Off detector electronics

IIHE-ULB

Gilles De Lentdecker Yifan Yang Erik Verhagen

Current situation

GEM chamber segmentation

FE ASIC

Segments
(ie Segment A3)

1
2
3
.
.
.
.
.

Eta partitions

GBTs

A   B   C
Columns

Δφ=10°

GOL

? AMC13 (TBD)   @3.2 Gbps   AMC

µTCA Crate (12 slots)
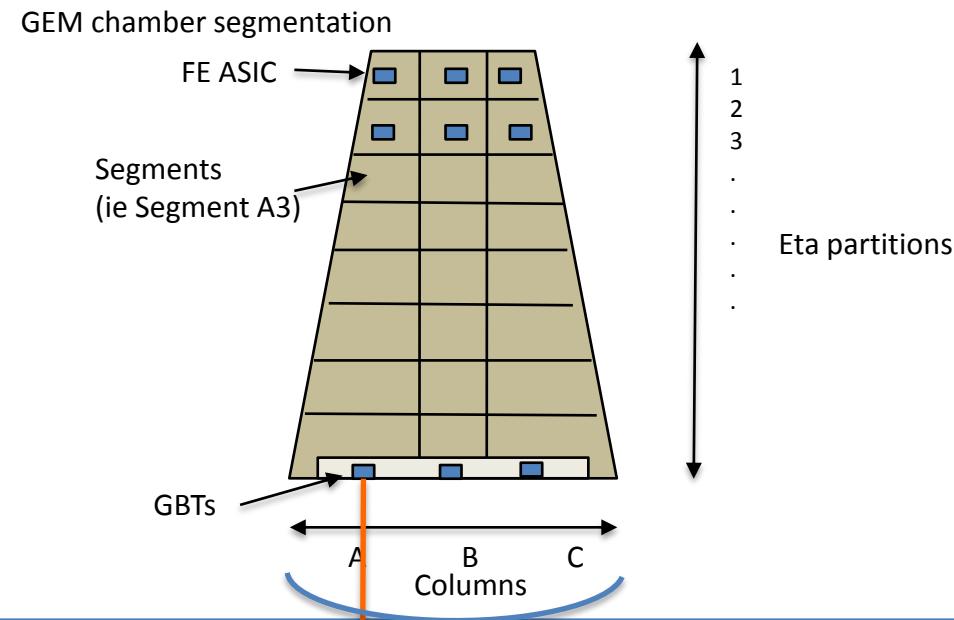
10°/3 ⟶ 2GBTs(Super chamber)

360° ⟶ 216GBTs

GE2/1+GE1/1 ⟶ 432GBTs

2 End cap ⟶ 864GBTs
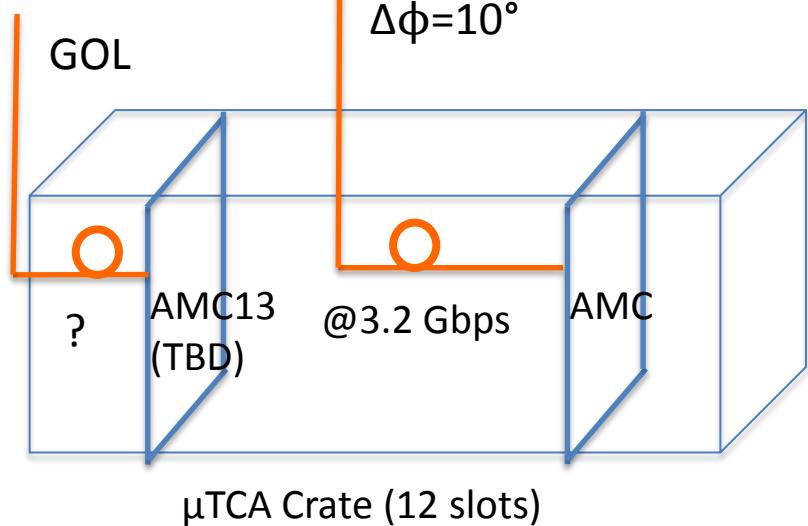
1 AMC ⟶ 8 GBTs

1 Crate ⟶ 9 AMCs

2 End cap ⟶ 108 AMC
⟶ 12 Crates

Input data of 1 crate = 3.2Gbps×8×9 = 230.4 Gbps

Bandwidth of backplane = 2Gbps×8 = 16 Gbps (PCIe Gen1)
or = 4Gbps×8 = 32 Gbps (PCIe Gen2)

Local data process is needed !

10°/3

10°

Use 10°/3 data from GE2/1
and 10° data from GE1/1
for first data selection

GE2/1
Reference plane

GE1/1

Offdet electronics

GE1/1

GE2/1
Reference
plane

Port 4-11
PCIe
(AMC to
AMC13)

Port 12-15
LVDS
(AMC to
neighbor
AMC)

AMC13

AMC

AMC

AMC
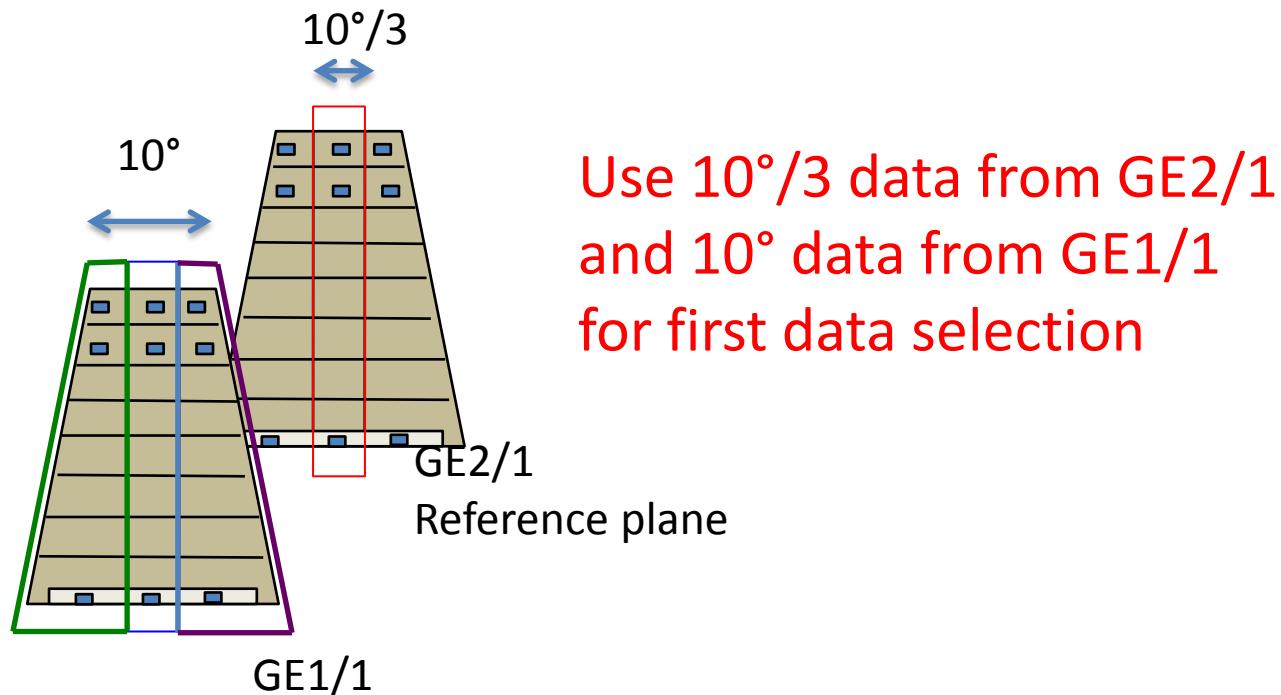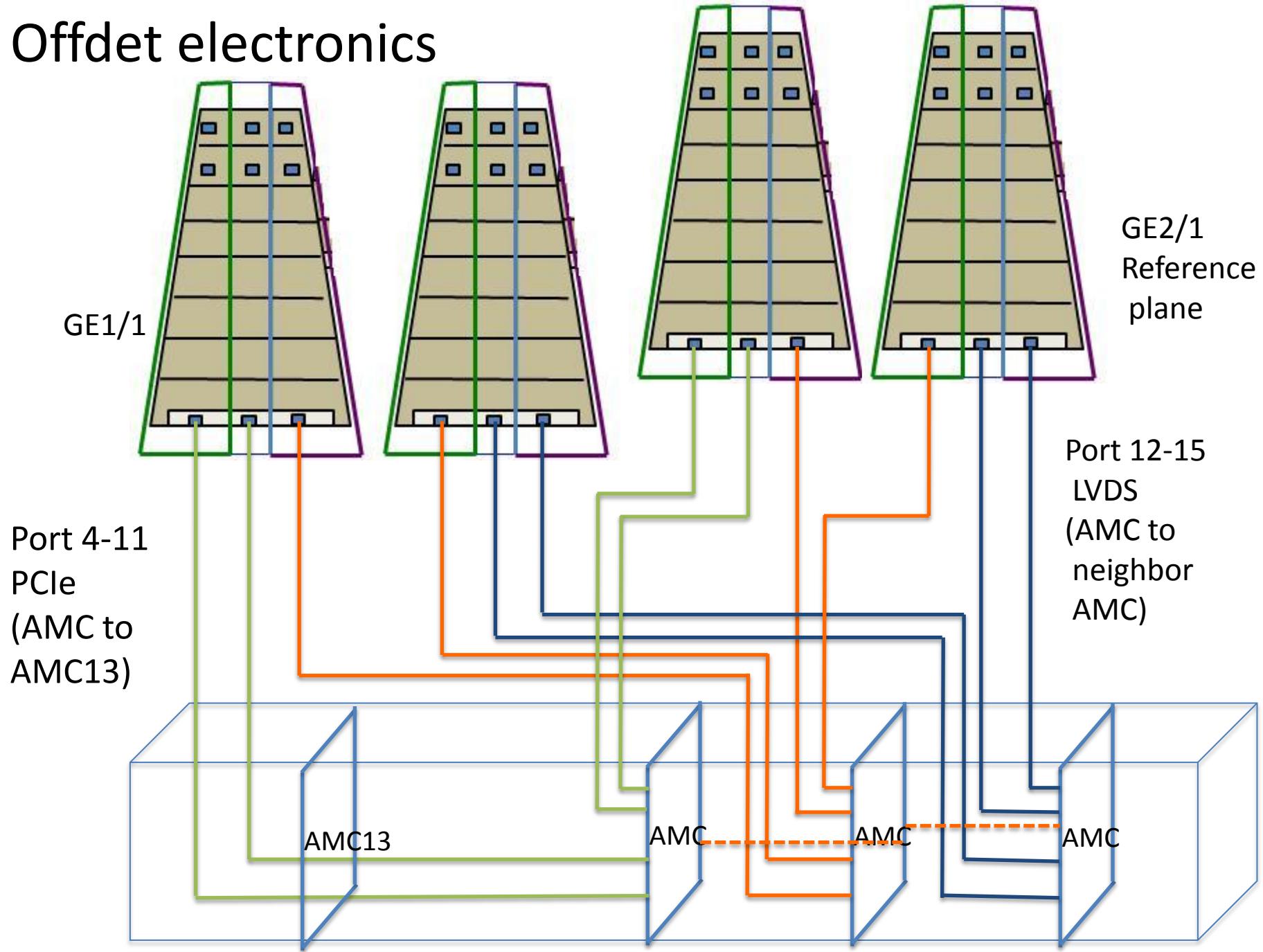
Possible way to decrease cost

XC6VLX130T-FF1156 20 GTX (6.5Gbps) ≥ 1000 $

XC6SLX150T-FG676 8 GTP (3.2Gbps) ≤ 250 $

+

GN4124 (PCIe Gen1 × 4) × 2 ≤ 70 $

Thank You!