VRIJE
UNIVERSITEIT
BRUSSEL

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IIHE update: DAQ & module production

24-11-2017

- people

- DAQ development

- module production preparation

Jorgen

Laurent

Gilles

Pascal

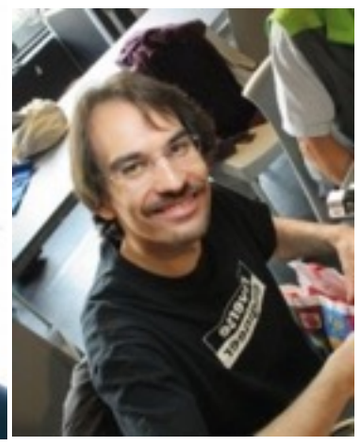
Steven

Bugra

Jelena

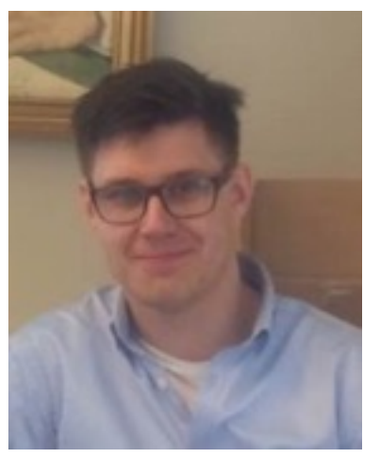
Kirill

Annemie



Yannick

Jarne



Emil

Michael

Wim

Xavier

http://www.iihe.ac.be/whoIsWho.php

DAQ

- Test systems are FC7 based (“d19c”)
- Firmware development for test set-ups is ongoing:
  - supports hybrid testing
  - beam tests
  - only electrical read-out for now
- FW for CBC3 read-out will be used at FNAL test beam
- Now integrating test FW for MPA/SSA chips in the already existing framework -> will allow the chip testing at CERN in January
- Plan to further contribute to the FW developments for test set-ups

Module production

- plan for 2018:
    - build 4 mechanical dummy prototypes within specifications
    - build 3 fully functional modules with prototype parts
- plan for 2019:
    - build more functional modules with closer to final parts
- plan 2020:
    - gear-up for preproduction
- plan 2021:
    - Q1 2021 preproduction = build 5% of 2000 modules
    - 2021, 2022, 2023 -> production

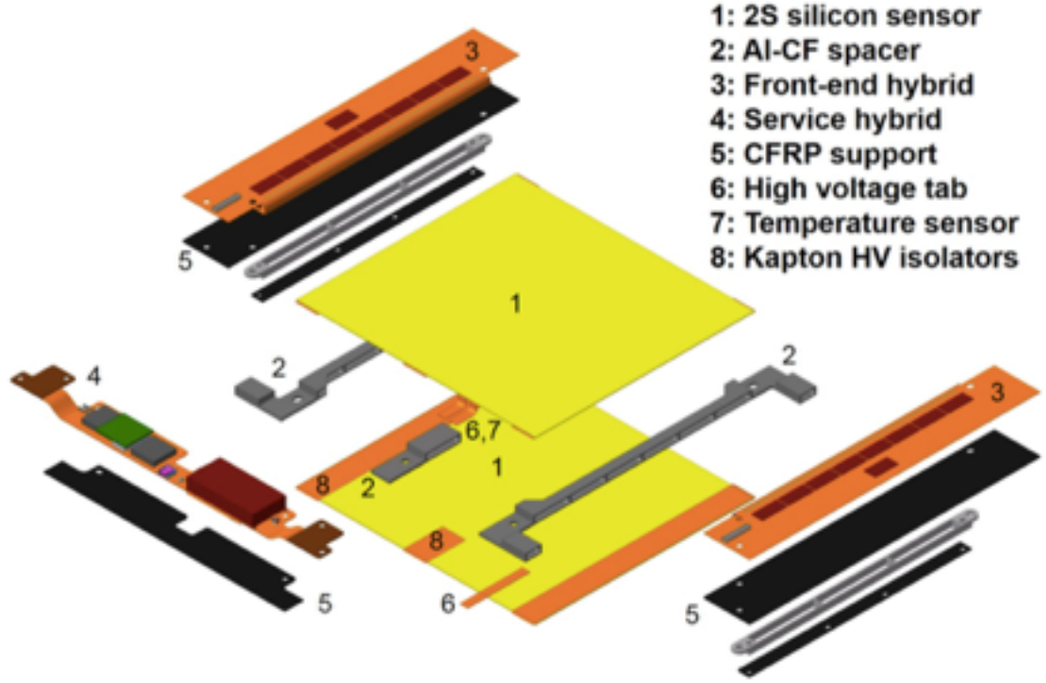
Module production

<u>Ordered pieces for 2018 assemblies:</u>

- 6 functional 320um 2S sensors
- 5 sets of AlCF spacers
- 3 8CBC3 right side functional hybrids
- *3 8CBC3 left side functional hybrids*
- 10 2S kapton HV isolation sets
- 3 2S service hybrid
- 3 HV pigtails

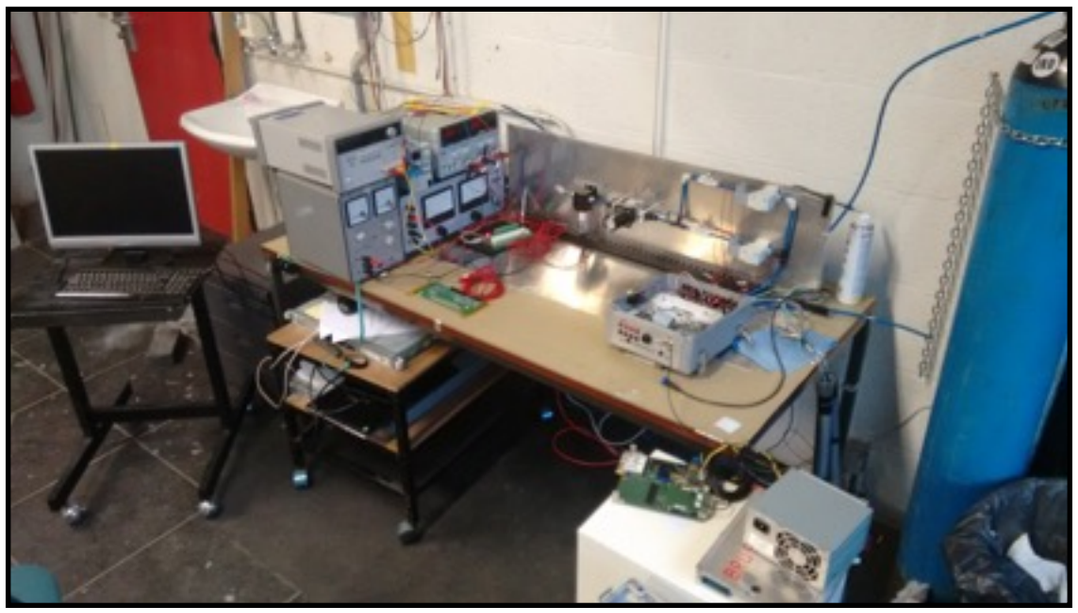
<u>and additional DAQ equipment for testing during production:</u>

- 4 test cards for FC7s
- 5 FC7s (+ 3 in the lab already)



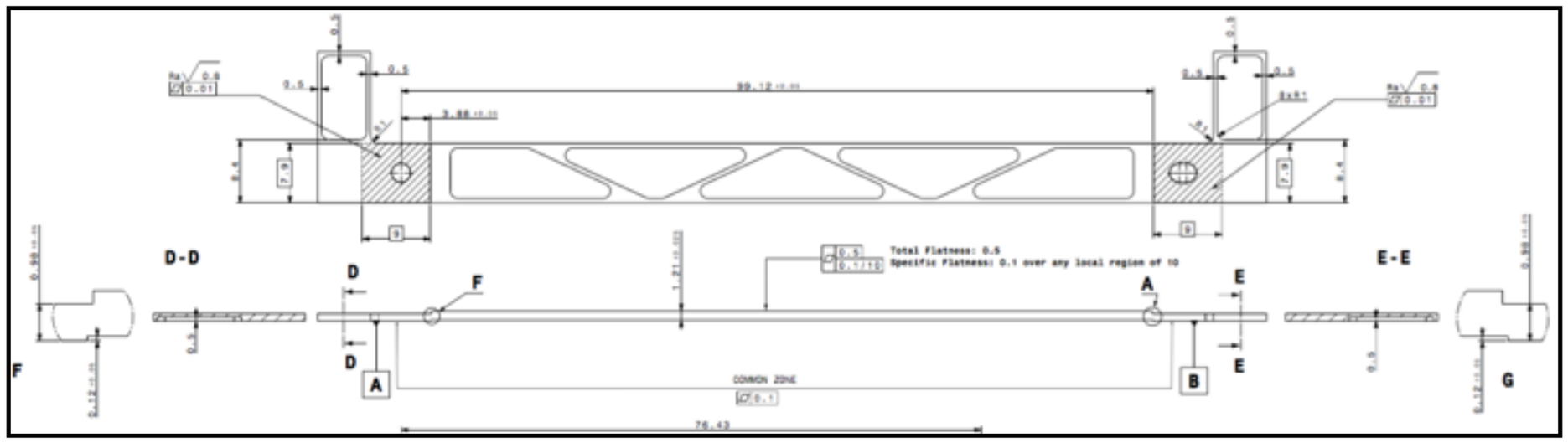
Module prototyping prep

- Have to commission the lab:
  - test set-ups for component testing -> talk Bugra
  - clean room -> Jorgen
  - tooling -> next slides



Jigs production

- Investigating producing jigs in China
- 1 company (UYEE) selected
- Ordered Al spacers as first step to qualify this company
- Will qualify these pieces using CMM system at ULB or VUB
- If they are within requirements will start ordering the jigs



Metrology set-up

- Sensor to sensor alignment has to be measured to qualify assembly procedure

- KIT and Aachen have dedicated optical measurement set-ups for this

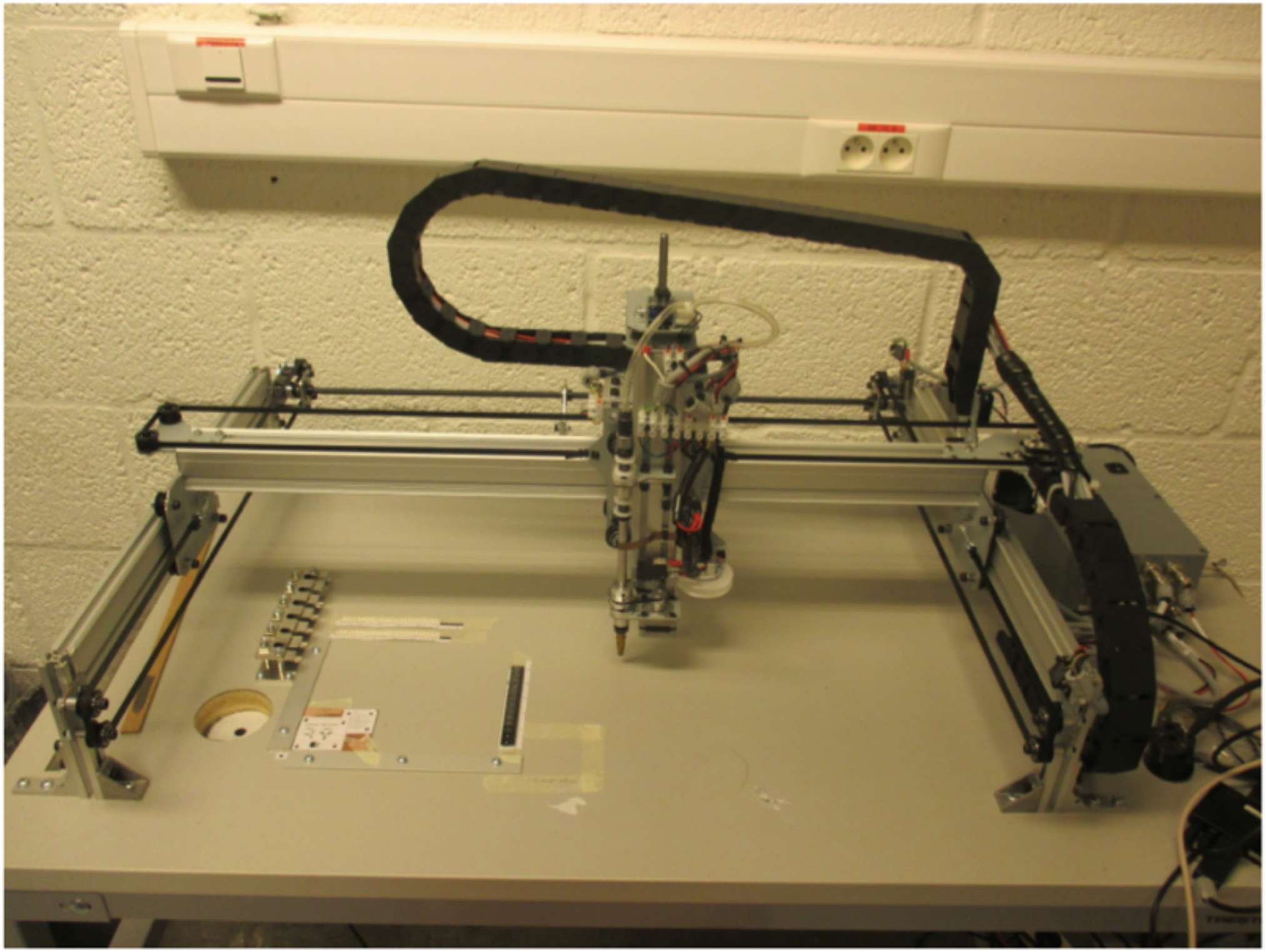
- Can we do it with a simple stereo microscope or do we need a dedicated set-up? -> Annemie Morel and Emil Bols are investigating this

Glue dispensing

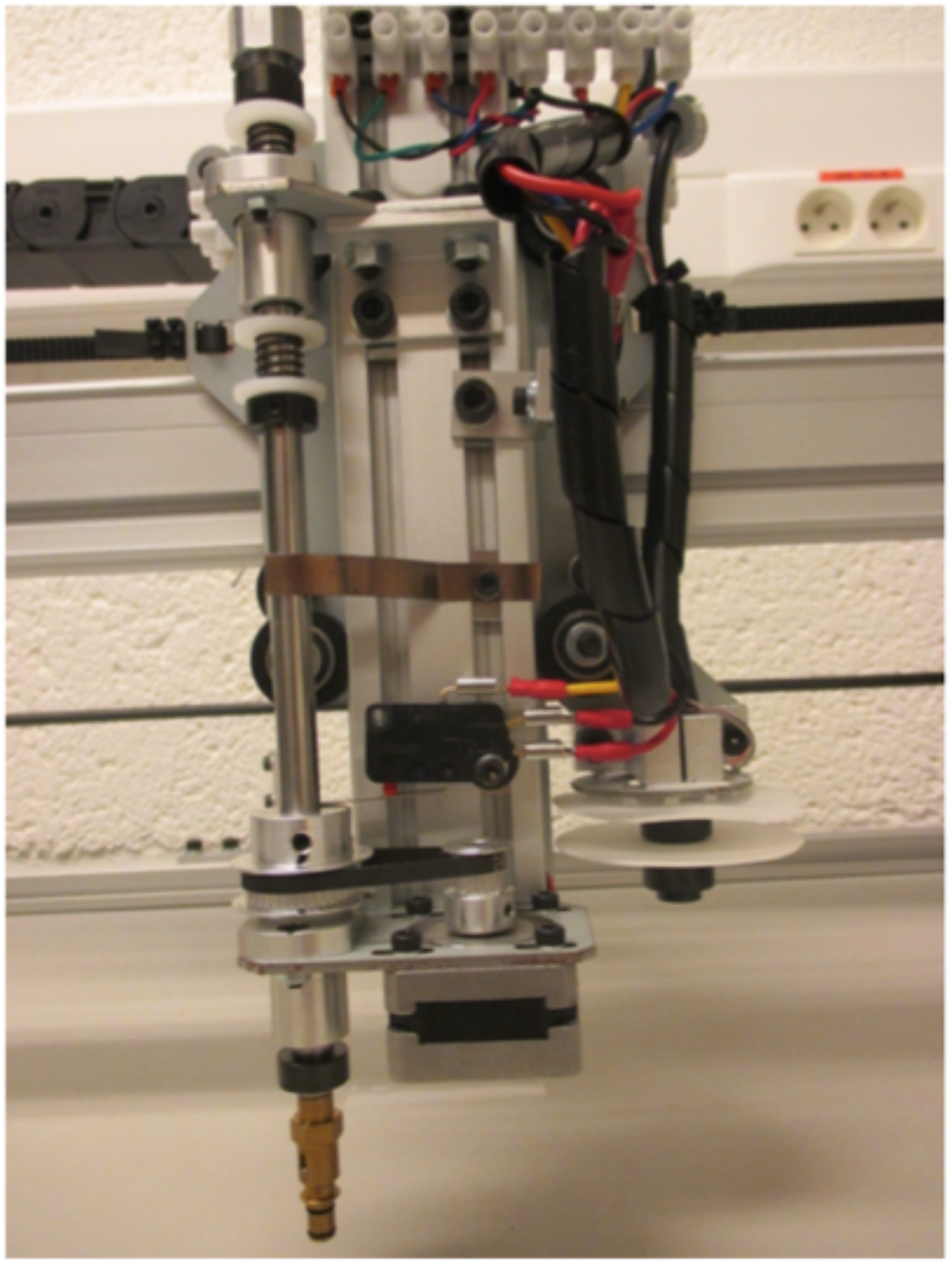
- 1 of the steps which can be automated is the glue dispensing for gluing the kapton to the sensors

- Yannick Allard and Michael Korntheuer are looking into this -> next slides on behalf of Michael and Yannick, thanks!

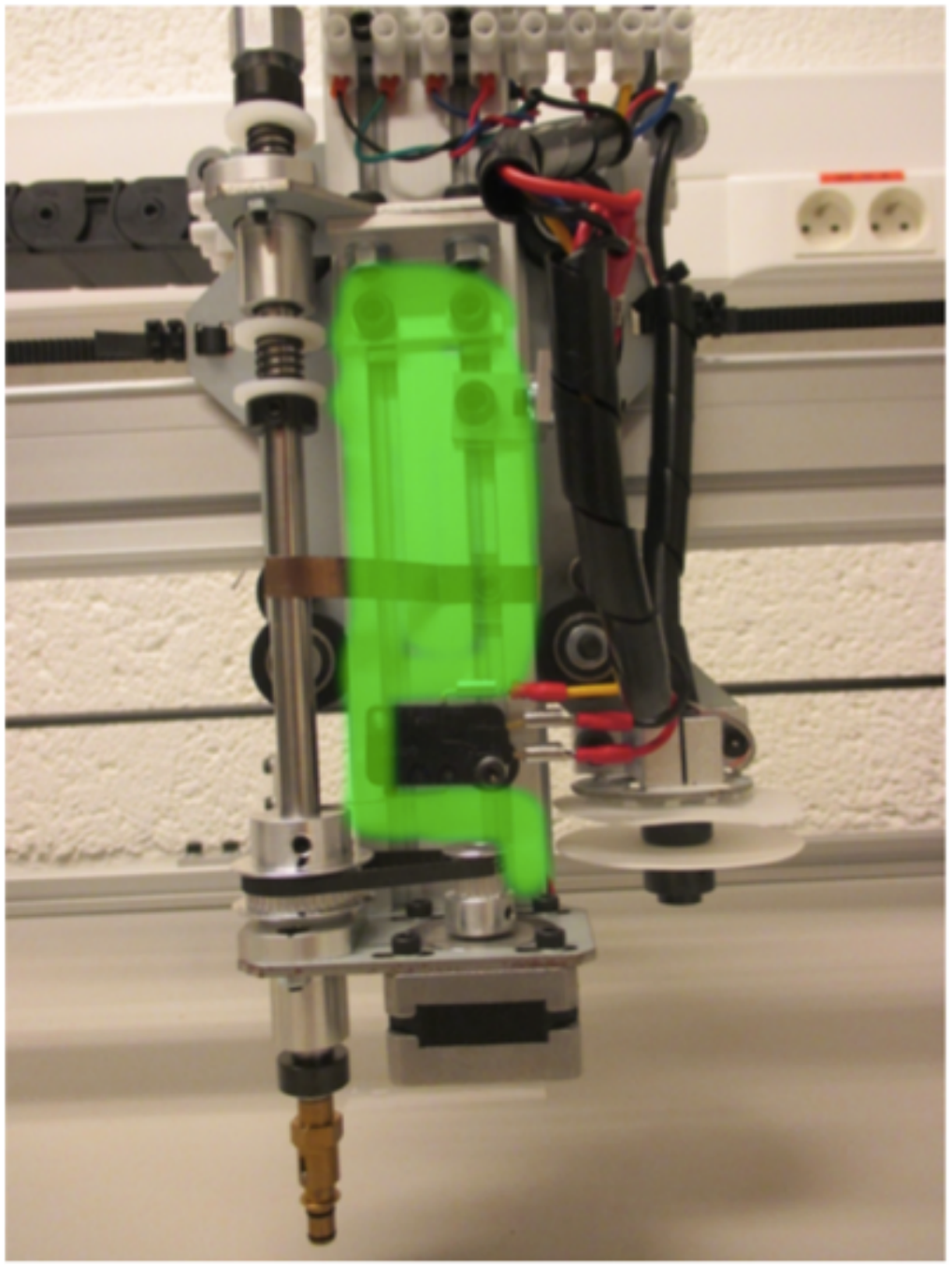
XYZ machine:



XYZ machine:

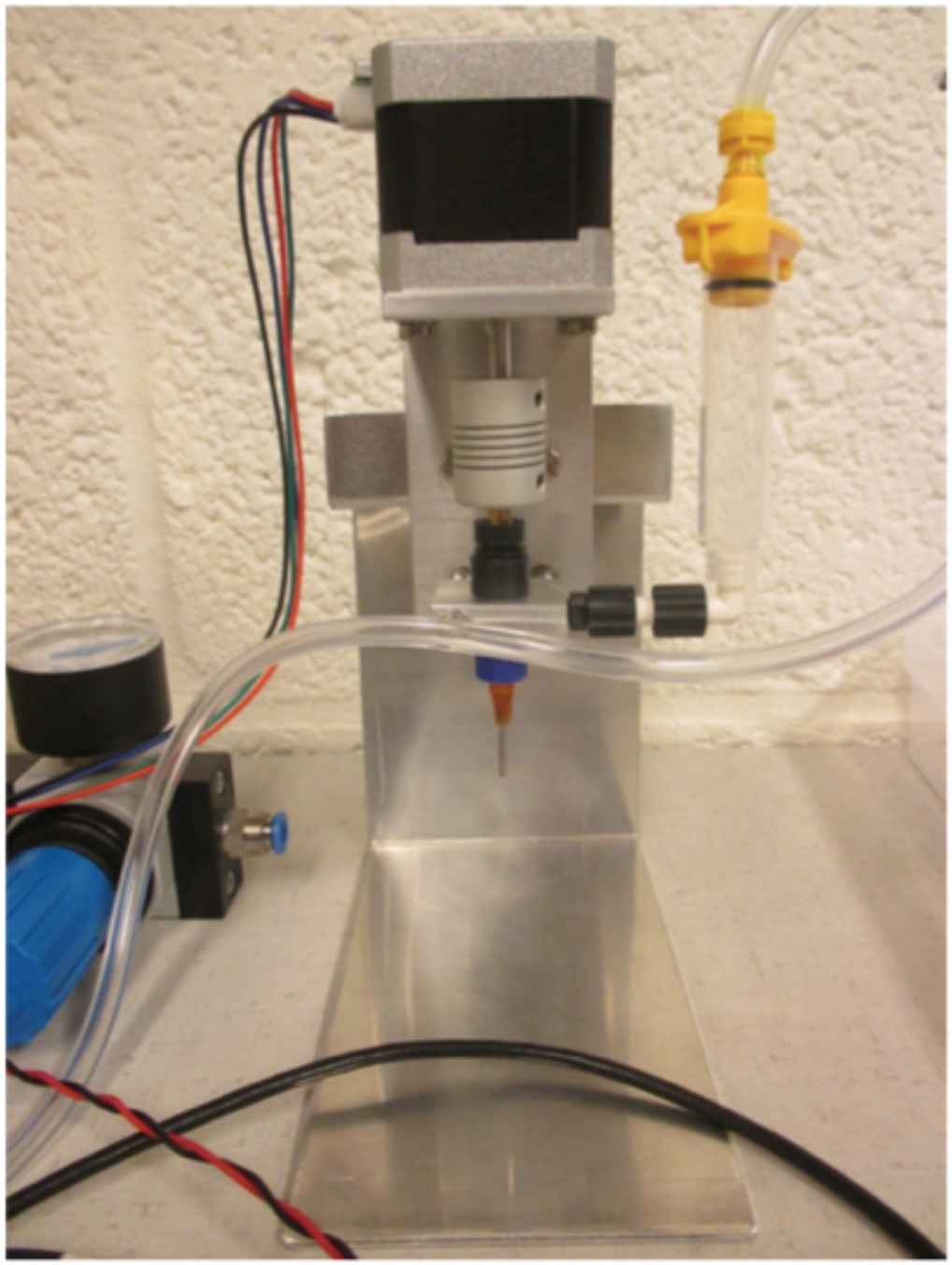


XYZ machine:



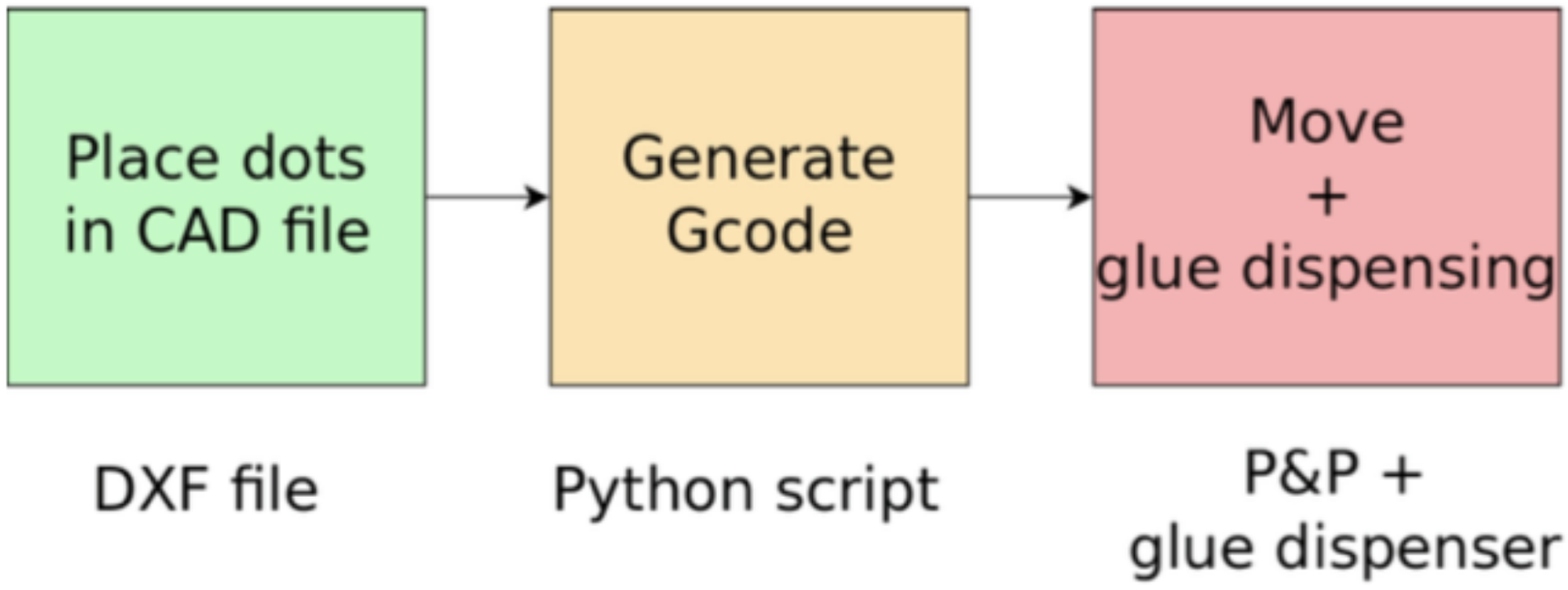
Glue dispenser will be attached to green part

Glue dispenser



Workflow

1. Place dots in DXF CAD file[1]
2. Extract dots location from CAD file
3. Generate XYZ moves in Gcode
4. Generate glue dispensing commands
5. Send commands to the XYZ machine + glue dispenser



[1] Example in backup slides

Status

done placing the glue dots in a DXF CAD file

done generating the Gcode from the CAD file[2]

pending moving the machine: (calibration issue, but custom Gcode send to the machine for basic moves)

untested dispensing the glue

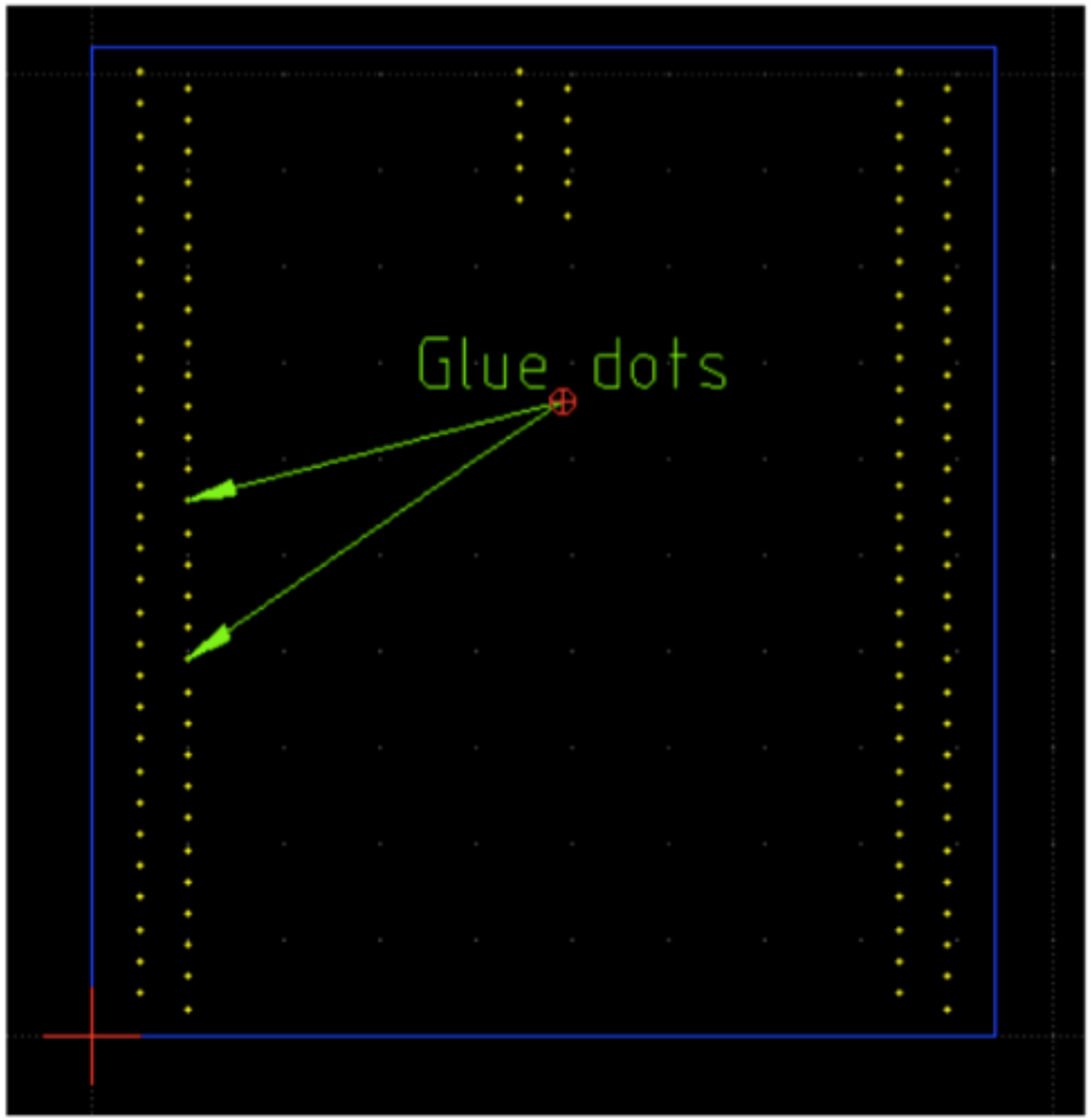
to do attaching the dispenser to the XYZ machine

to do integrate glue dispenser in software

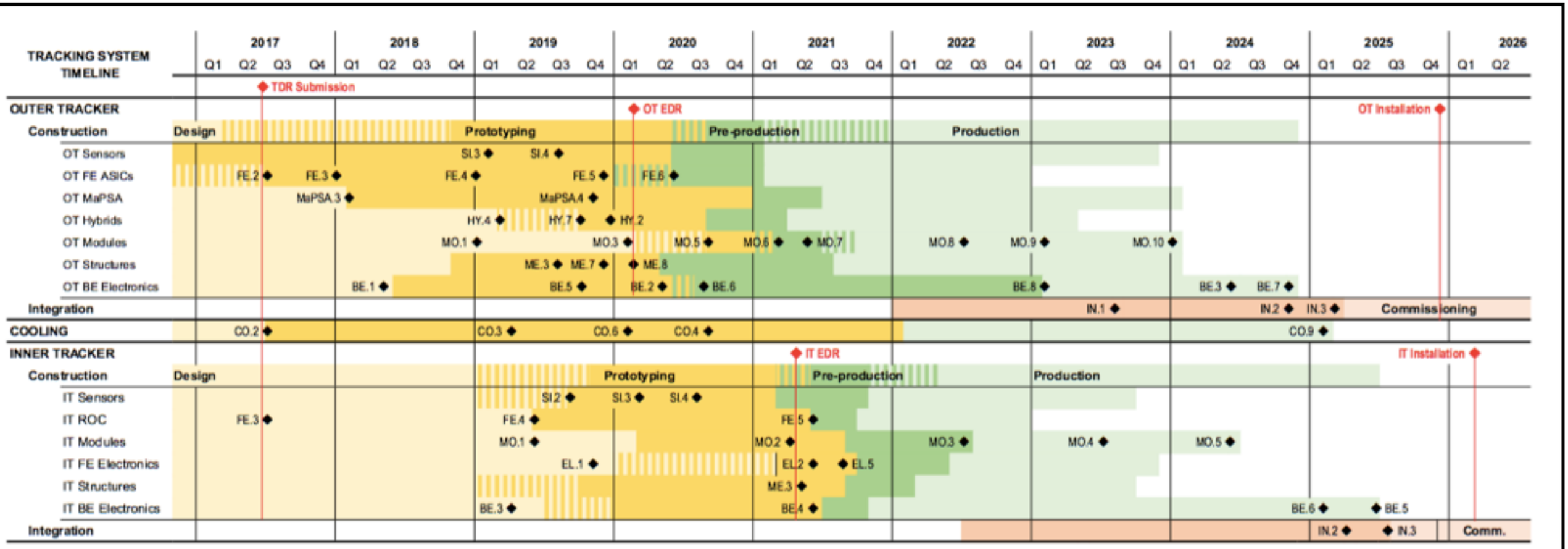
to do dispense all dots of glue (before curing)

[2] Adjustements expected after testing

DXF file view



DXF format: standard for CAD drawings (autocad, librecad...)


TRACKING SYSTEM TIMELINE
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Q1 Q2 Q3 Q4
TDR Submission
OUTER TRACKER
OT EDR
OT Installation
Construction
Design
Prototyping
Pre-production
Production
OT Sensors
SI.3
SI.4
OT FE ASICs
FE.2
FE.3
FE.4
FE.5
FE.6
OT MaPSA
MaPSA.3
MaPSA.4
OT Hybrids
HY.4
HY.7
HY.2
OT Modules
MO.1
MO.3
MO.5
MO.6
MO.7
MO.8
MO.9
MO.10
OT Structures
ME.3
ME.7
ME.8
OT BE Electronics
BE.1
BE.5
BE.2
BE.6
BE.8
BE.3
BE.7
Integration
IN.1
IN.2
IN.3
Commissioning
COOLING
CO.2
CO.3
CO.6
CO.4
CO.9
INNER TRACKER
IT EDR
IT Installation
Construction
Design
Prototyping
Pre-production
Production
IT Sensors
SI.2
SI.3
SI.4
IT ROC
FE.3
FE.4
FE.5
IT Modules
MO.1
MO.2
MO.3
MO.4
MO.5
IT FE Electronics
EL.1
EL.2
EL.5
IT Structures
ME.3
IT BE Electronics
BE.3
BE.4
BE.6
BE.5
Integration
IN.2
IN.3
Comm.