

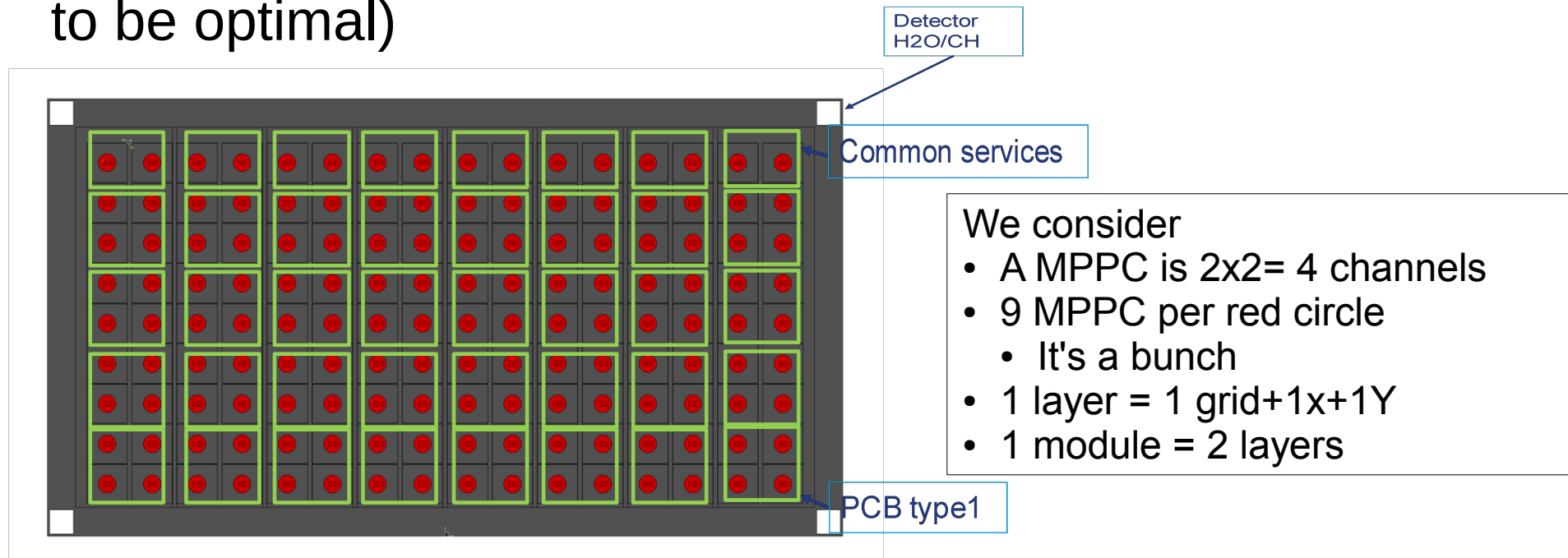
WAGASCI

Electronic part Preliminary work

Remark : this design is similar to the topology used for CALICE SiW-ECAL

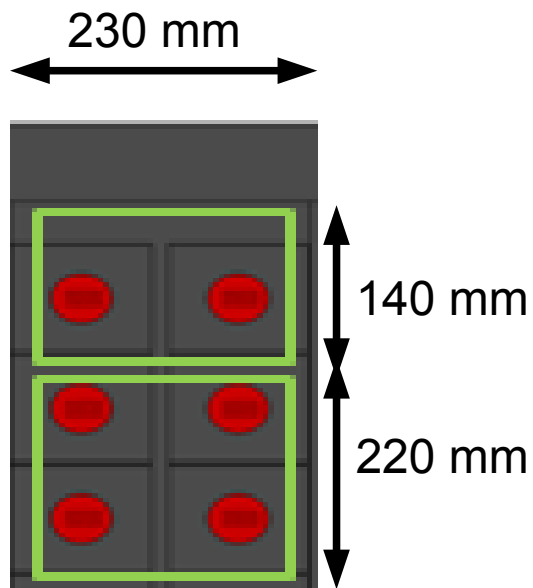
Reflexion about the card format

- Following the design supply by Alain (1st option that seem to be optimal)

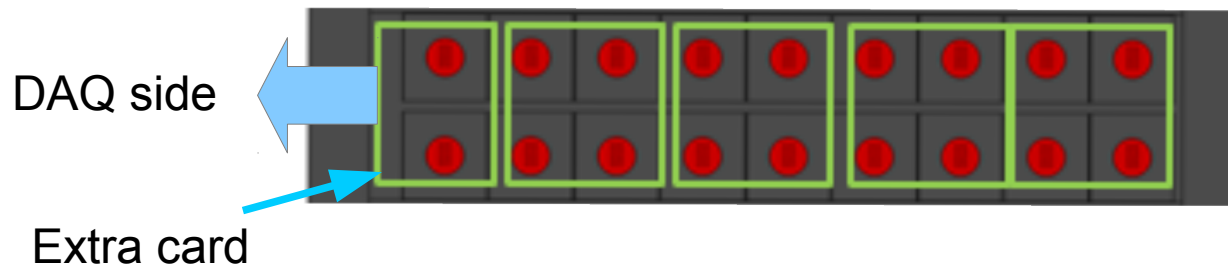


Side of the detector : 144 SPIROC2B par side (same thing on top)

Reflexion about the card format

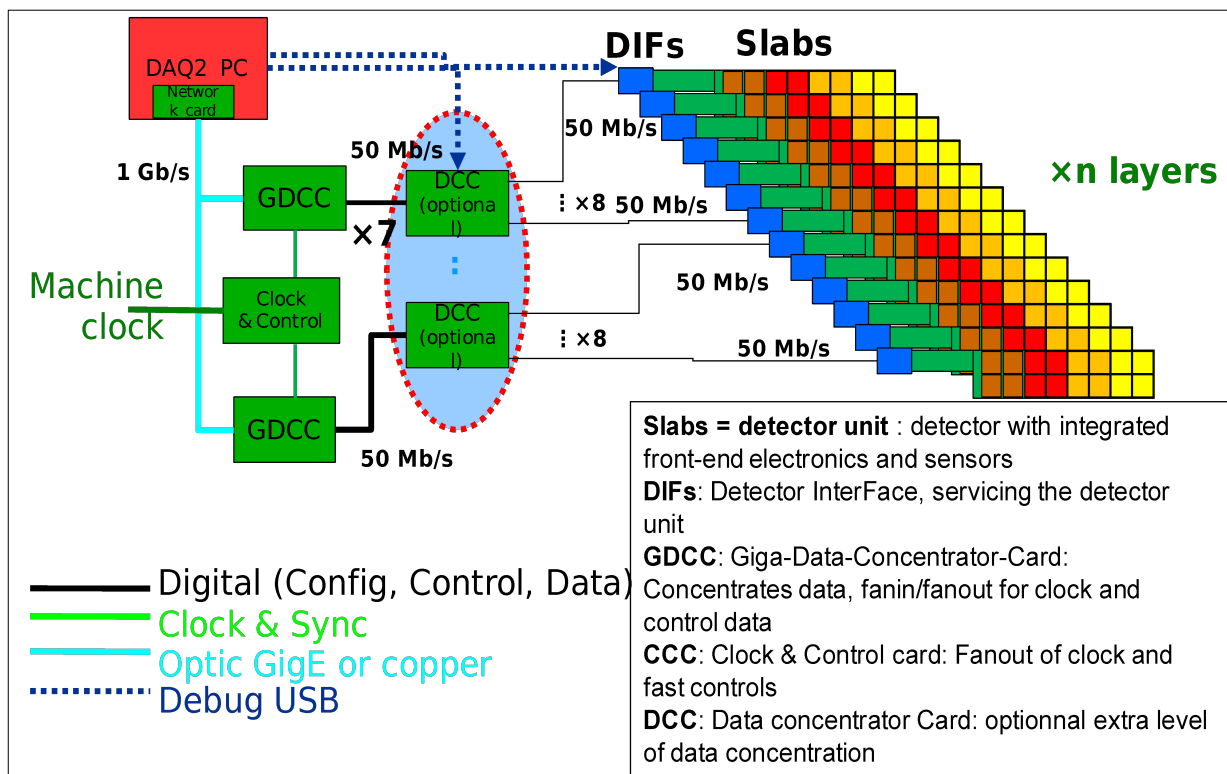


- We propose a card who manage 4 bunchs
- Each MPPC are read by SPIROC Omega ASIC and soldered on the same card (exactly on bottom side)
- Requiring 4 ASICs per card
 - Card name : ASU = Active Sensor Unit
- Thus, we have 4 cards per row + 1 extra card (hybrid ASU)
 - Each card are connected together by a flat cable
 - The ASU card size could be : (230x220) mm
 - The extra card contains 2 SPIROC2B and the line driver chips for the clock and some control signals
 - The size of the extra card could be : (230x140) mm
- From the extra card
 - A flat cable is connected to the lid (isolation for the light) and from here goes to the DAQ chain
 - Need to be investigate to find an optimal solution



Reflexion : overview of the DAQ

- We take our reference from CALICE

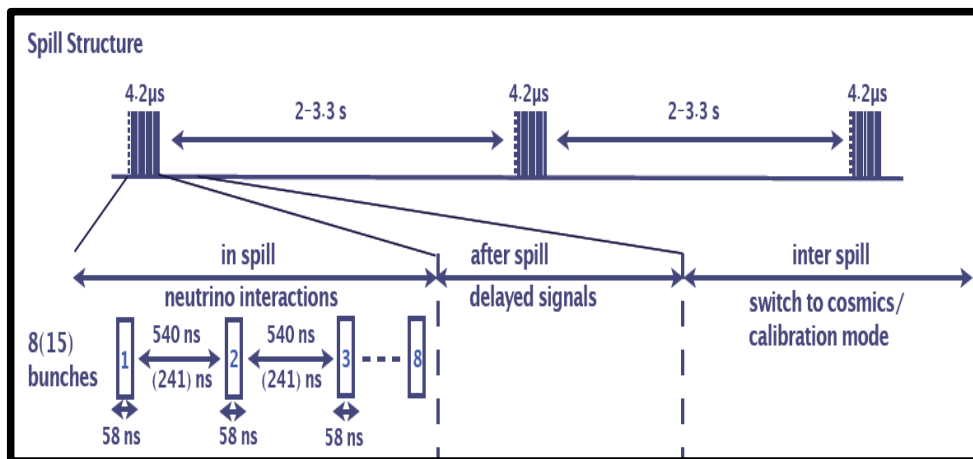


Reflexion : number of card

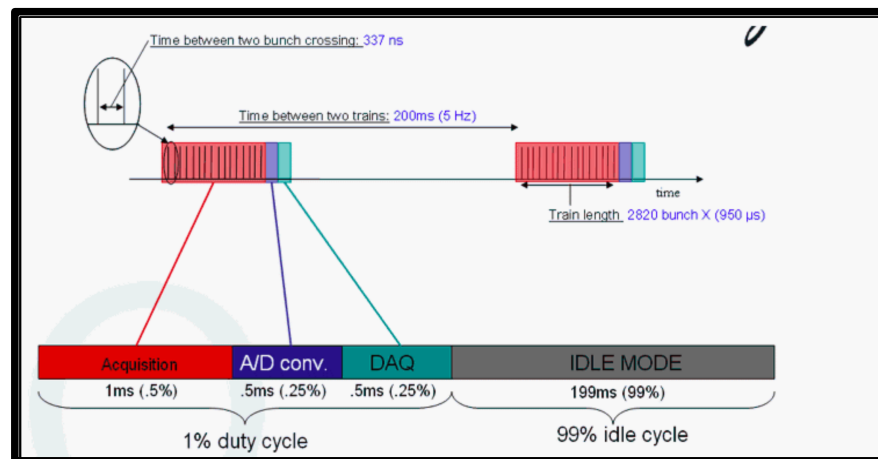
- We have 16 rows on detector (8 on top and 8 on side)
- We need:
 - 4 ASUs per row
 - 1 extra_card/row
 - 1 DIFs/row (outside the detector)
 - Total : 64 ASUs, 16 extra_card, 16 DIFs
- For the DAQ
 - 2 options
 - With DCC : we need 2 DCC and 1 GDCC
 - Without DCC: We need 3 GDCC

Reflexion : electronic dissipation

- On T2K the spill structure looks like at the ILC structure



T2K structure (to be confirmed)



ILC structure

With this structure, we can put in place the power pulsing system

SPIROC in mode normal : ~3,6 W

SPIROC in mode power pulsing : ~500mW

Reflexion : Conclusion

- Open question...
 - Choice of MPPC
 - Need a temperature monitoring
 - Power pulsing or not
 - Approve or not the ASU design
 - The same electronic architecture can be used for the MRD
- Meanwhile (waiting the green light from our direction), we foresee to put in place:
 - A setup of the DAQ system with a CALICE ASU and 4 SPIROC 2B Chip
 - Configuration and read-out test
 - A setup of the DAQ system with a CALICE ASU and 1 SPIROC 2B with one/few SiPM