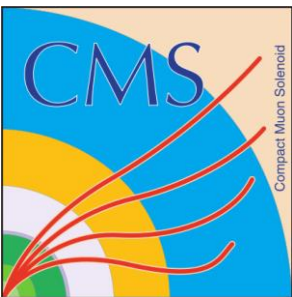


# Readiness of Aachen Production Site

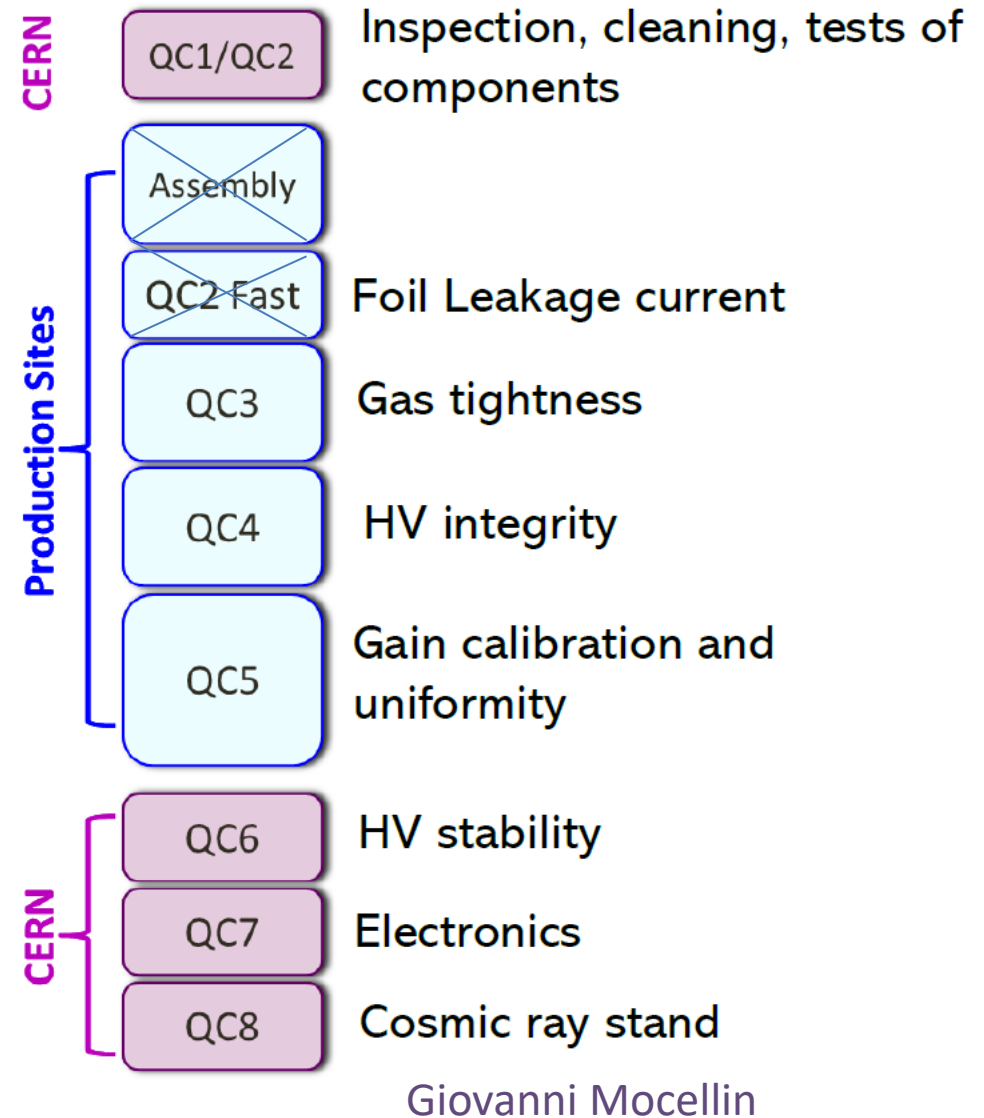
Henning Keller, Kerstin Hoepfner, Giovanni Mocellin,  
Shawn Zaleski

24<sup>th</sup> GEM workshop, Production session October 1<sup>st</sup> 2019



# Aachen Lab Status

- No chamber assembly, since we don't have a clean room.
- Perform QC3 – QC5.
- Teststand certified by CERN team. Material complete and fully functional w.r.t. GE1/1 QC jamboree.
- Lifetime of X-ray source sufficient. Still, backup is available.



# Inventory

Item	Status
Gas, CO <sub>2</sub>	✓
Pressure/Temperature sensor	✓
Electronic DAQ	✓
Dedicated DAQ computer	✓

Item	Info	Status
Gas	Pure CO <sub>2</sub>	✓
HV power supply	Iseq NHQ 205M	✓
Preamplifier	ORTEC 142 PC	✓
Shaping Amplifier		✓
Discriminator	LeCroy Model 623	✓
Linear FIFO		✓
Scaler		✓
Oscilloscope		✓
Panasonic-to-LEMO adapters	N = 60	✓
Terminators 50 Ohm	N = 30	✓
Ethanol supply/Paint brush	Available in electronic workshop	✓
Grounding supplies		✓
Grounding plate	Custom-made	✓

Item	Info	Status
Gas	Ar/CO <sub>2</sub> (70/30)	✓
Grounding plate	Same as in QC4	✓
Grounding supplies		✓
SRS FEC	N=2	✓
SRS ADC	N=2	✓
APVs	Slave=16, N_Slave=16	✓
Euro/minicrate	Power supply	✓
Gbit ethernet switch/cables	N=6 cables	✓
Trigger Generator		✓
Pico-ammeter	Keithley	✓
HV filters	Custom-made	✓
Panasonic-to-LEMO adapters	With 50 kOhm resistor	✓
DAQ computer		✓
X-ray station	Copper box (1mx1.5mx2m)	✓
Amptek X-ray generator	Silver target	✓
Preamplifier	ORTEC 142 PC	✓
Shaping Amplifier	ORTEC 474	✓
Discriminator	LeCroy Model 623	✓
Linear FIFO	PS Model 744	✓
Scaler	Custom-made	✓

Item	Info	Status
Sniffer	O 196 Leak Detector	✓
Giga-Ohm insulator	Megger 485 (replaced by ...IT 420/2)	✓
Multimeter	UT70A	✓
Soldering Iron (Tip/tweezer)	Available in electronic workshop when needed	✓

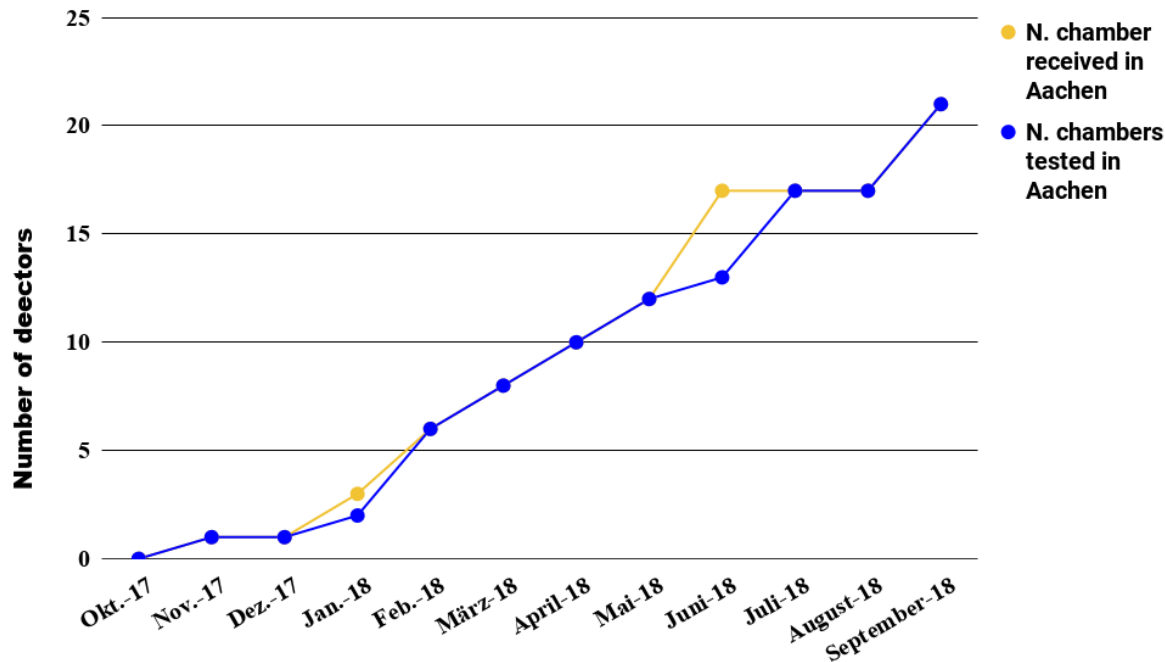
# GE1/1 Experience

- Tested 21 long GE1/1 detectors during production in total.
- Performed tests from QC3 to QC5 gain uniformity.
- Received assembled detectors from Ghent (and CERN).

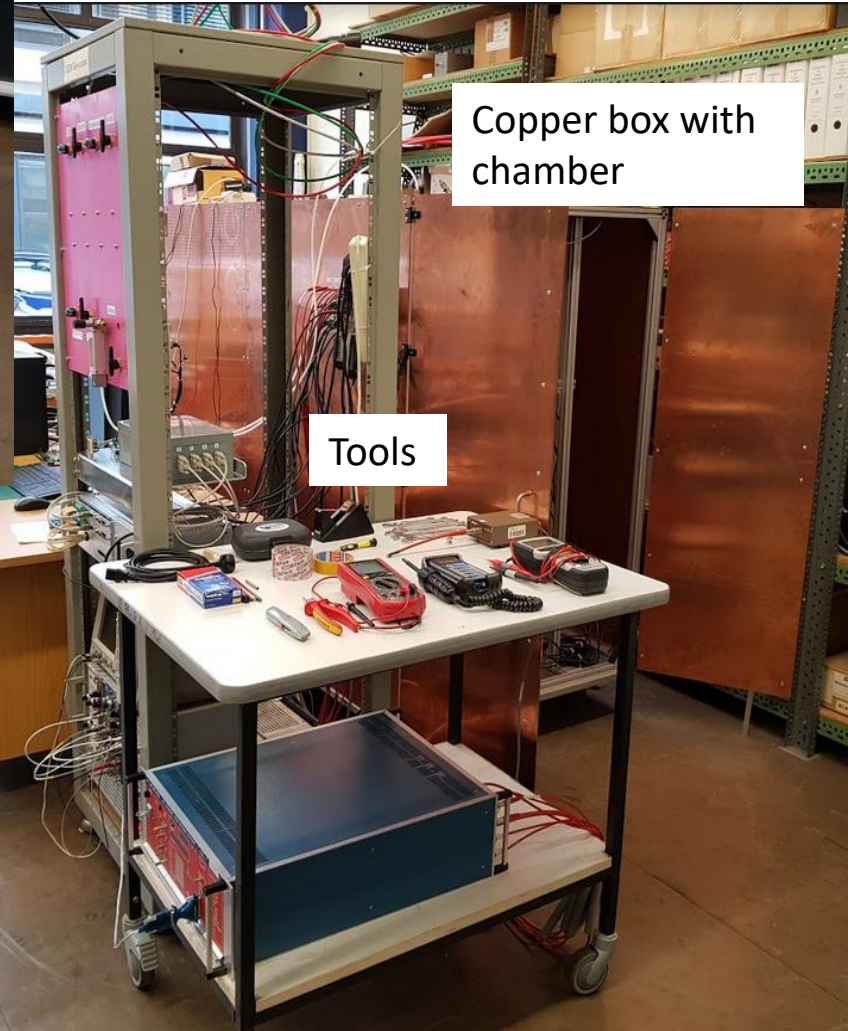
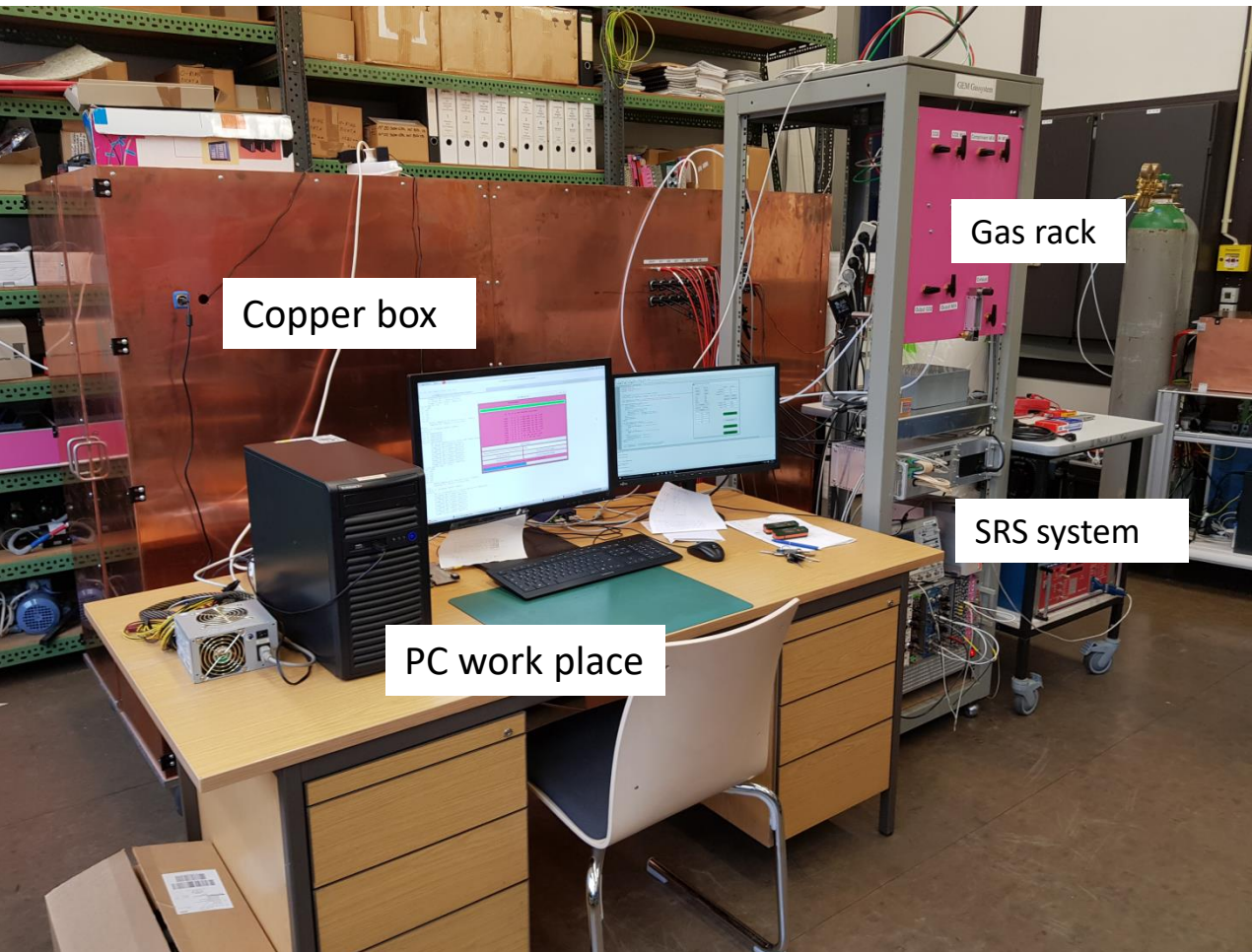
Typical test rate	Maximum test rate
3.5 days/chamber	2 days/chamber

GE1/1 QC mainly done by Henning Keller

GE1/1 Chamber testing in Aachen



# Teststand



And horizontal space to test  
and/or store chambers

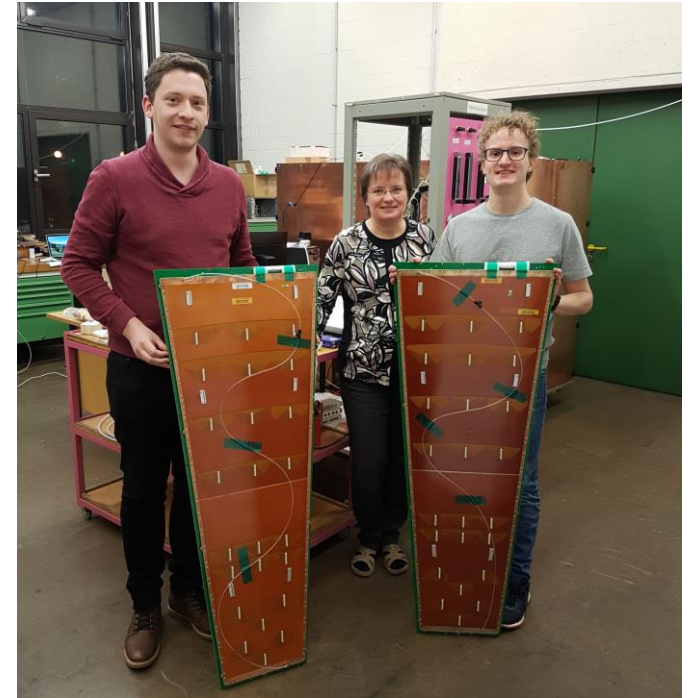
# Available manpower for GE2/1 QC

Following indications from production managers, QC does not start before Spring 2020

## Physicists available for GE2/1 QC at Aachen:

- Kerstin Hoepfner (site manager)
- Henning Keller (PhD)
- Shawn Zaleski (Post-doc)
- One open PhD position to be filled

Mechanics workshop depends on schedule over the year. Holding structure for QC 5 can be done when technical drawing is available.



# To Do

## Hardware:

- Grounding plate for GE2/1. Produced centrally or to be done in Aachen?
- Adapter PCB for readout board to Panasonic connector of APVs (to be bought outside)
- Holding structure for QC5 to be built. Foreseen 2 x 19 M1 modules from Ghent and Sri Lanka. Can we get the link for module drawings?

## Software:

- Update QC5 SW

# Summary

- Successfully contributed to GE1/1 production
- Excellent collaboration with Ghent and CERN for testing/shipment of chambers.
- Manpower for GE2/1 comparable to manpower for GE1/1.
- Also interested to contribute to GE2/1 chamber assembly.



# BACKUP

# Lab updates

- New flow controller (Bronkhorst) for mixing gases
  - Remote control possible (before: manual flow meters)
  - Reduce flushing time during (human) working hours
- Additional option: HV multichannel supply

