

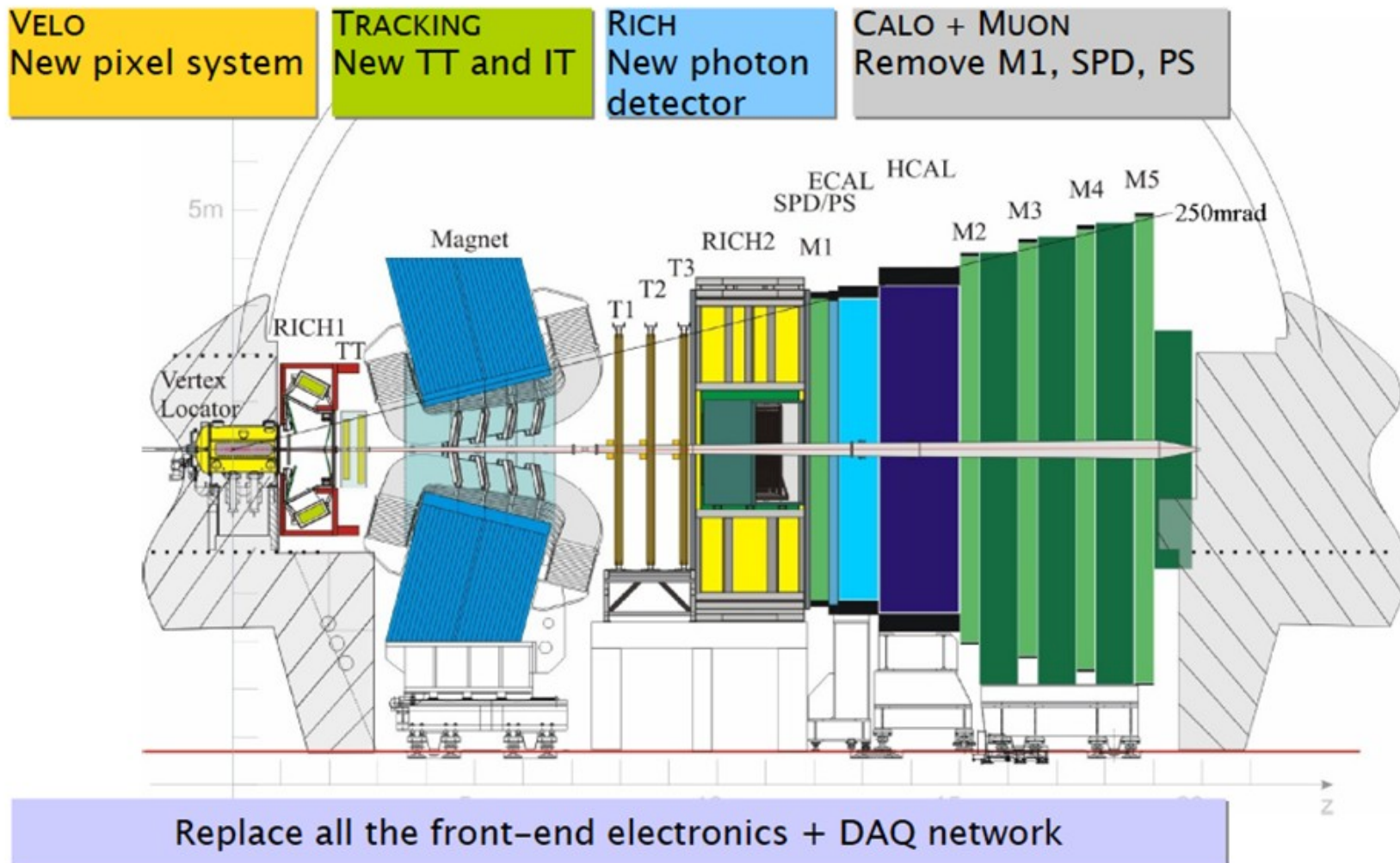
Elettronica per l'upgrade di LHCb

M.Morello per LHCb-Pisa

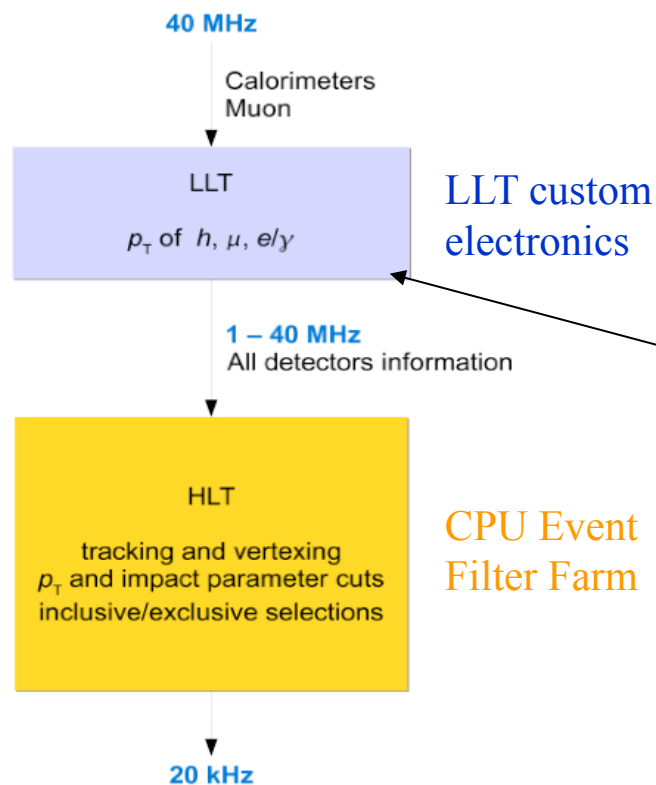
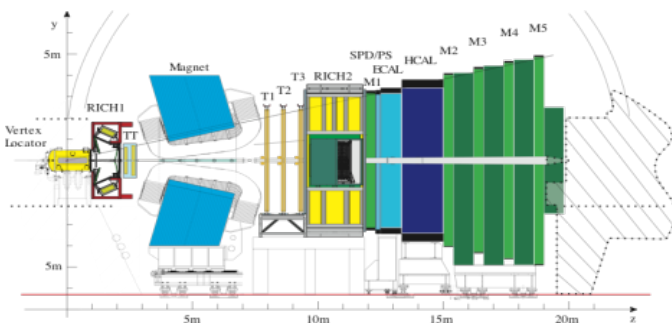
LHCb Upgrades for 2018

Detector modifications

55 MCHF project



DAQ Upgrade for 2018



- ✓ Software trigger with up to 40 MHz input rate and 20 kHz output rate
- ✓ Run at ~ 5 -10 times nominal LHCb luminosity $\rightarrow \mathcal{L} \sim 1\text{-}2 \cdot 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$
- Gain in signal efficiency (up to x7 for hadron modes)
- Upgrade electronics & DAQ architecture
- collect $\geq 5/\text{fb}$ per year and $\sim 50/\text{fb}$ in 10 years

***New proposal to INFN:
Level-0 track trigger***

- ✓ Strong motivation: ~ 5 -10 times increase in hadronic decay yields
- ✓ Challenging project: 40MHz event rate and low latency

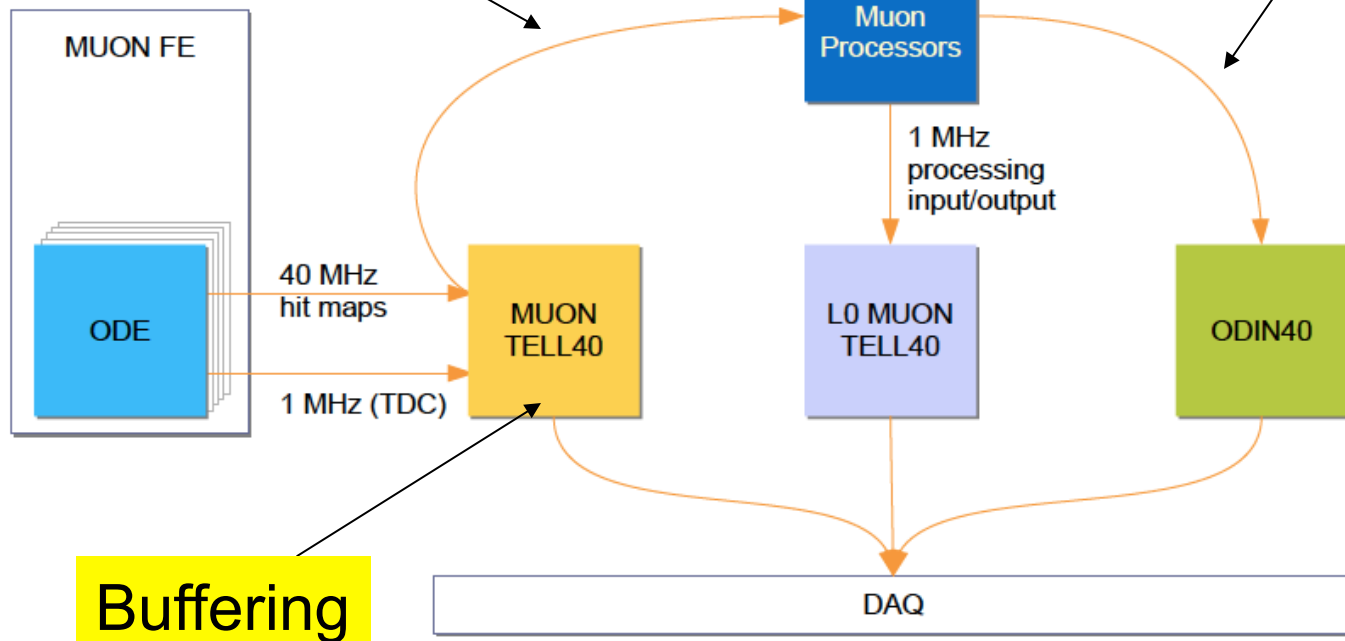
System Architecture

Low Level Muon flow

Proc Latency $< 2\mu\text{s}$

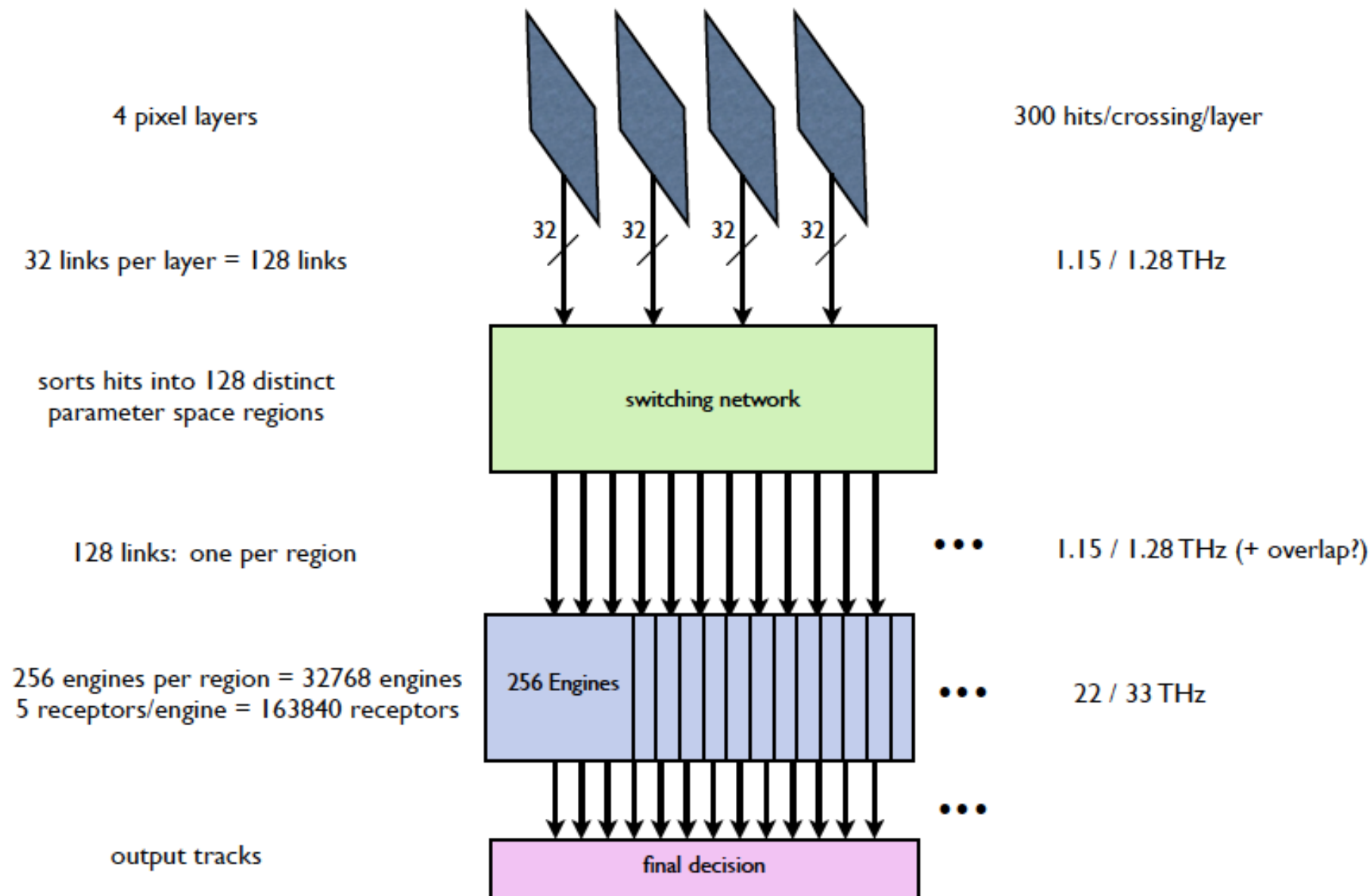
Total Loop delay $4\mu\text{s}$

Full data flow



ATCA-based, follow the same scheme of the existing L0-muon

Architecture



- ATCA-based
- Needs: System design, FPGA programming
- Currently in very early stage
- Starting in 2014/2015