

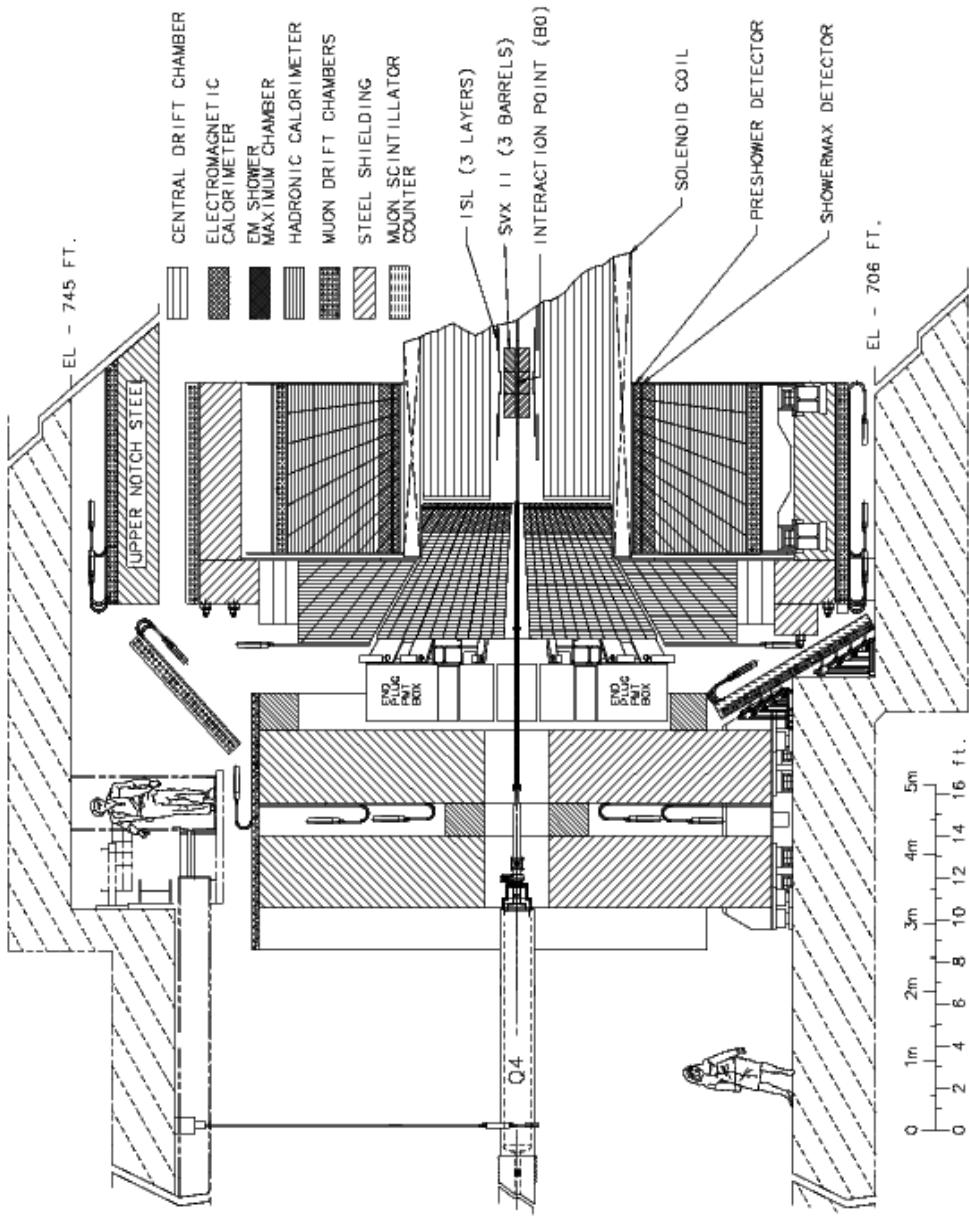
CDF Level 2 trigger upgrade, CLUSTER PULSAR board testing

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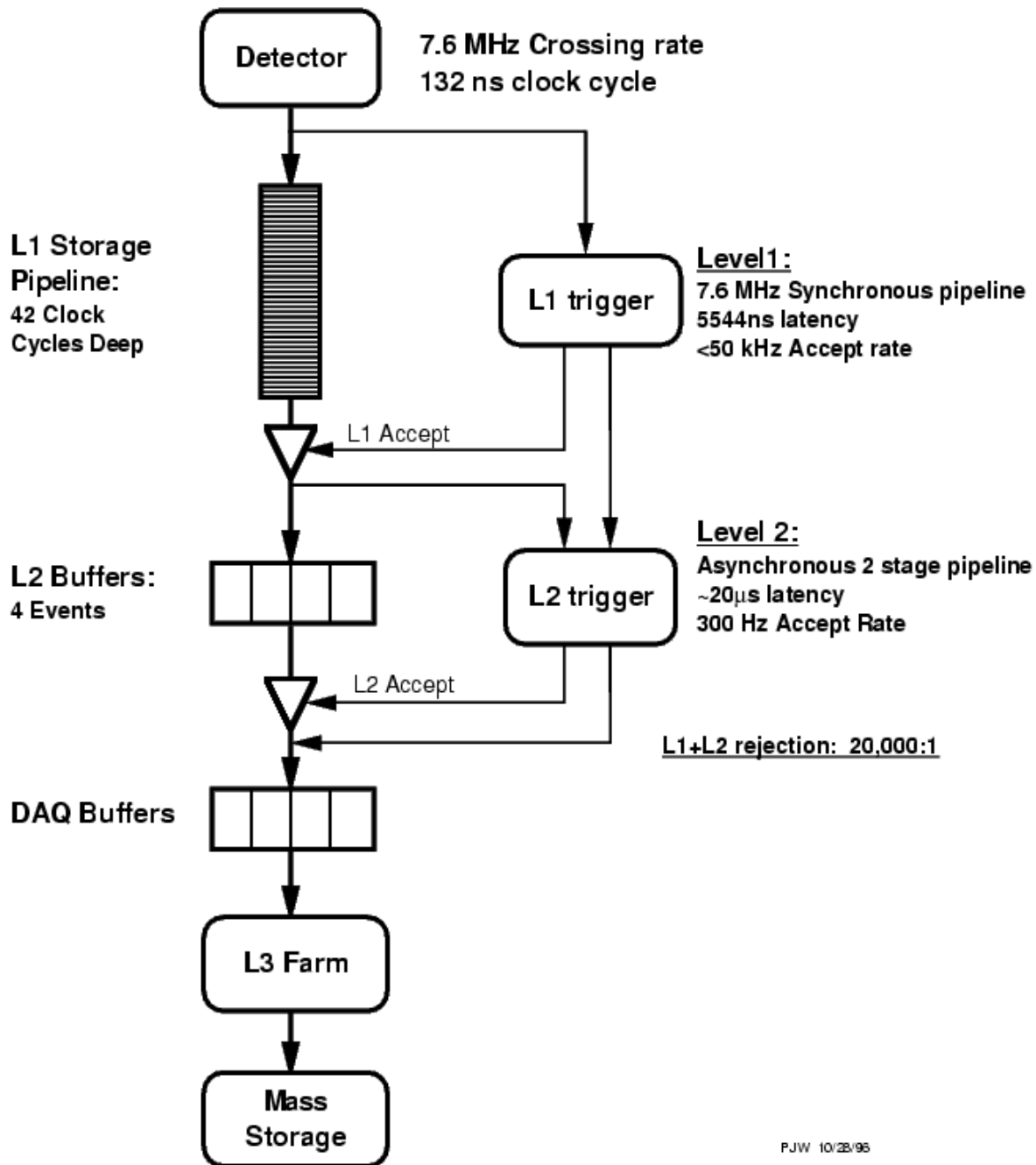
Physics 335

- Quick overview of the detector
- Description of the trigger
- Plans for the trigger upgrade and
CLUSTER PULSAR testing

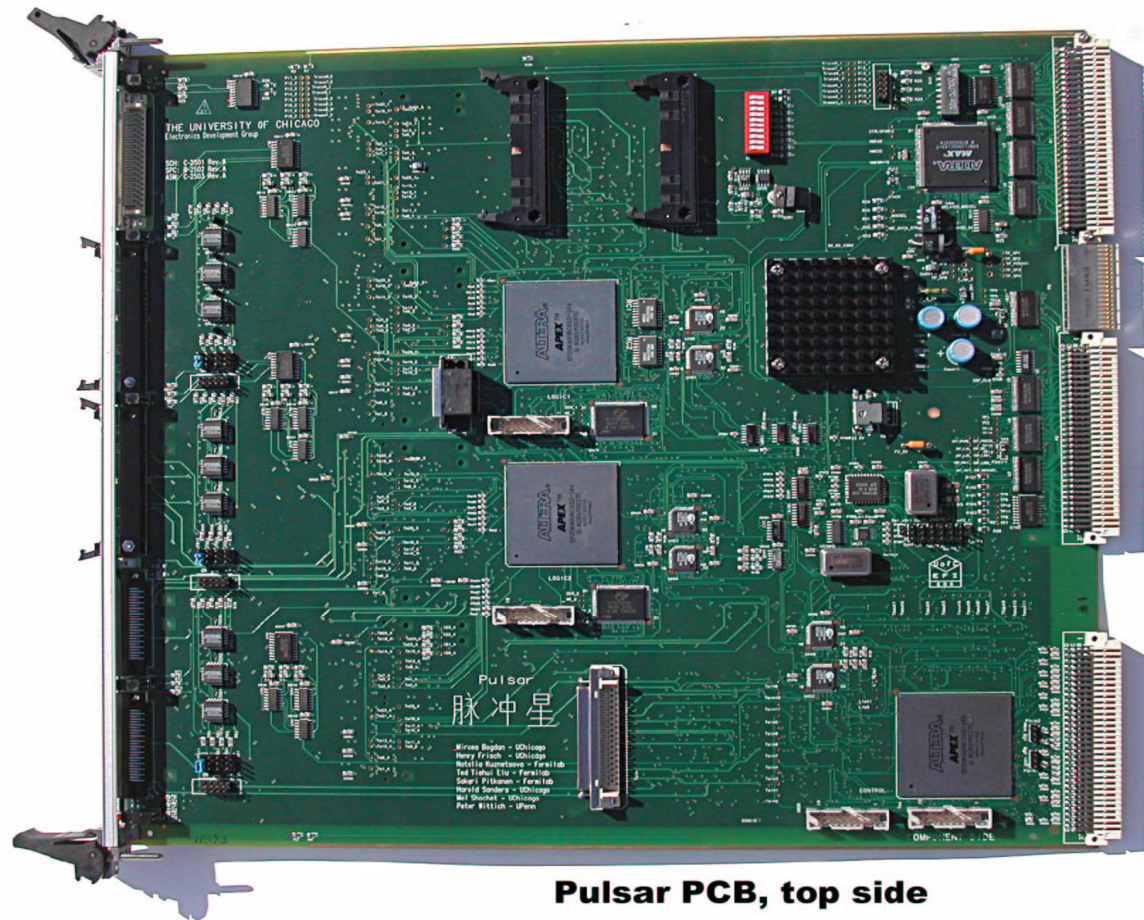


- Currently detector operates at 396ns bunch crossing with average number of collisions per crossing $\langle N \rangle \sim 2$
 - In run IIb the planned increase is $\langle N \rangle \sim 10$
 - Data is produced at much higher rate that can be possibly written out
 - Solution: Let's throw most of the data out and keep only the interesting events. We need a very good trigger.
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- Trigger is a 3-level system. Each level cuts down the data flow.
 - Successive layers perform more sophisticated processing
 - Criteria for storing events are based on presence of objects such as jets, b-tags, muons etc in the event.

Dataflow of CDF "Deadtimeless" Trigger and DAQ



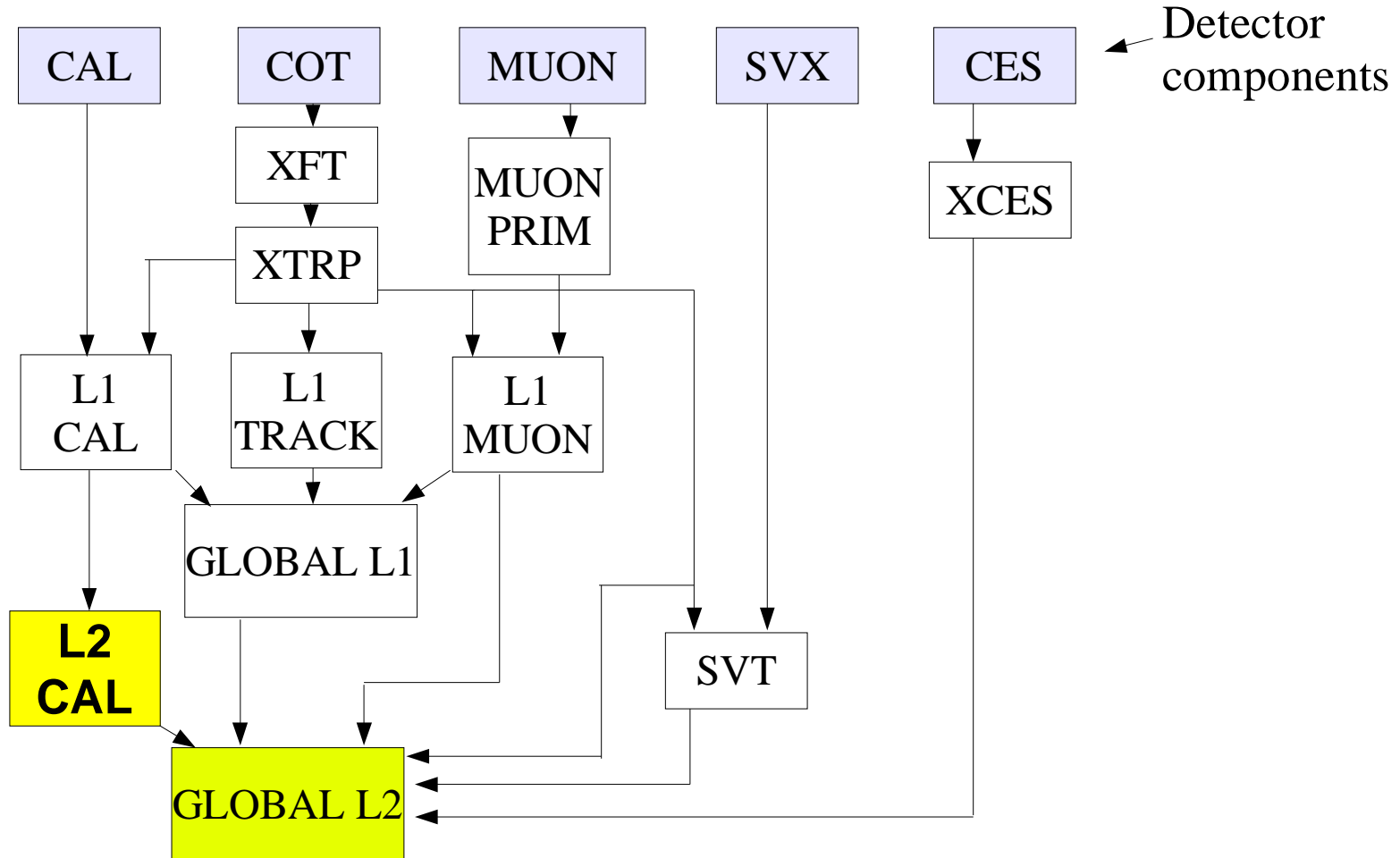
Level 2 upgrade is based on the PULSAR board



Pulsar PCB, top side

PULSAR board is a very flexible piece of hardware

- We are able to physically change the board by changing the firmware on the boards FPGAs
- All data formats can be processed- we have different 'mezzanine' cards for each format.



- CLUSTER and ISOCLUSTER PULSARS handle L2 calorimetry
 - Each board collects the calorimetry data i.e. clusters from upstream and after repackaging sends it downstream.
 - Some processing can be done by the PULSAR
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- PULSAR hardware is fully completed (recently CDF ordered 45 boards)
 - Firmware for the calorimetry nearly completed.

Major and non-trivial part is testing the L2 calorimetry boards:

- Tests will range from relatively simple such as writes/reads to registers to quite complicated
 - We will be able to check if the correct processing is performed at different stages inside the board
 - Perhaps some simulations of the processing will need to be done
 - Designing the test input will require some simulations as well: the board immediately upstream has no readout
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- Currently bringing back the teststand in the e-shop, so some simpler tests could be run on-site (among other uses)