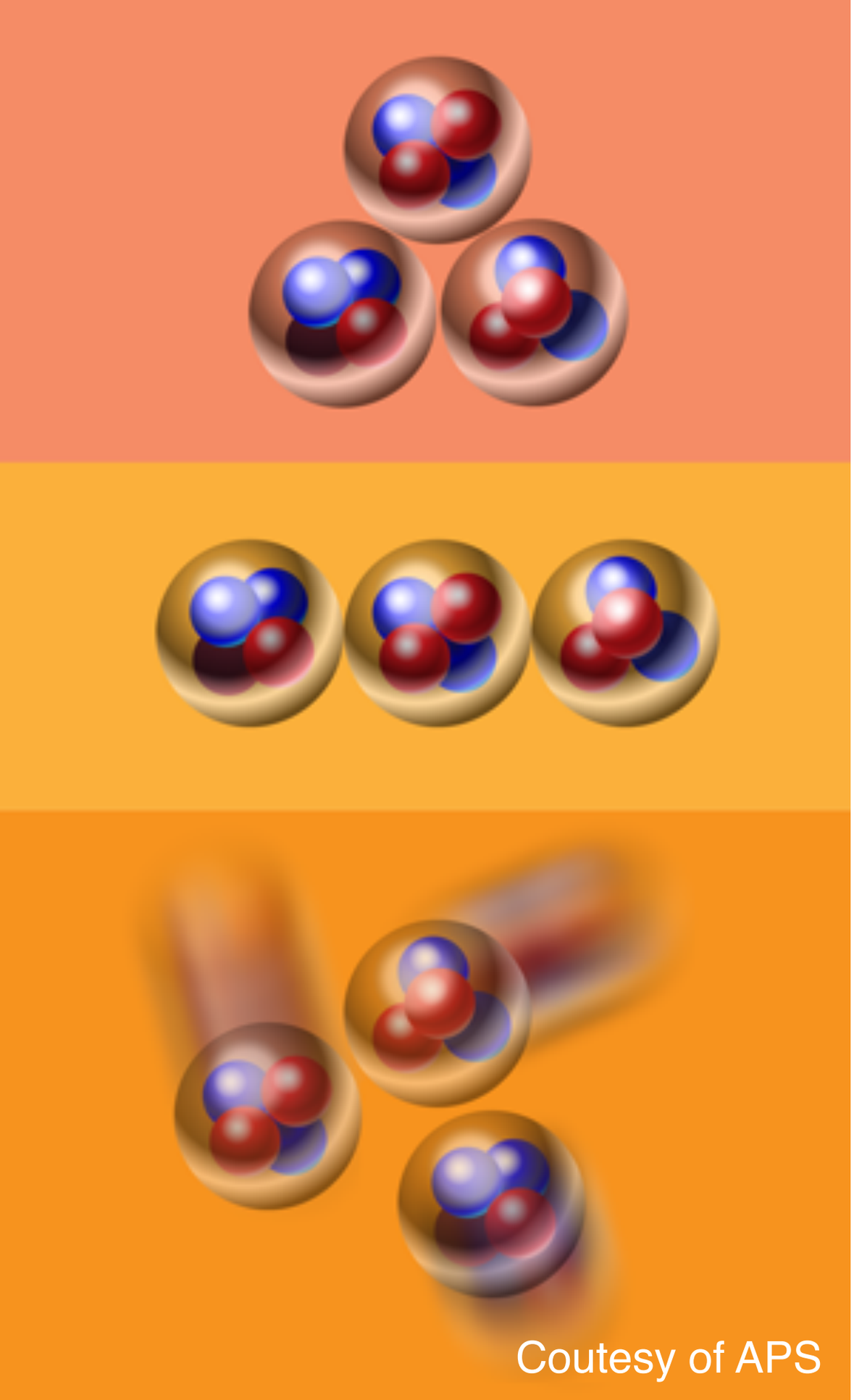


status of **ATTPC**

Outline

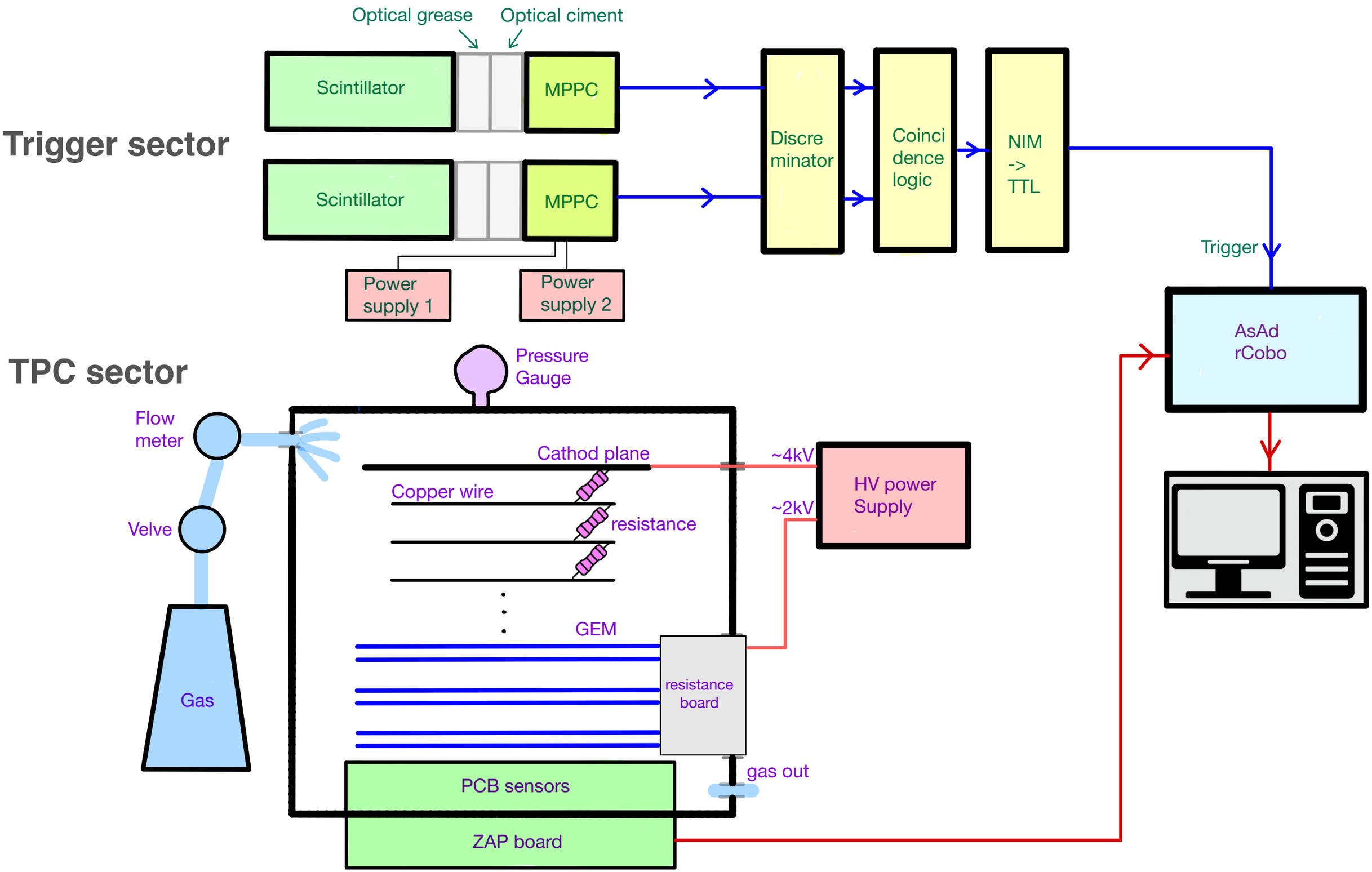
- Status of prototype ATTPC
- Design for main experiment

Yongsun Kim

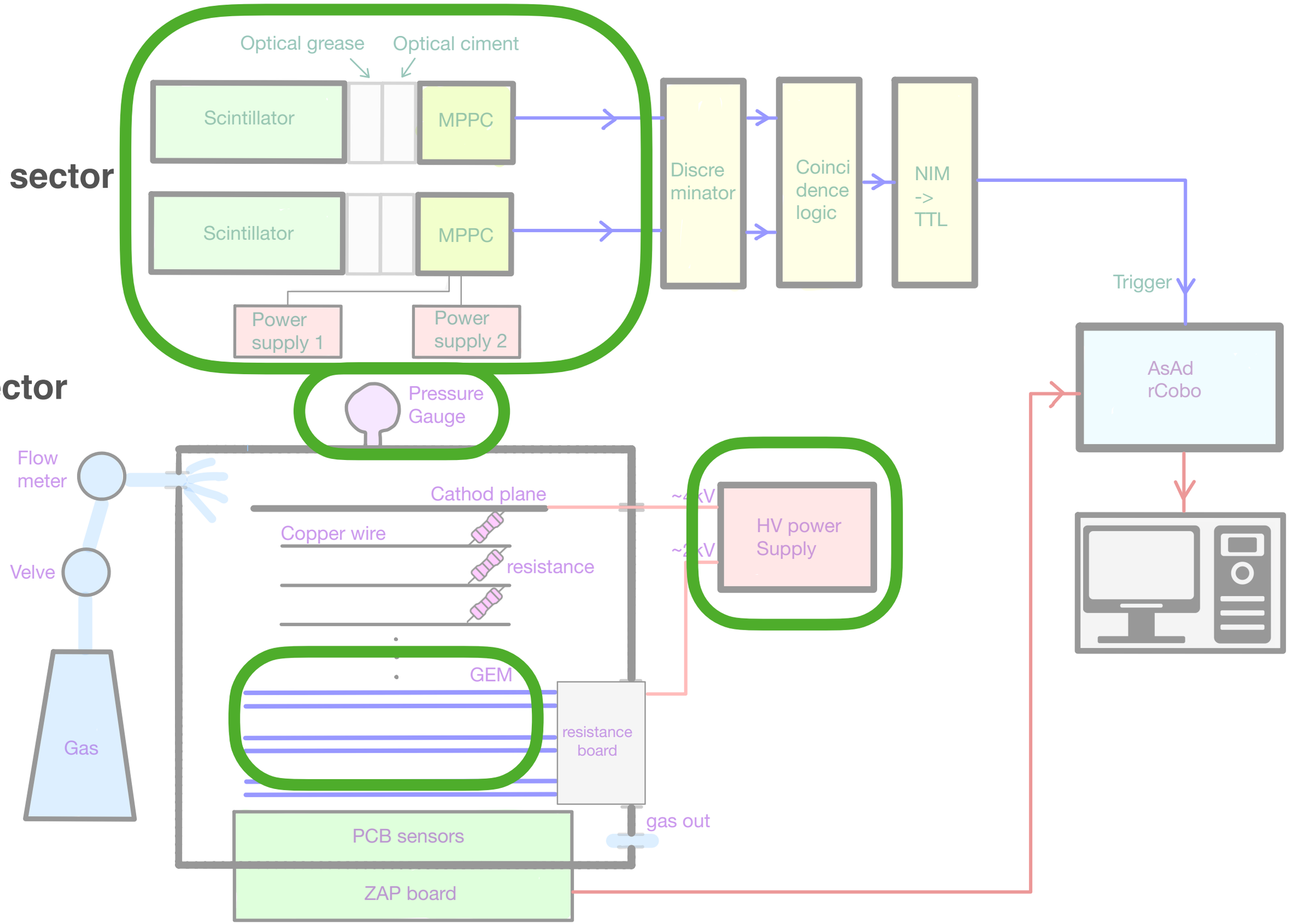
LAMPS meeting

2020.5.15

Schematic design of prototype detector

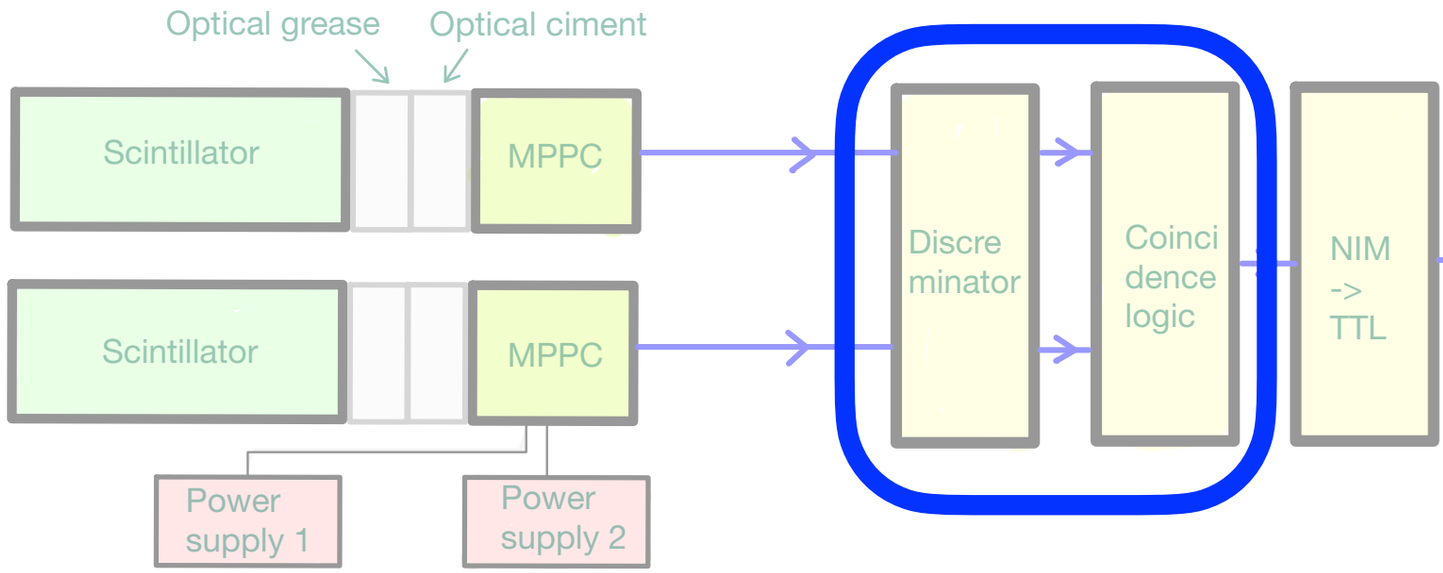


Validated items

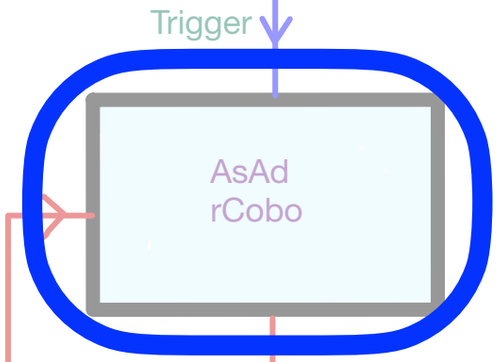


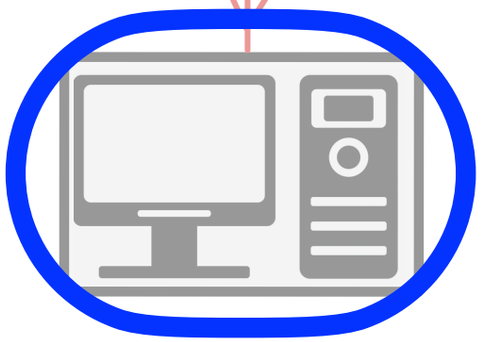
Items to be setup and tested

Trigger sector



Trigger acceptance



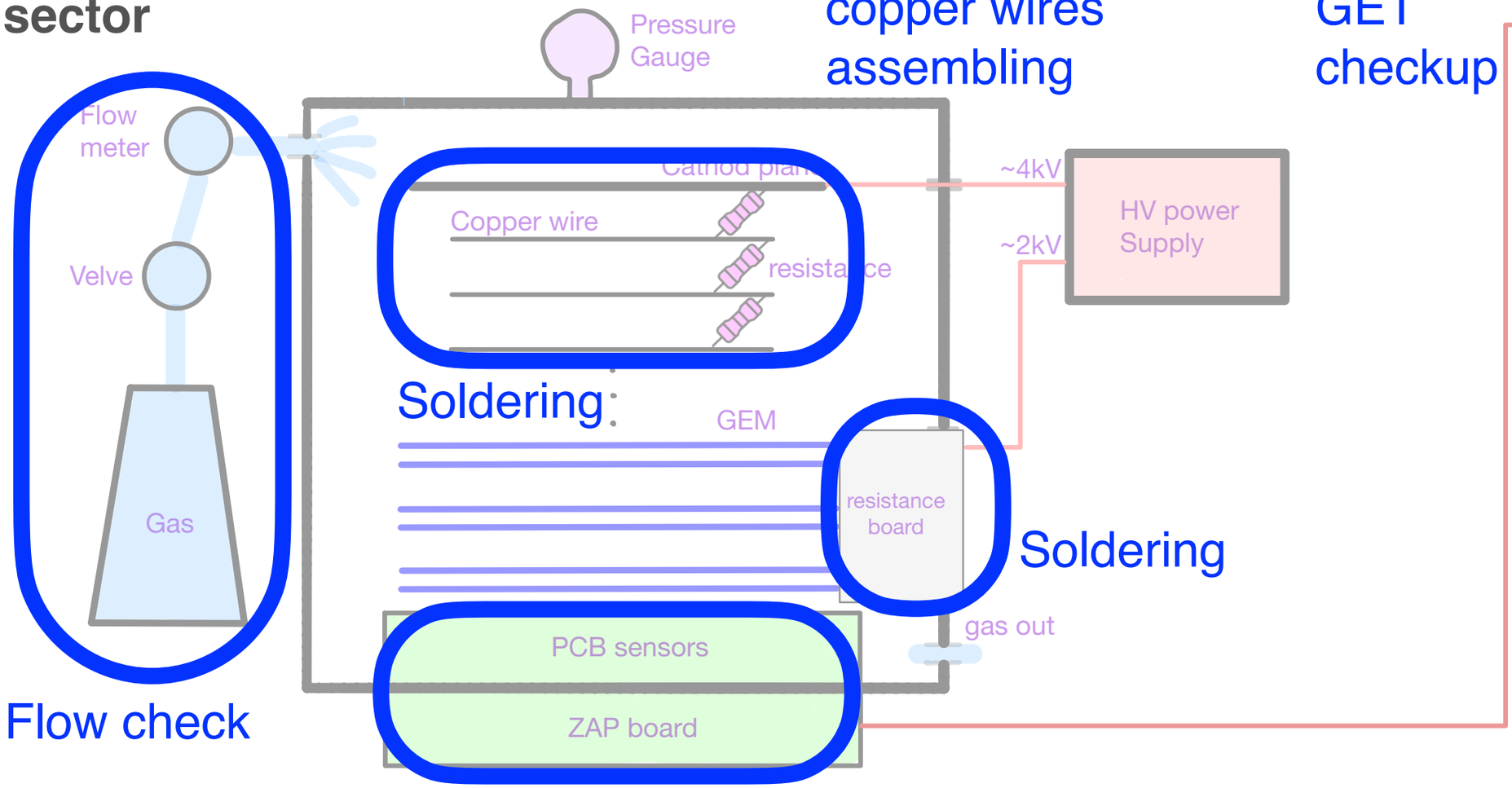


Analysis w/ mock data

TPC sector

copper wires assembling

GET checkup



Flow check

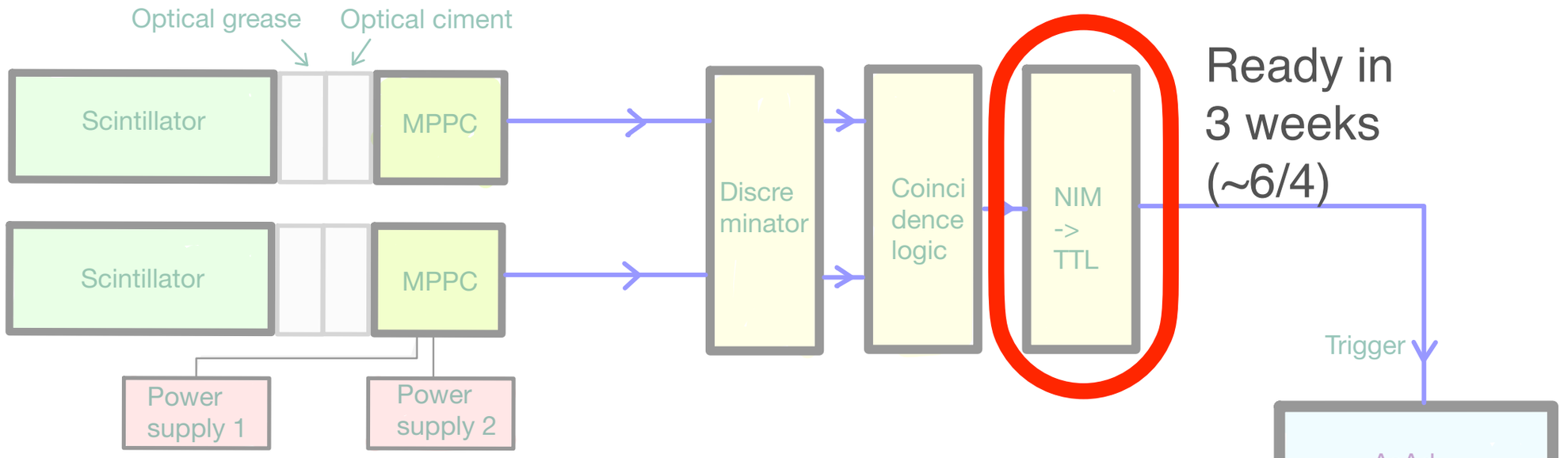
Soldering:

Soldering

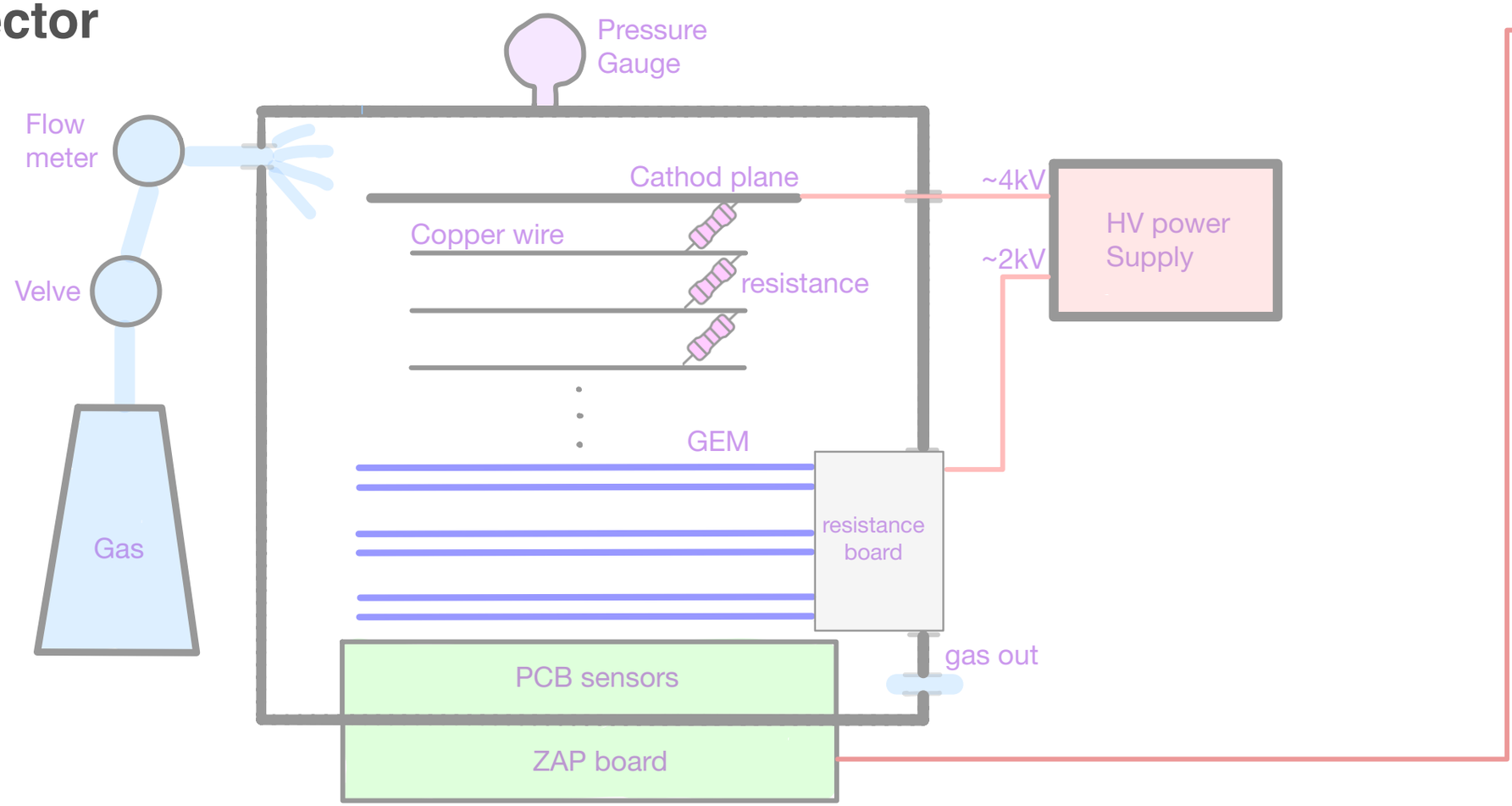
Probing signals by oscilloscope

Missing item

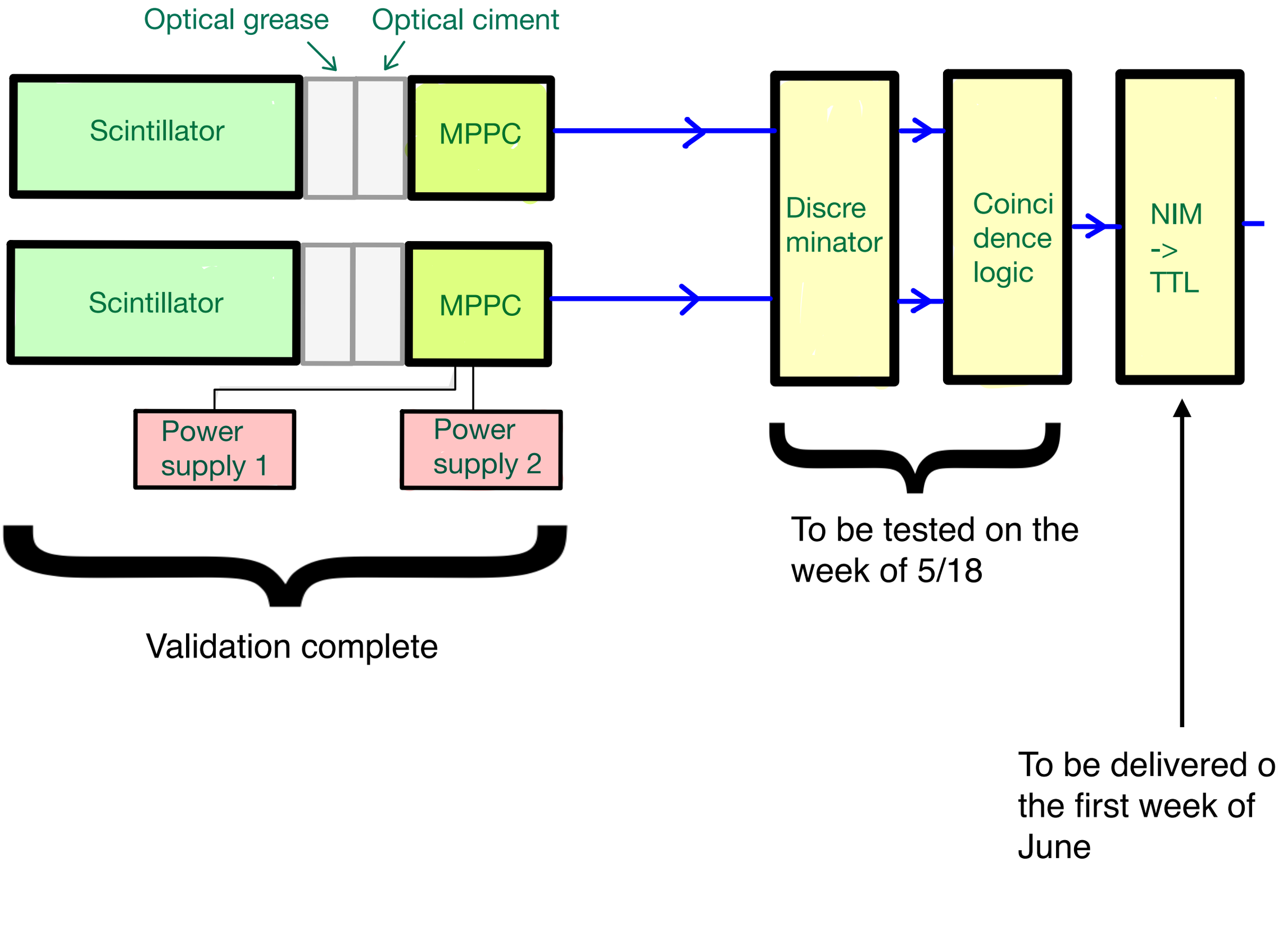
Trigger sector



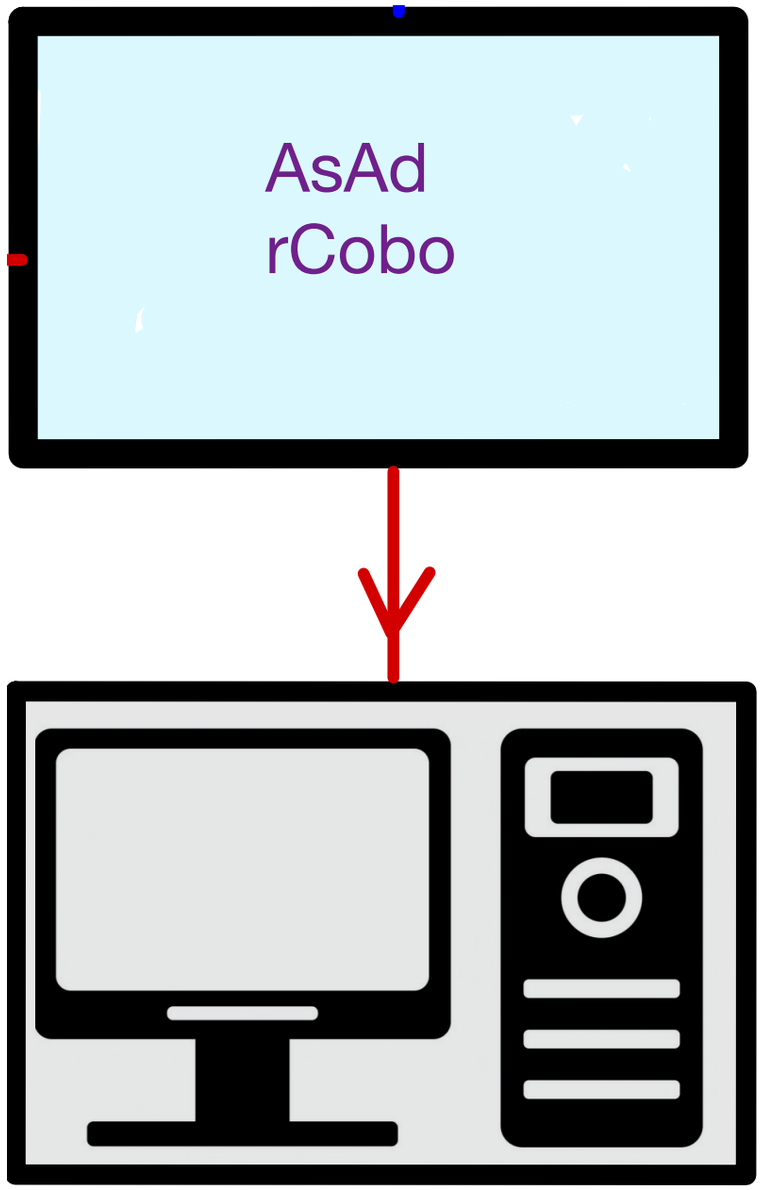
TPC sector

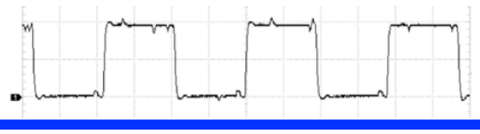


Trigger system



Trigger system test and data gymnastics



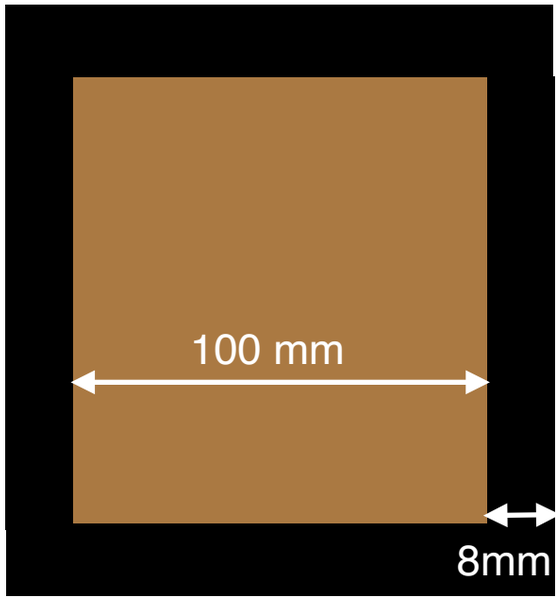


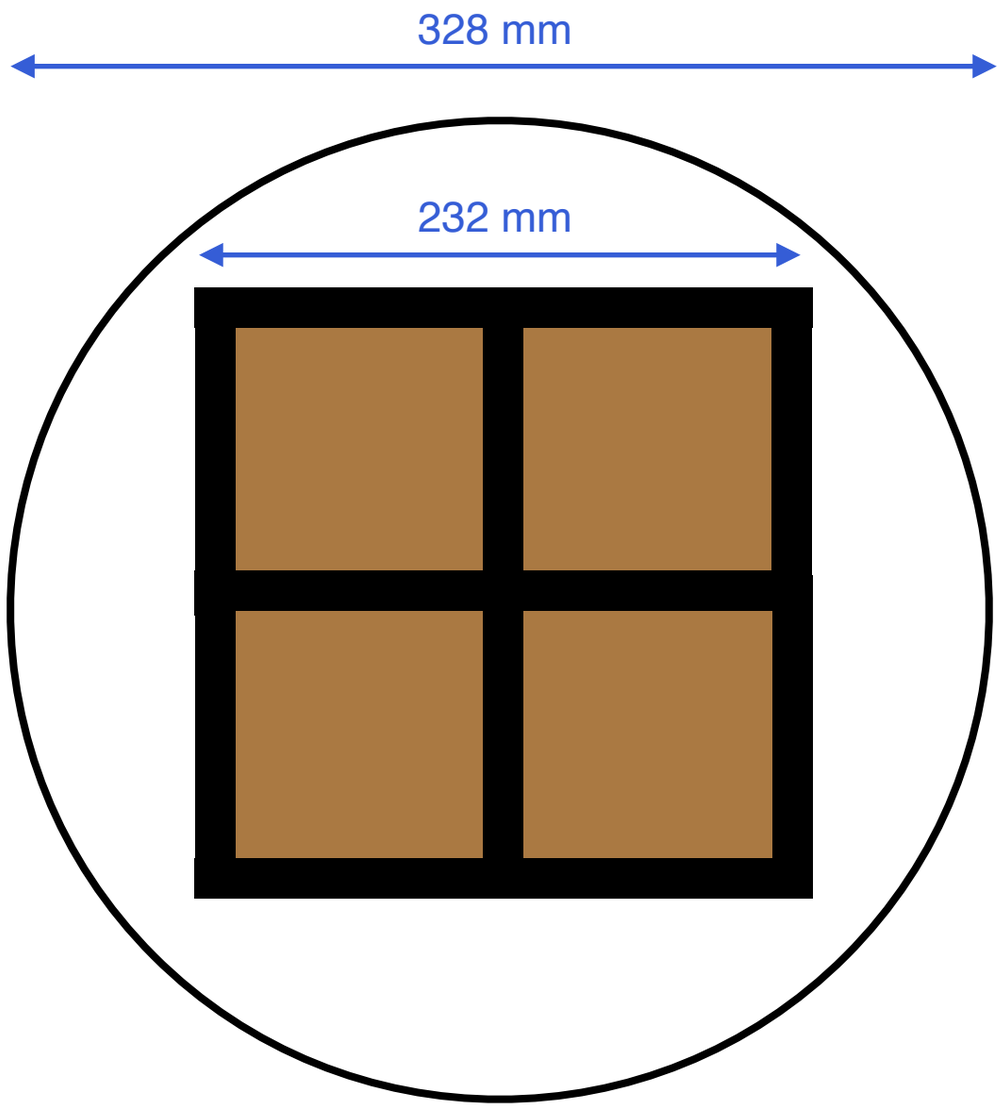
Pulse generator will be used to feed in the TTL signals until NIM2TTL module is delivered

- GET software install complete
- Null events will be analyzed to study the data formate and to understand the backgrounds

Status of GEM

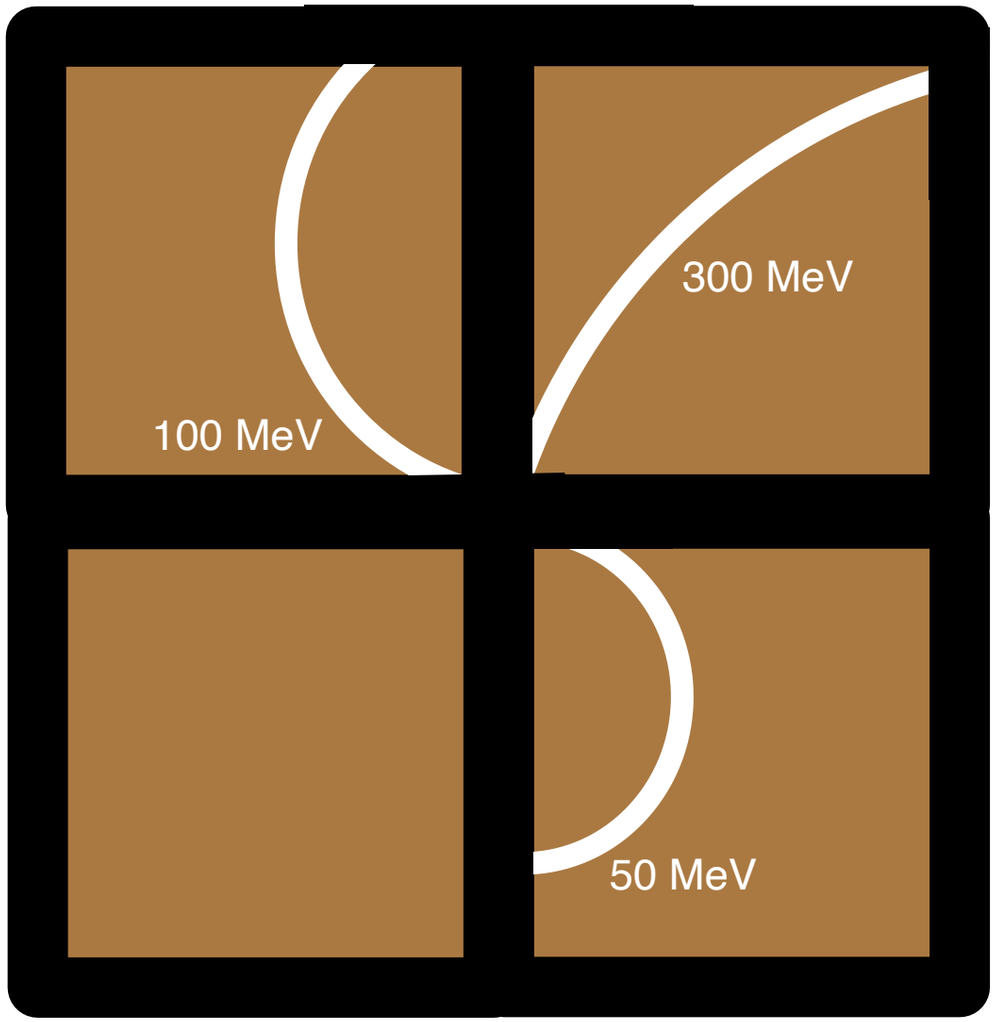
- Large square GEM
  - CERN does not produce 20x20 mm^2 GEM
  - Expanse for making a new mask is same regardless of the shape
  - MEKARO suggested to combine 4 10x10 foils



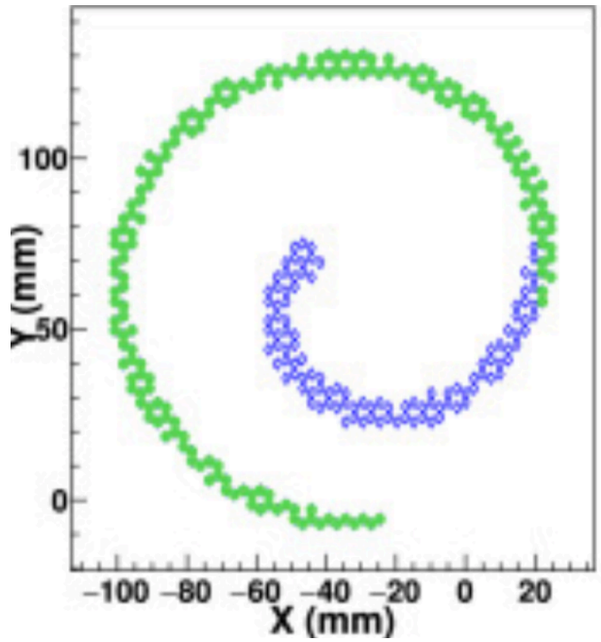


PCB design

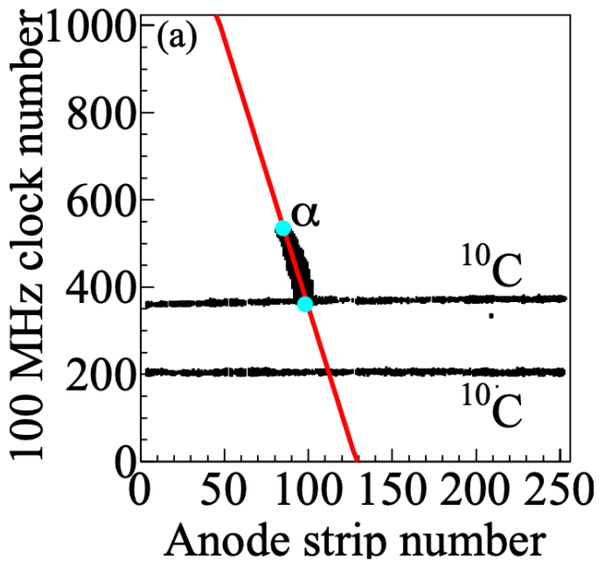
- **Typical radius of α tracks for B = 1.5 T**
  - E_K = 10 MeV
  - p = max of p_T = 270 MeV
  - R = 30 cm



- For a concrete strategy based on quantitative foundation, the most urgent is the simulation studies



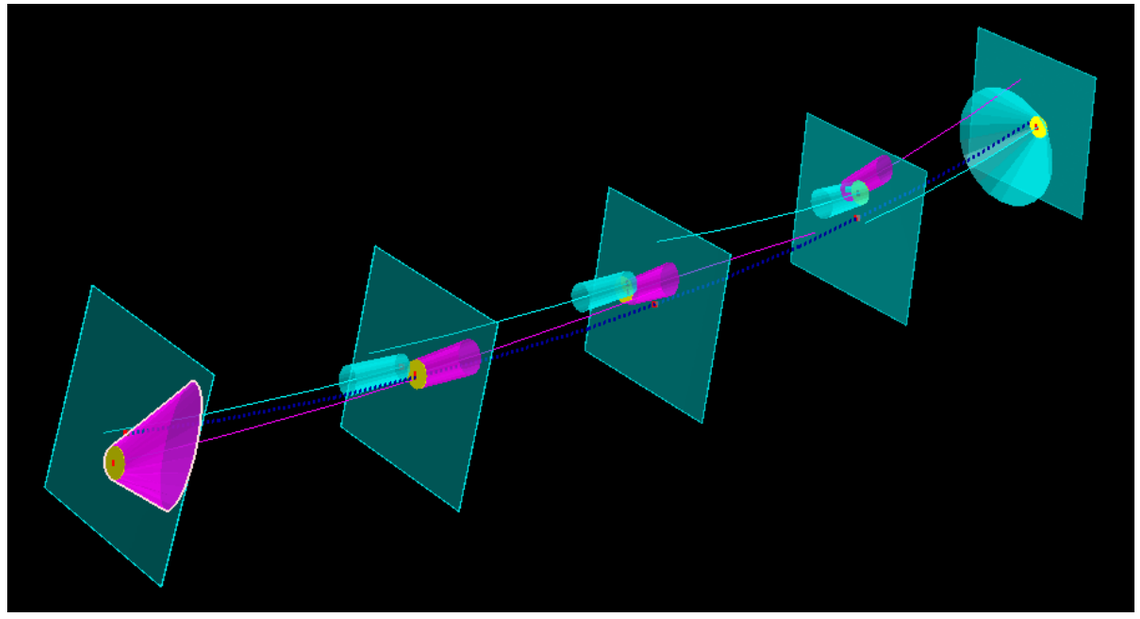
Tracks in NSCL ATTPC
NIM A 954 (2020)



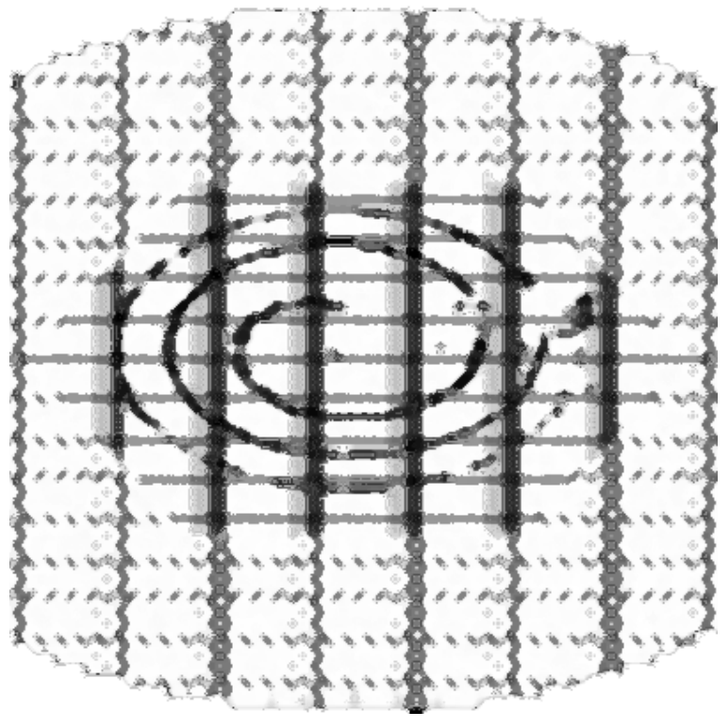
MAIKO experiment track under 500 hPa

Candidate packages for LAMPS ATTPC

- GENFIT
  - Generic tool for reconstruction of tracks
  - Kalman filter and Deterministic Annealing filter for clustering
  - Associated with RAVE
  - Easy to be implemented
  - Deployed in PANDA, sPHENIX

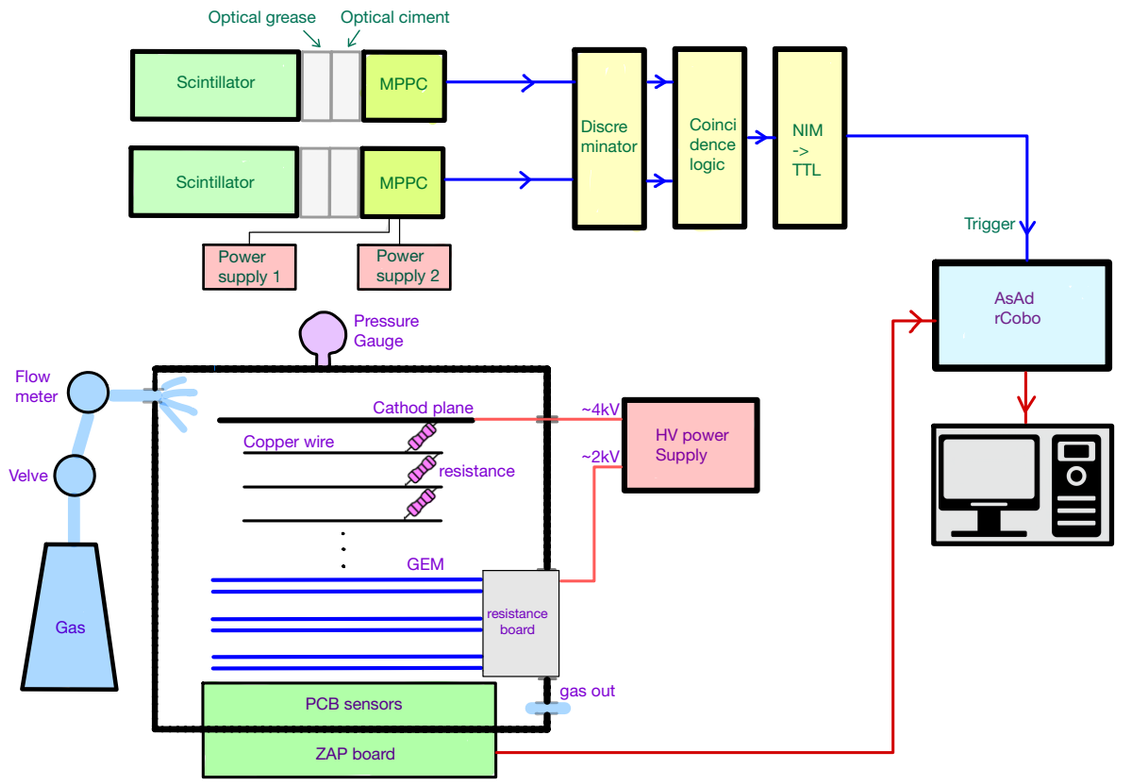


- ATTPCROOT
  - Larger package covering detector simulation and data analysis
  - Developed for NSCL ATTPC
  - Virtual Monte Carlo packages and tracking modules
  - Depends on FairROOT and FairSoft libraries



Summary

- Construction of prototype ATTPC is on track
  - Quality check for components in May
  - Cosmic data taking in June at the earliest



- More time and effort will be given for the TPC simulation and software development