GIF 2025 beam time preparation

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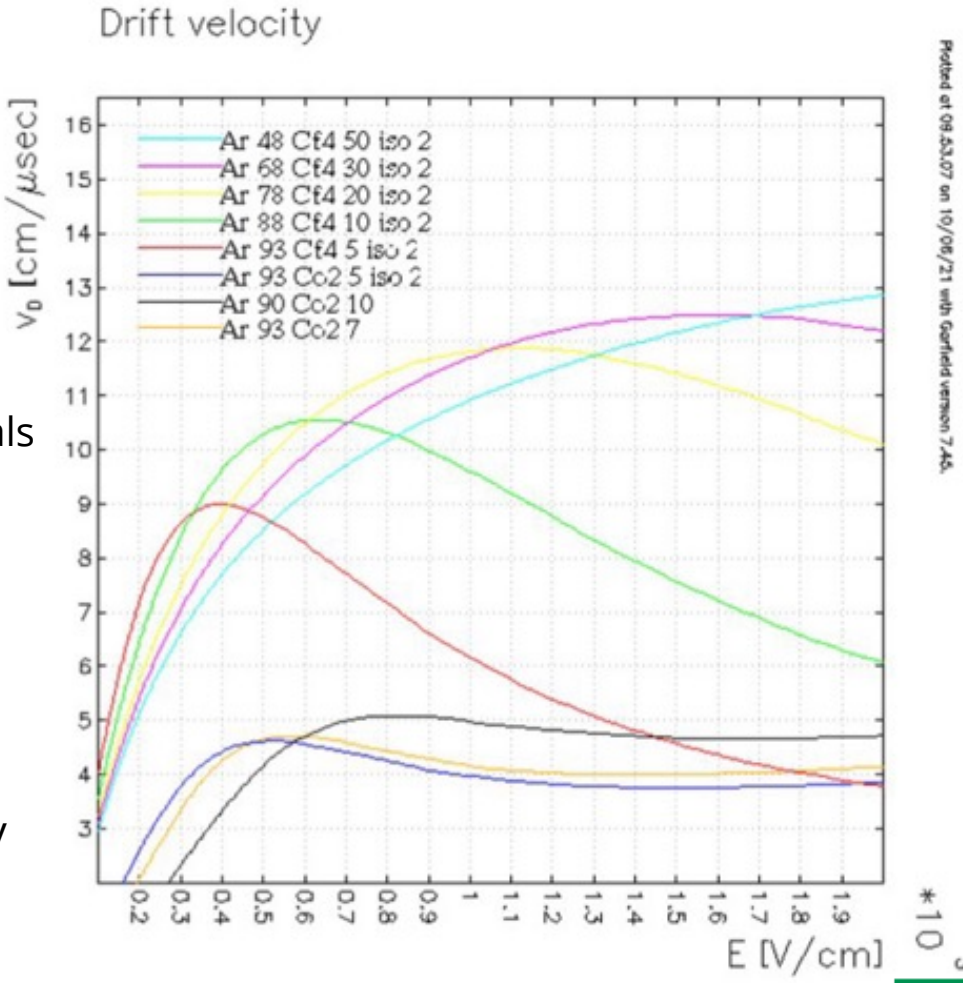
GIF++ 2025 test beam

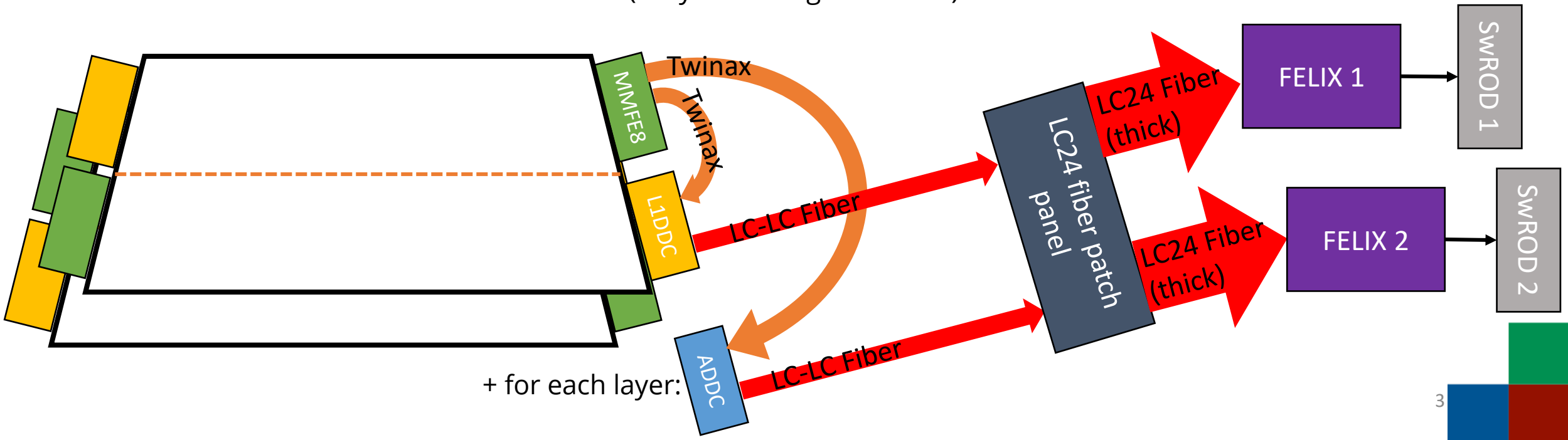
- Test of Ar:CF_4:iC_4H_{10} 88:10:2 gas mixture in ATLAS Micromegas detector
- Targets:
  - Evaluate time resolution with faster drift velocity
  - Check the robustness of good performance of spatial resolution with faster drift velocity
  - (Possibly) Check the Micromegas trigger path reading out the ART signals
- GIF++ location chosen due to services already available
- Multiple possibilities of beam time slots in GIF++:
  → usually 3 x 2 weeks in a year
- Need to prepare and test the setup in BB5 to have it up and working before the installation in GIF++ for the beam time
  → targeting already the 1st beam time that will be probably in April/May
- Movement of SM1 M40 chamber to BB5 foreseen for first days of December, after the gas supply stop in GIF++ to do not impact sTGC operations
- Now checking all the equipment available and all the needs for the setup tests



Difference with standard GIF setup

Ligtweight setup to add the trigger:

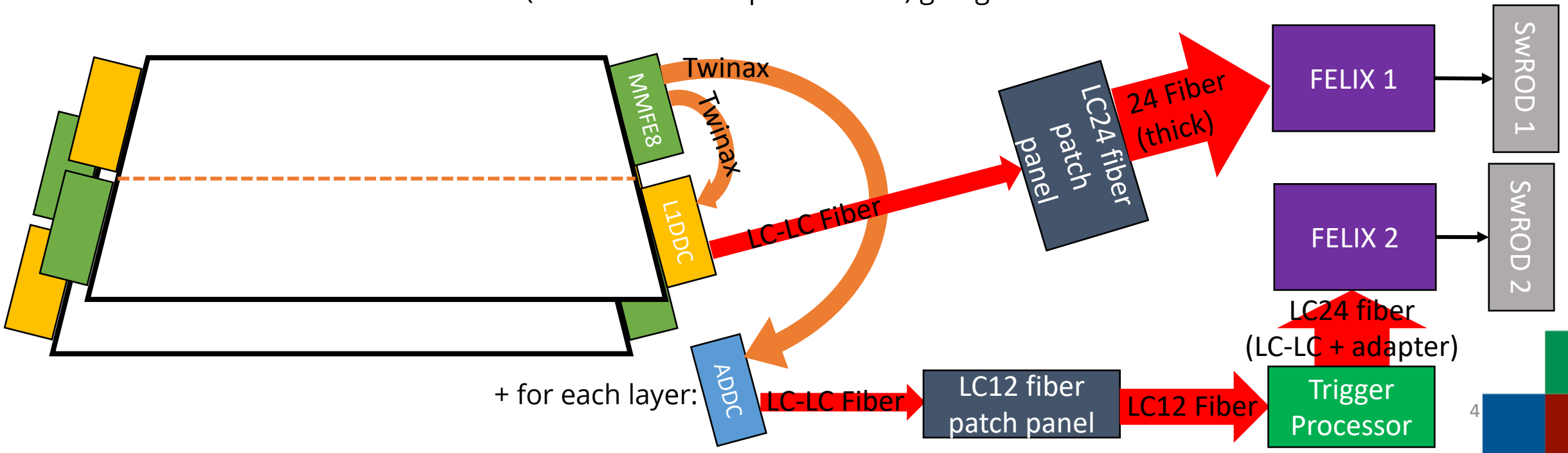
- Additional twinax cable out from the MMFE8 board → only 1 for each layer is sufficient, no need to instrument a full PCB
- 1 ADDC card for each layer
- LC-LC fiber out from each ADDC card (8) going to the standard fiber patch panel we use
  → need of a second LC24 fiber cable to go to FELIX
- Needed some fix in GBTX and FELIX firmware (easy according to Ioannis)



Difference with standard GIF setup

FULL setup to add the trigger:

- Additional twinax cable out from the MMFE8 board → only 1 for each layer is sufficient, no need to instrument a full PCB
- 1 ADDC card for each layer
- LC-LC fiber out from each ADDC card (8) going to a dedicated TP LC12 fiber patch panel
  → output is a LC12 fiber cable going to TP
- 1 ATCA crate with TP board + a fiber (LC-LC fiber + adapter to LC24) going to FELIX



Standard and additional equipment needed

Standard equipment from previous test-beams is available at GIF/BB5:

- HV, cooling, and gas systems (GIF++ setup)
- 1 FELIX (BB5)
- 1 SwROD (BB5)
- 1 network switch (BB5)
- 16 Twinax cables from MMFE8s to L1DDCs
- PDU for remote control of LV power (BB5)
- 1 LV PS Delta SM 15-100 + power cable (BB5)
- LV patch panel (BB5)
- LV cables for powering 16 MMFE8 and 8 L1DDC
- LC24 fiber patch panel with 2 outputs (BB5)
- Short LC-LC fibers to connect 8 L1DDC to the LC24 fiber patch panel (will be substituted by the new long ones, with patch panel outside the bunker)
- VME crate with ALTI and SBC controller (currently used by Kostas in 188, need to get it back or find another one)

Equipment	Quantity	Available?	Comments
Gas bottles	2-3 x 50l bottles	Request via GIF..	To be requested via GIF, not yet sure it is available..
LV power supply	1	1 taken from Epool	Delta SM 15-100 available from last test-beam, Delta SM 32-45 needed for backup/trigger taken from Epool
LV cables	8	BB5?	Banana to LV board connectors (black bundle of cables) – LV patch panel can be shared
ADDC cards	8	188	Available spares at vertical slice, need to connect only 1 L1DDC of each detector layer
Twinax cables	8+8	BB5? 188?	8 twinax MMFE8->ADDC + 8 twinax ADDC->L1DDC. 2 long ones (4-5m) for upstream BL chambers
LC-LC fibers	8(daq) +8(trig)	New order by Ioannis	Ordered 20 x 30m. Theo's idea to use many long fibers and move the patch panel outside the bunker. No more thick long fiber
LC12 fiber	1	188?	From LC12 patch panel to TP for full trigger setup
LC24 fibers	2 (short)	BB5? 188?	To connect the LC24 fiber patch panel to Felix Only 1 for full trigger setup, 2 for lightweight setup
LC12 patch panel	1	188	Only for full trigger setup, not needed for lightweight setup
Trigger Processor	1	188	1 Carrier + 1 Mezzanine set, should be easily retrievable
Mini ATCA crate	1	188?	Should be available but has to be found
FELIX	1	188/BB5	Spares available, additional one to do not overload the DAQ one
SwROD	1	188	Spares available, additional one to do not overload the DAQ one

Back-up