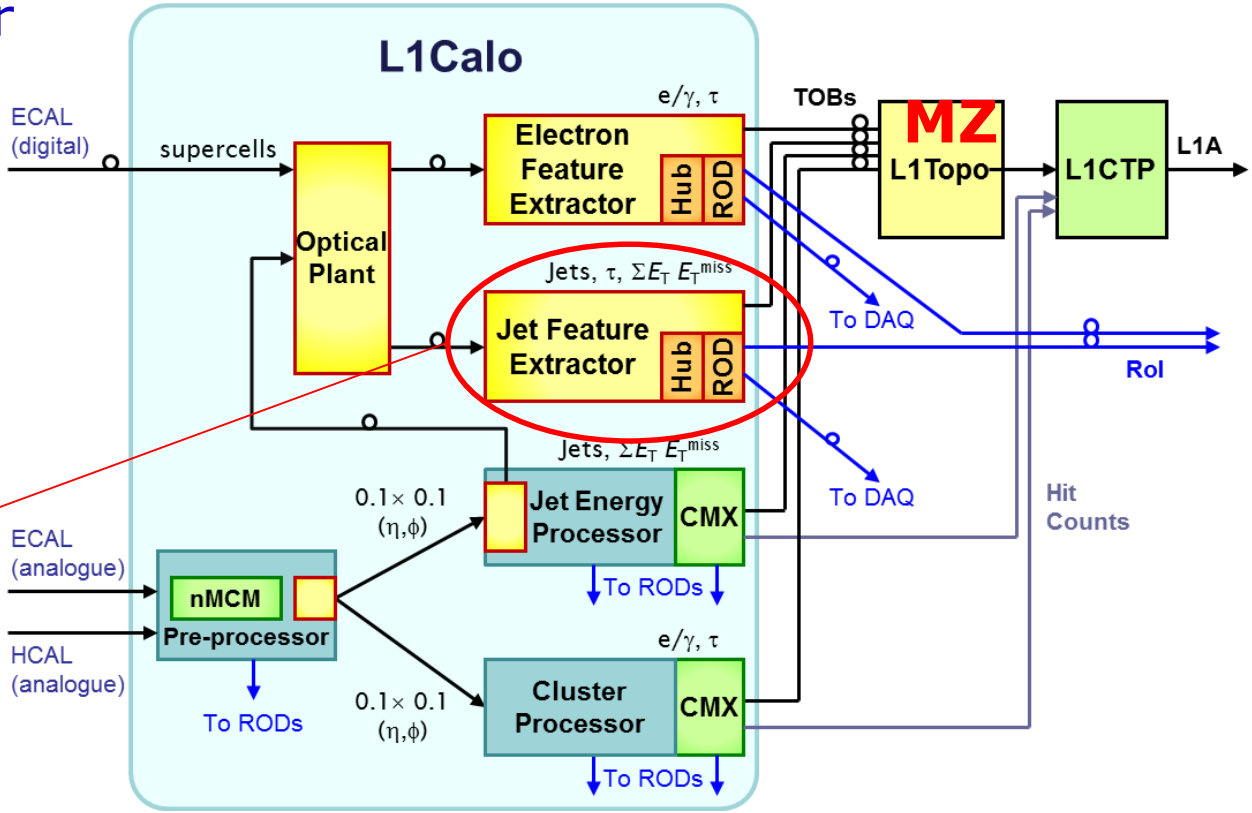
L1Calo @ ATLAS / LHC - phase 1

- 1st level calorimeter trigger (**jets**, e/m clusters, tau)
- jFEX / custom hardware, ~8 ATCA modules (blades)
- Opto fibre interconnect ~2.5 Tb/s per module
- FPGA based, low latency feature identification (real-time)
- Final trigger decision based on calorimetric and muon candidates at Central Trigger Processor

h/w development starting **now**

jFEX



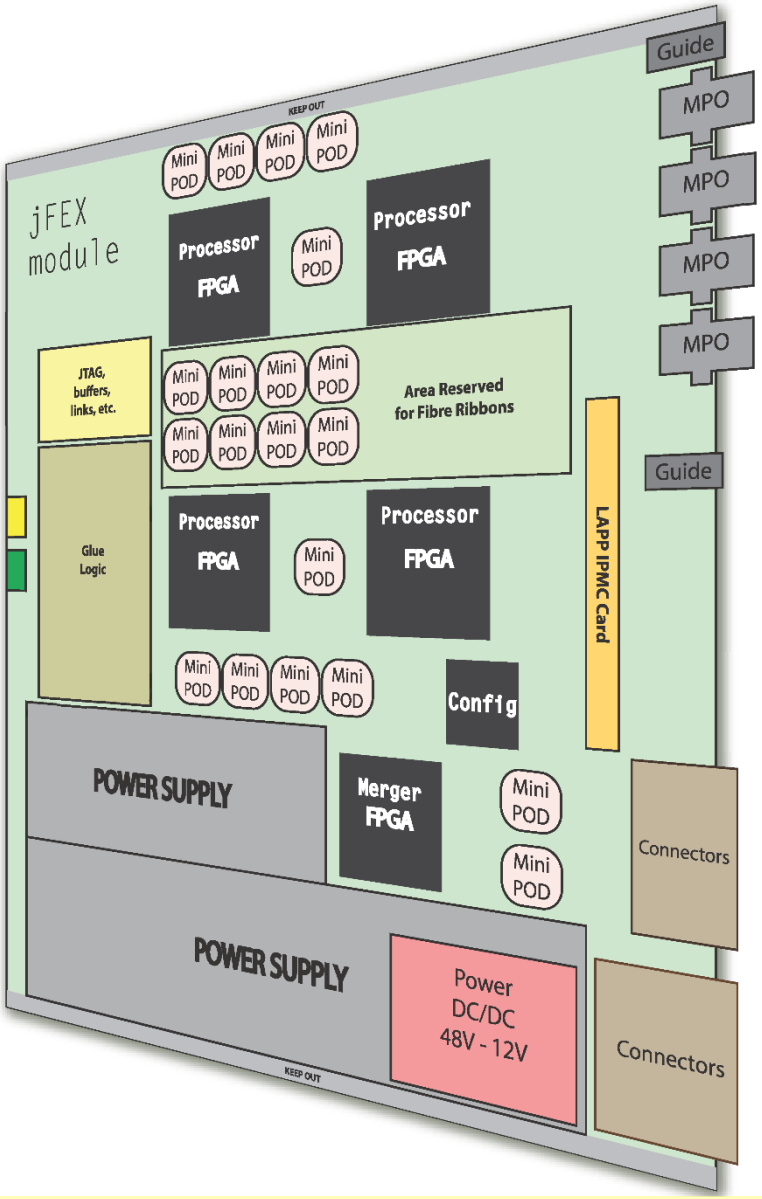
jFEX Prototype (mid 2015)

- ATCA (8U *280mm) blade
- Optical transmission from backplane to mPOD devices
- ~24 PCB layers
- ~500 high-speed links per blade
- 12.8 Gbit/s per link

Signal integrity at 12.8 Gb/s requiring proper PCB modelling:
PCB simulation with

Mentor Graphics HyperLynx
+ power modelling
+ thermal modelling
+…

Joint project with
PRISMA detector lab



Phase-2

- L1Calo re-baptised L0Calo (0-Level trigger)
- Add new 1st level trigger
- Higher latency budget (~30μs)
- Still near real-time
- Large switch box (event building, one full event per processor)
- Many processors fed with select event data
- Probably FPGA based / ATCA
- Start assessing technologies / surveying markets **now**