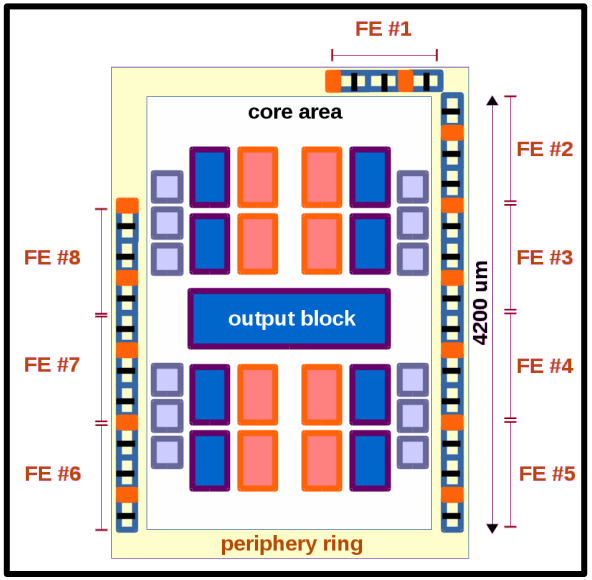
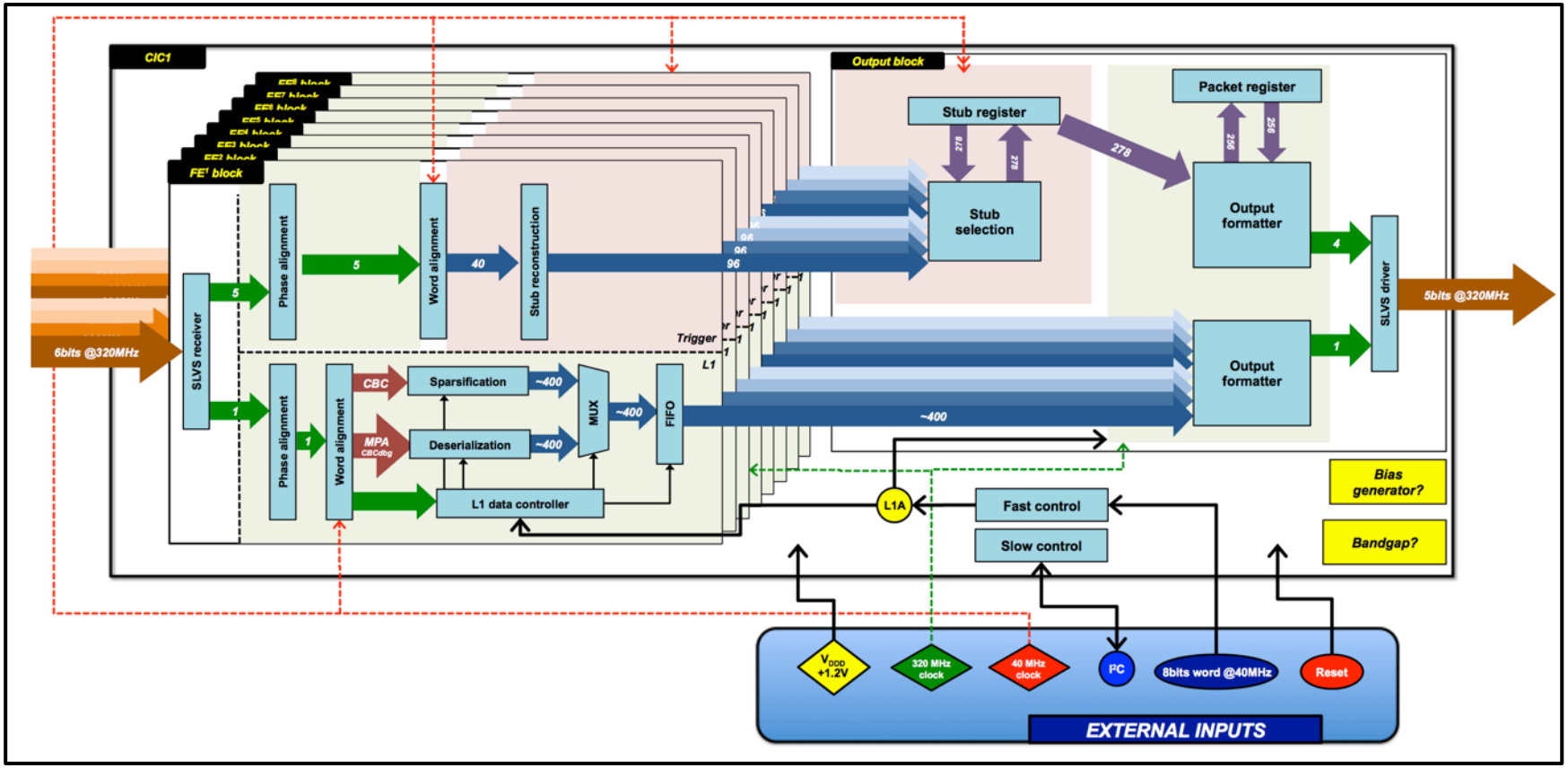
CIC status



Chip status

L.Caponetto, G.Galbit, S.Viret, Y. Zoccarato
IPN Lyon

→ CIC1 block diagram:



→ **Model status and tests:**

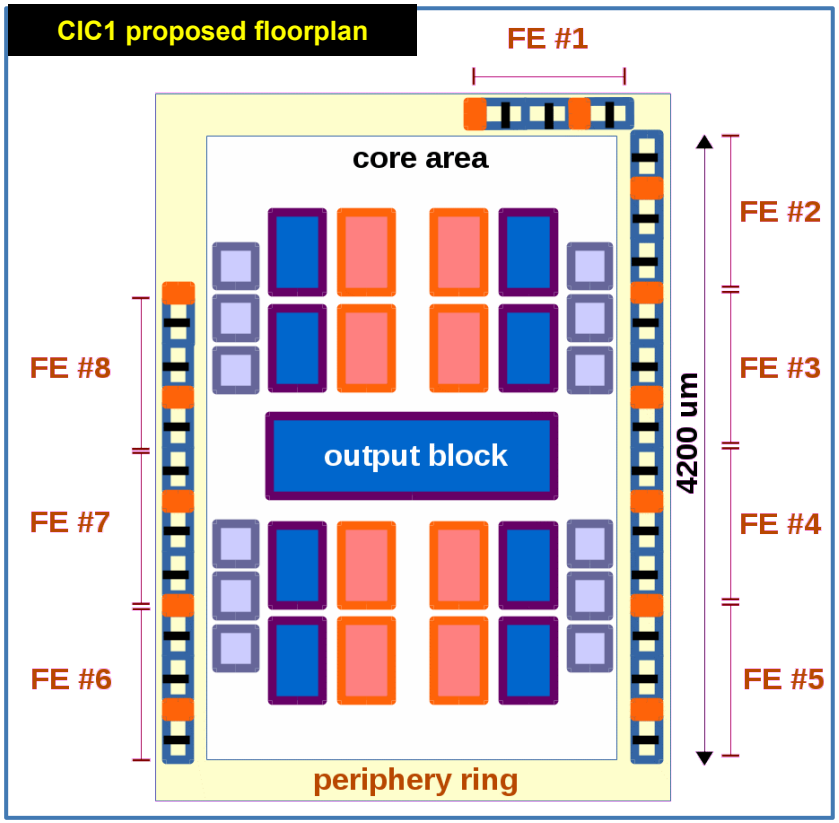
→ Inclusion of the pattern generator. I^2C slave about to be added.

→ Addition of de-skewing capabilitiy for each input line (*necessary in addition to the phase aligner*).

→ Test tool from CMSSW stimuli was fully automatized (*python framework*), in order to speed up the verification process

→ Started to evaluate the model porting from SysVerilog to Verilog in order to use CERN triplication tool.

→ Model and design status:

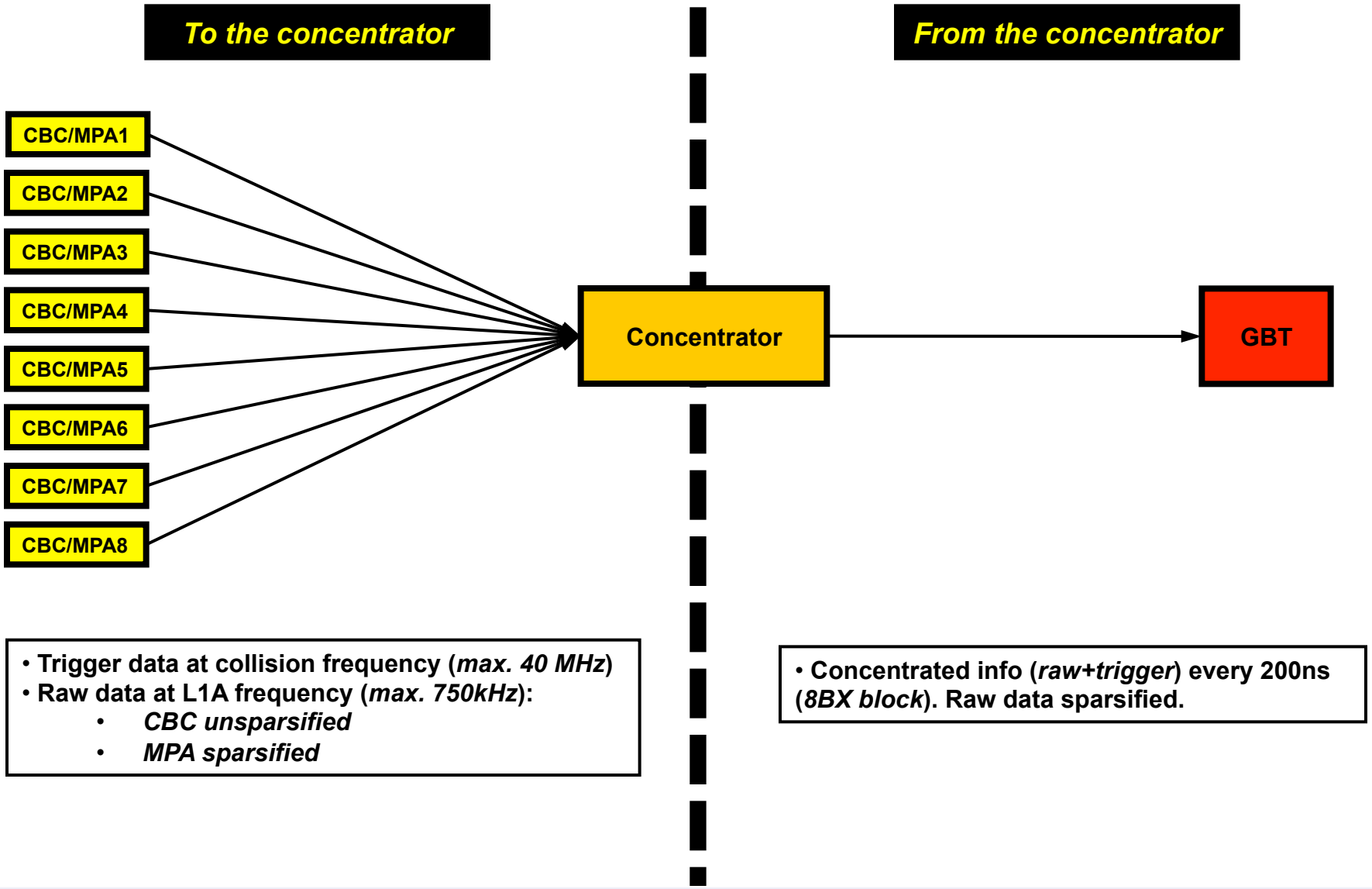


→ Synthesis of 1FE block (*core+FIFO*) done.

→ Need to add the phase aligner block (*have to check if the block designed for the GBT can be used as it stands*).

→ Concerning the design, most of the technical points raised during the review have been solved.

→ Remaining points still have to be addressed (*eg ESD pads*)


To the concentrator
From the concentrator
CBC/MPA1
CBC/MPA2
CBC/MPA3
CBC/MPA4
CBC/MPA5
CBC/MPA6
CBC/MPA7
CBC/MPA8
Concentrator
GBT
• Trigger data at collision frequency (max. 40 MHz)
• Raw data at L1A frequency (max. 750kHz):
• CBC unsparsified
• MPA sparsified
• Concentrated info (raw+trigger) every 200ns (8BX block). Raw data sparsified.

→ The data transmission requirements:

→ Raw data (L1) block:

- Full raw data transmission up to 750kHz (*max acceptable L1A rate*)
- No loss accepted *(<0.1%)*

→ Trigger block:

- Full trigger data (*stubs*) transmission up to 40MHz
- ~90% of the stubs transmitted are not used by the L1 track trigger, we can/should accept losses on them.
- We cannot accept too many losses *(<1%)* on the remaining stub (*aka good stubs, coming from particles with p_T>2GeV/c, d_0<5mm*).

➔Documentation available on the sharepoint:

→ Analyse of the potential data transmission losses:
https://espace.cern.ch/Tracker-Upgrade/Electronics/CIC/Shared%20Documents/Simulation%20studies/FE_inneff_2.pdf

→ CIC I/O data formats:
https://espace.cern.ch/Tracker-Upgrade/Electronics/CIC/Shared%20Documents/Data%20formats/CIC_IO_Formats_v5.pdf

→ CIC1 specification document:
https://espace.cern.ch/Tracker-Upgrade/Electronics/CIC/Shared%20Documents/Specifications/CIC_specs_v1.1.pdf