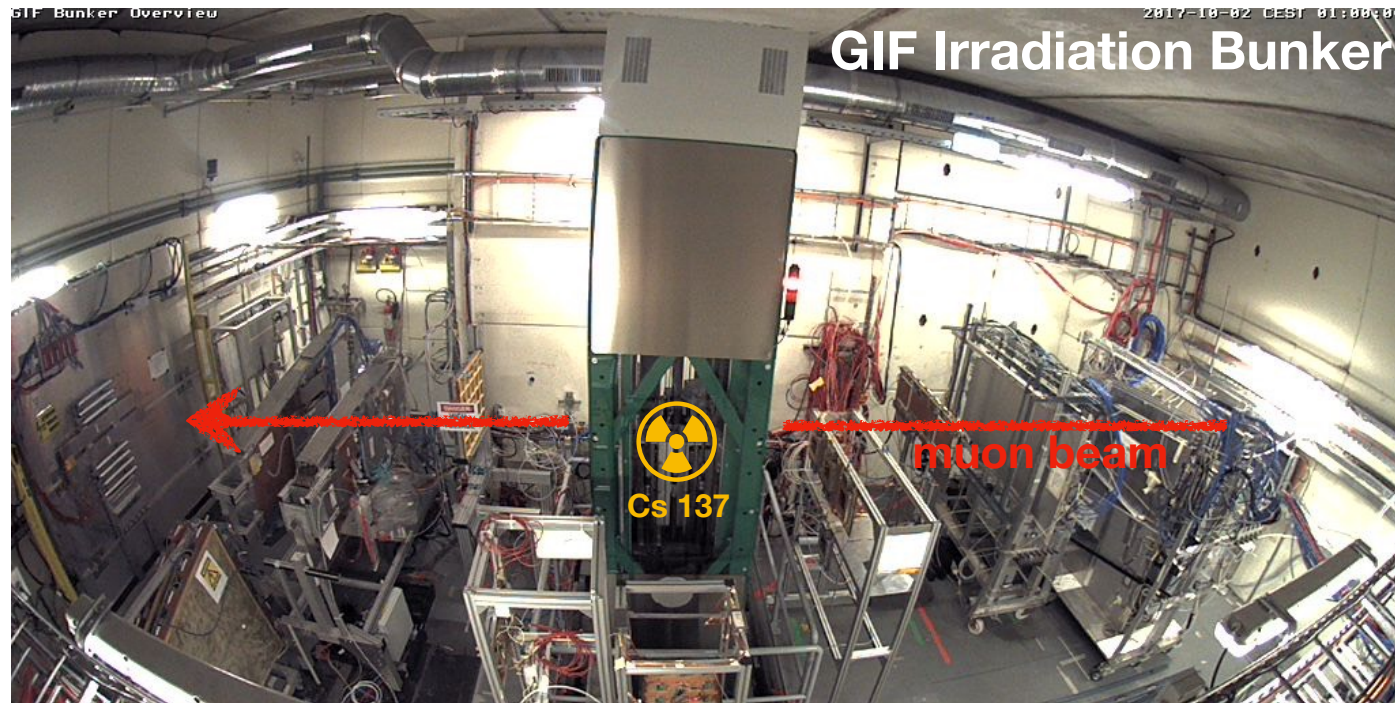
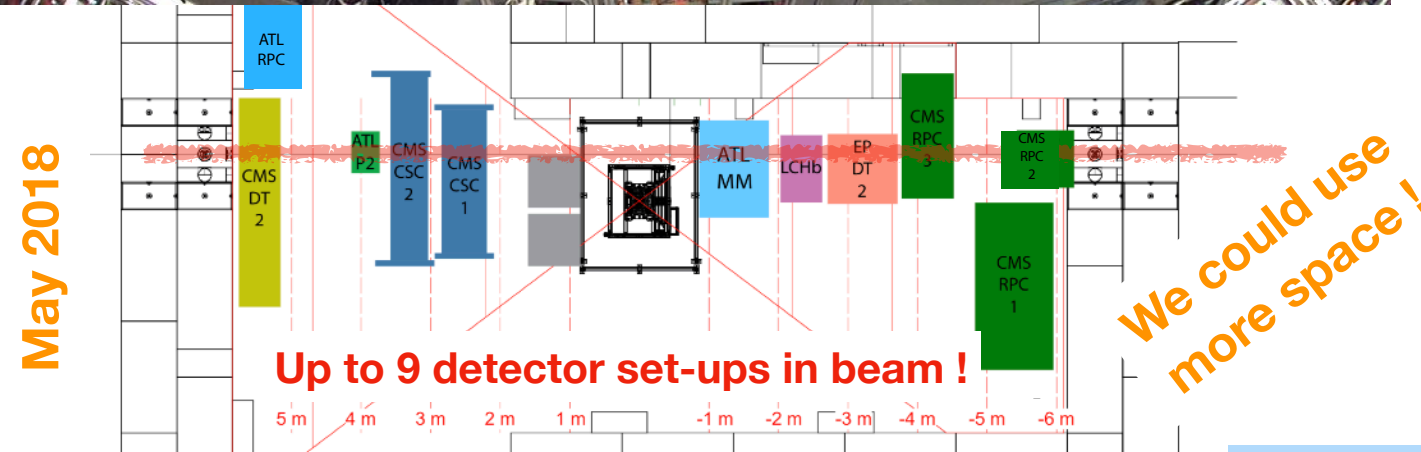


Gamma Irradiation Facility @ EHN1



- Joint facility, operated by EN-EA and EP-DT
- Unique place, combining a **high energy muon** beam with a **14 TBq ¹³⁷Cs gamma source**
- Designed for testing **real size detectors**, of up to several m², as well as a broad range of **smaller prototype** detectors and electronic / optical components.
- 100 m² irradiation bunker with 2 independent irradiation zones, separated attenuation systems
- All year operation** from Cs-Irradiator
- Central Control System, wide range of available gases (+ custom gases) in bunker & service zone



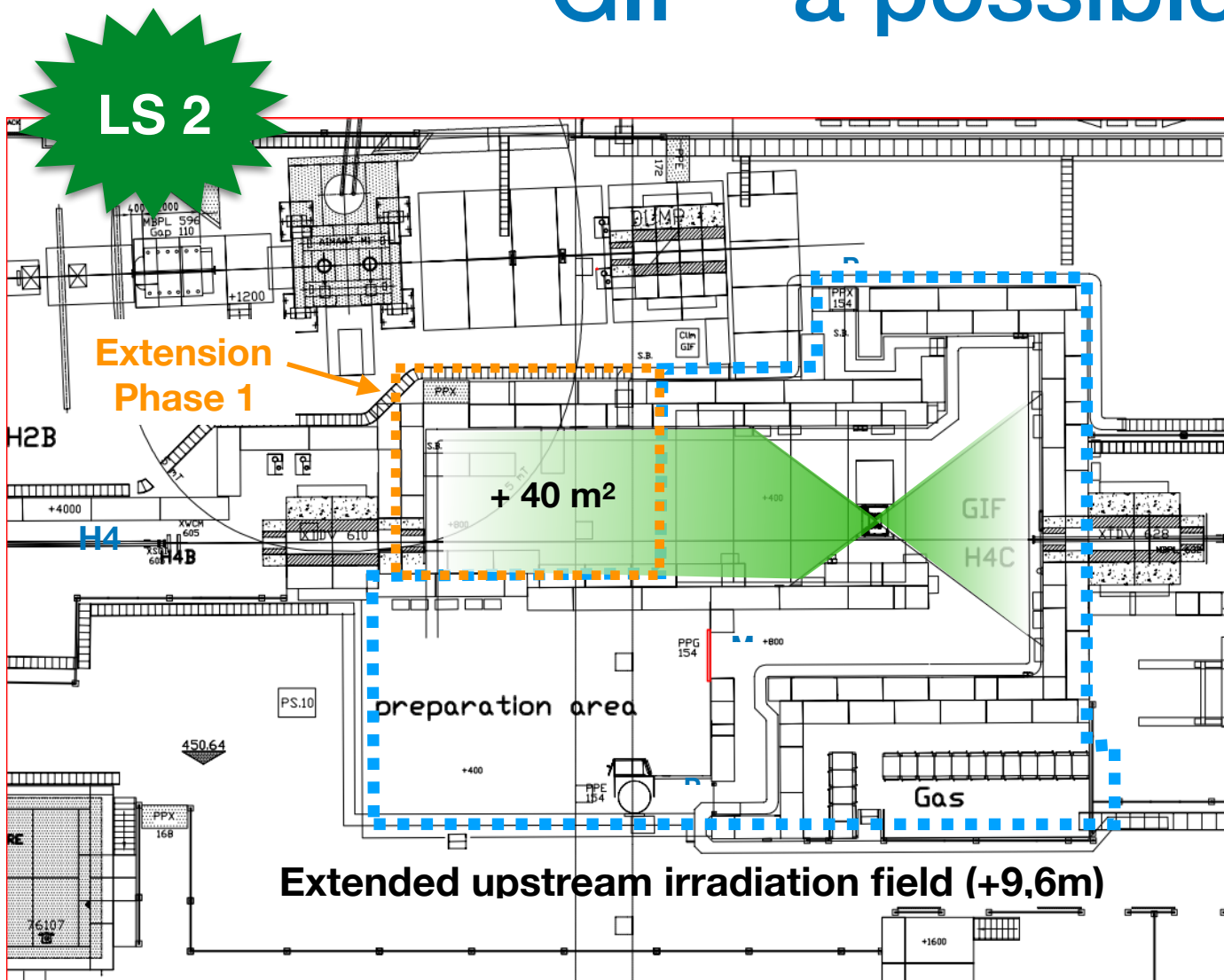
Description of each set-up available at <https://gif-irrad.web.cern.ch/gif-irrad/UserList.html>

- 2018 again a very intense beam time
 - 6+1 Muon beam weeks (9 weeks requested)
 - ≈ **20 Setups requesting beam time**
 - 10-12 setups requesting to run in parallel
 - Last muon beam before ≈ May 2021
- In addition : Multiple setups for irradiation only
- Start of **mass-production test** campaigns (HL-LHC)
 - Hundreds of real size muon chambers
 - Stress on material access and scheduling

- Beam Requests 2018**
- ATLAS : MDT, MM, sTGC, RPC
 - CMS : CSC, DT, RPC
 - LHCb : Muon
 -
 - EP-DT RE21(CBM)

- Current challenges :**
- ▶ High γ -irradiation campaigns (max.collective dose) vs. low radiation ageing tests
 - ▶ Space along the muon beam path
 - ▶ Access & space restrictions due to downstream experiments (incl. beam pipe)

GIF - a possible way forward



Possible extension of the Irradiation bunker during LS2, currently under consideration

- Investigation ongoing if **irradiation zone can be extended upstream** (+40 m²) ,
 - Compatible with new PPE-144 zone proposal
 - More space for placing set-ups in muon beam, already during Run 3
 - Lower radiation zone, due to increased distance (up to ≈ 15 m from source). Reduced need of attenuation.
 - More space for mass production tests !

ECR approved, budget REJECTED

- **Part of broader long term plan** to cope with future requirements for a gas detector test facility (sideways extension, source upgrade etc.)
 - Will depend on the future needs for R&D, currently under discussion

Ongoing improvements during 2018 :

- Further ~~improvements of environmental conditions (stable temperature / humidity) planned~~
- Ongoing developments in control system and radiation/dose monitoring
- Extension of cosmic trigger scheduled, with up to 4 trigger chambers placed around the bunker
- Additional shielded rack space inside irradiation bunker for electronics requiring short cable paths

Current situation :

9 weeks requested, 6 (+1) week allocated

Nr #	IMPACT	position (meters from the source)	setup size (beam dir x width x height)	#weeks (total)	Apr 25-01	May 02-08	Aug 01-07	Aug 08-14	Aug 15-21	Aug 22-29	Oct 24-30
1	MISSING ATL-MDT	50 cm	0.6 x 1.2 x ? m	6	-	-	X	X	X		X
3	106299 ATL-MM & MM-LM2M0	?	1m x 1.4m x 1.8m	6	X						X
18	112713 EP-DT 2	U 350cm	0.8 x 1 x 2 m	1	X	X	X	O	X	X	
14	112859 CMS-RPC1	4153 mm	1.1 x 2.36 x 2.2 m	6	-	X	X	X			X
15	112858 CMS-RPC2	1800mm	0.8 x 0.8 x 2.2 m	6	X	X			X	X	X
16	112857 CMS-RPC3	2800mm	0.8 x 1.8 x 2.2 m	6	X	X	X	X	X	X	X
20	112288 LHCb-M2R2	1-1.5 m	0.6m x 1m x 1.8m	6	X	X		O	X		O
2	112197 ATL-Phase-II system test	~1-2 m	0.4 m x 0.6 m x 1.8 m	6	X	X	X	X	X		X
5	MISSING ATL-sTGC	1-2 m	0.5-1 x 1.5 x 1.5 m	4				X	X		X
6	114660 ATL-RPC	4-4.5	0.80 x 0.8 x 1.80 m	6		X	X	O	O		X
7	107041 CMS-CSC1	D 2.40	0.85 x 2.22x1.8 m	6	X	X	X	X	X	X	X
8	107044 CMS-CSC2	D 3.30	0.85 x 2.8 x 1.8 m	6	X	X	X	X	X	X	X
11	104077 CMS-DT-MB1	D 500	0.5 x 2.5 x 3 m								
12	104078 CMS-DT-MB2	D 500	0.5 x 2.5 x 3 m	4	X						X ?
17	106277 EP-DT 1	D 200 cm	0.5 x 0.8 x 1.8 m	4			X	X	X	X	
19	102679 CBM-TRD MWPC	?	?	1							X
Total :					9	9	9	9	10	6	12
Actual					9	9					

Recently allocated week filling up fast

So what's next ?

- Extension costs reviewed, compromises on humidity, ventilation, gas zone... now **below 160 kCHF !**
- LHC experiments are the main user. We will need their help.
- If budget can be found, we will ask again for approval of GIF extension.