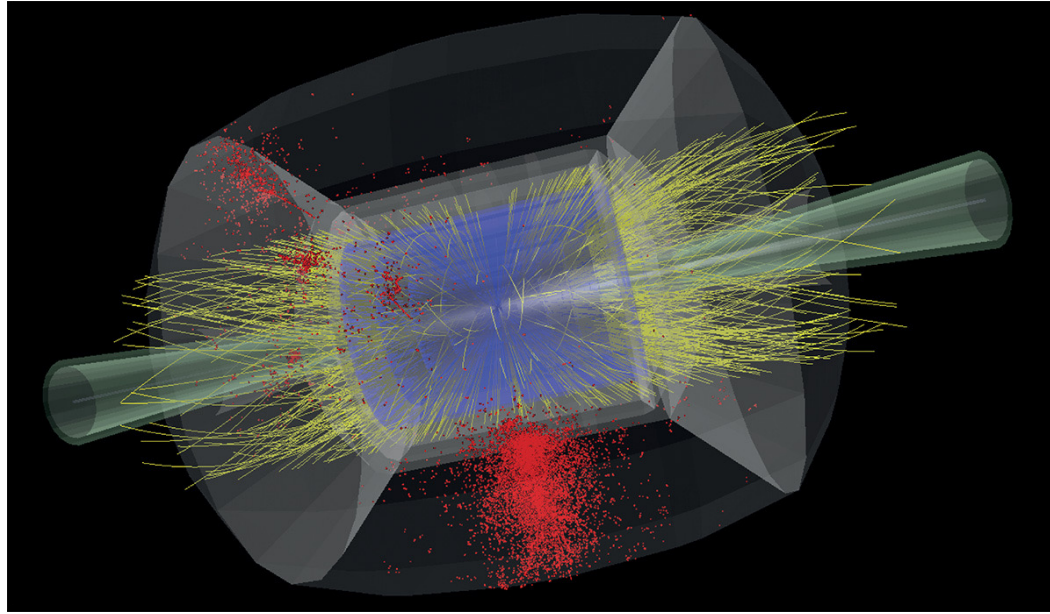




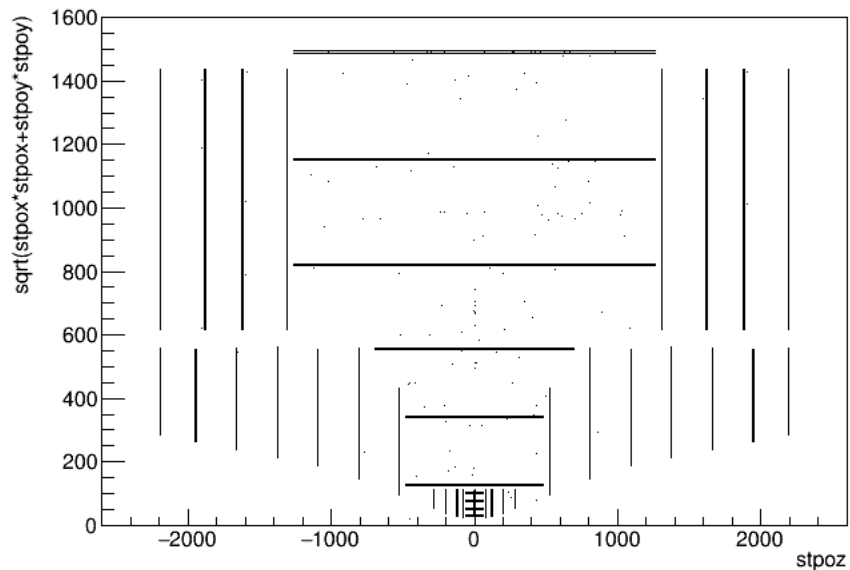
Occupancy comparisons at 1.5 and 10 TeV

Samples etc

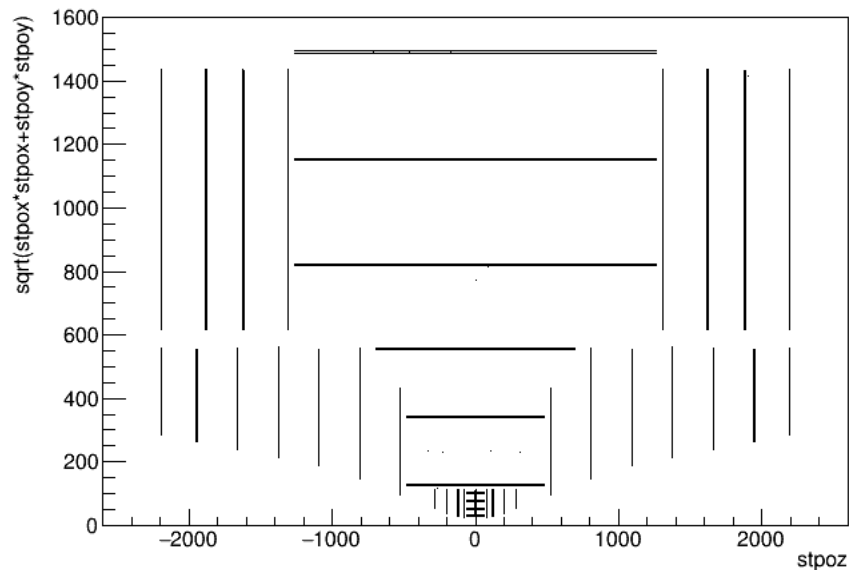
- Original presentation of tracker, occupancy, bandwidth requirements and power can be found in:
https://agenda.infn.it/event/34600/contributions/190714/attachments/101848/142031/MuC_OccupancyLLP_Feb2023.pdf
- Conclusion: can keep 15 ns online windows except VXD L1/2 (~ 1 ns)
- Comparing
 - Baseline 3 TeV detector with MARS 1.5 TeV BIB
 - v0A 10 TeV detector with FLUKA 10 TeV BIB
- Using simhits:
 - Lctuple with merged collection of VXD+IT+OT
 - Also split by μ^+ and μ^-
- Lctuple Files are in:
 - /data/sergo/10TeV_bib_v1

VXD – looks same as expected

1.5 TeV

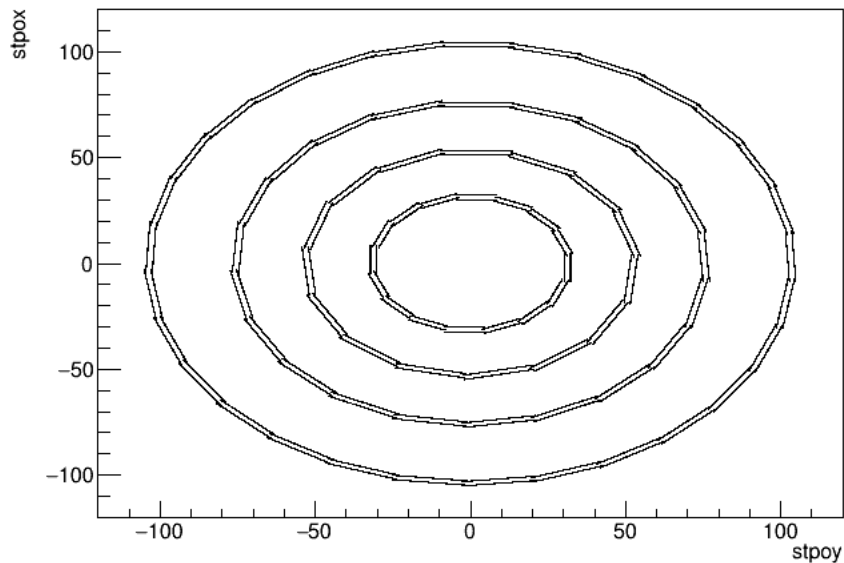


10 TeV

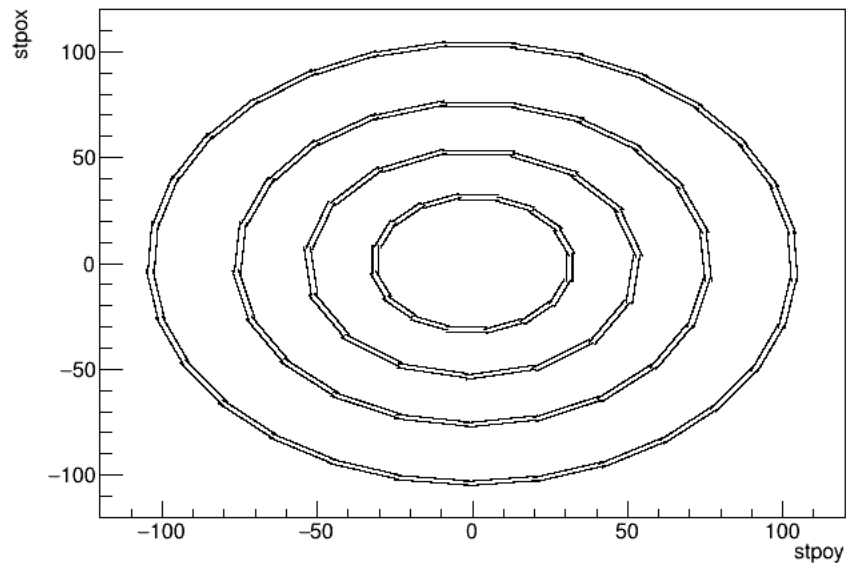


VXD – looks same as expected

1.5 TeV

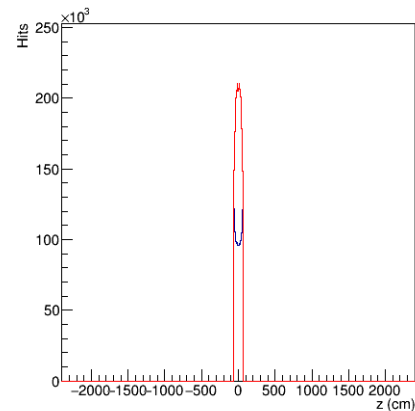
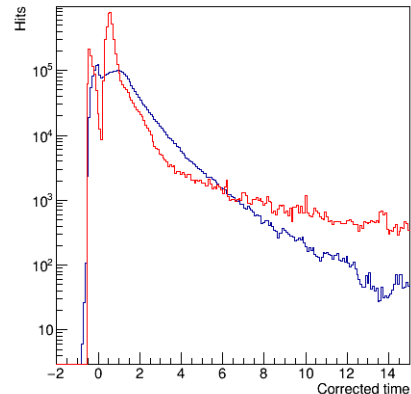
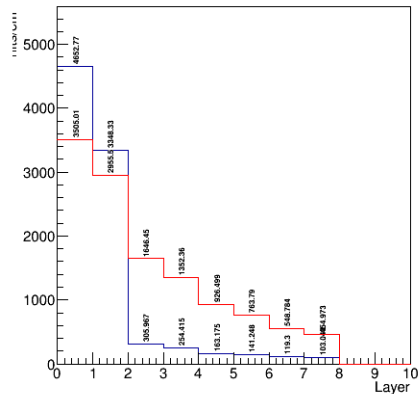
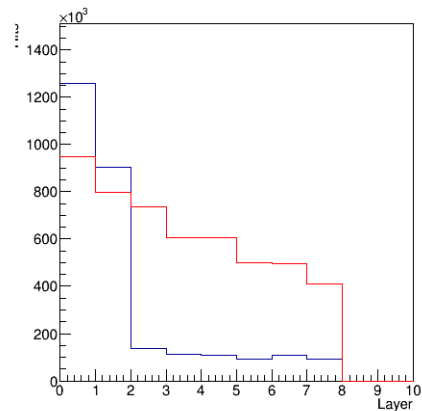


10 TeV

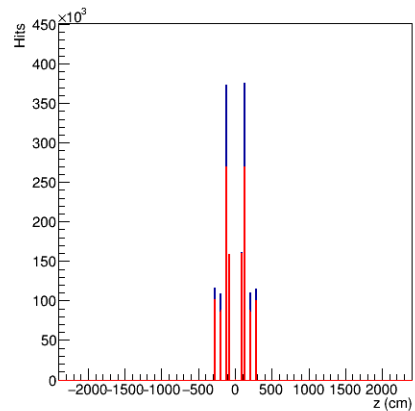
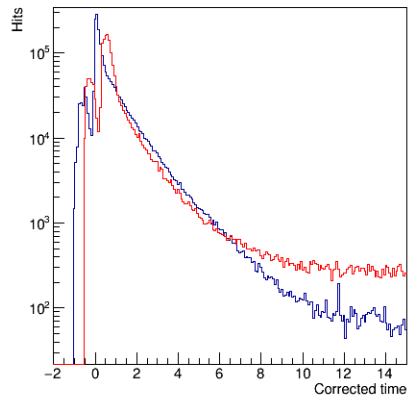
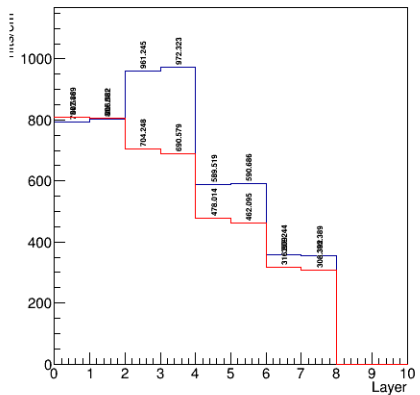
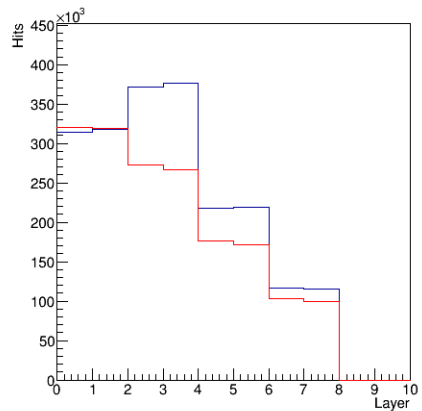


VXD: $t < 15$ ns (blue 1.5 TeV, red 10 TeV)

Barrel

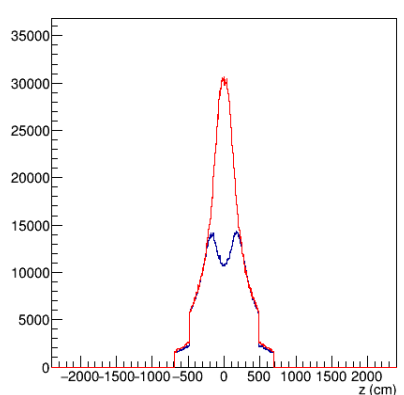
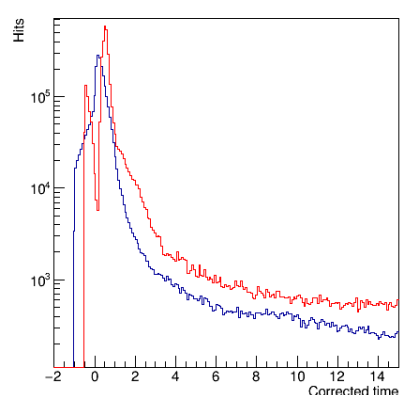
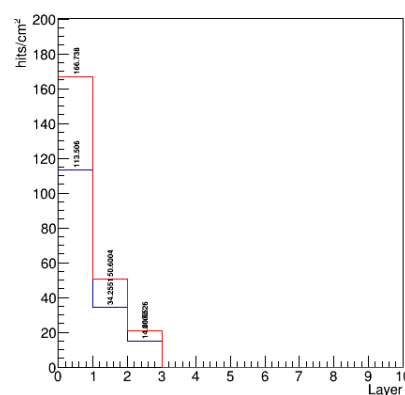
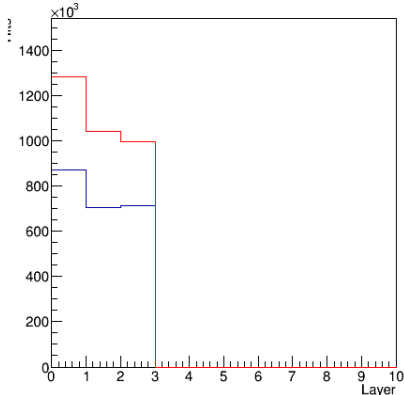


Disks

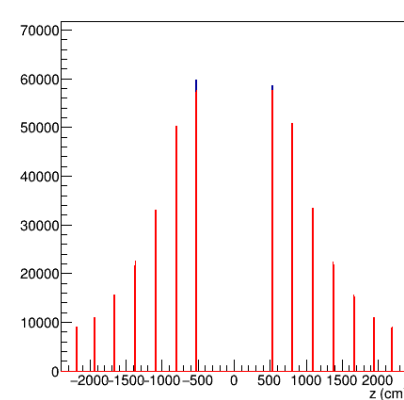
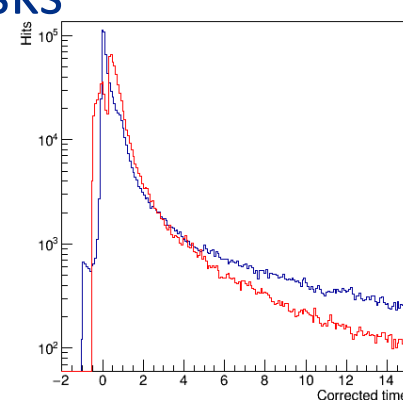
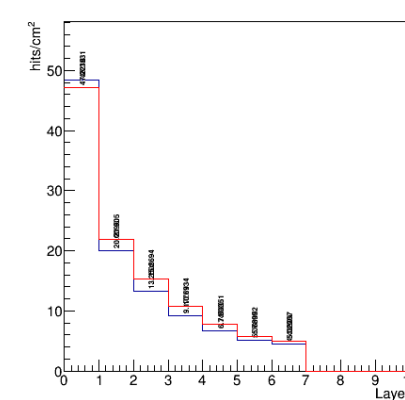
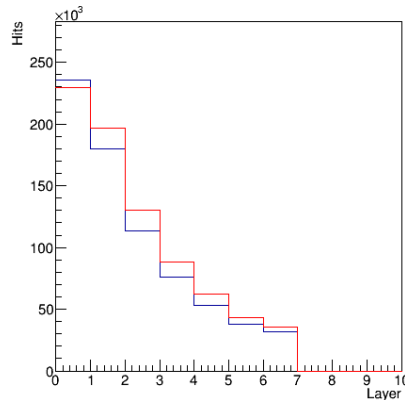


IT: $t < 15$ ns (blue 1.5 TeV, red 10 TeV)

Barrel

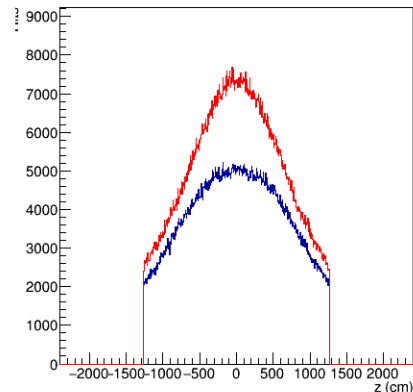
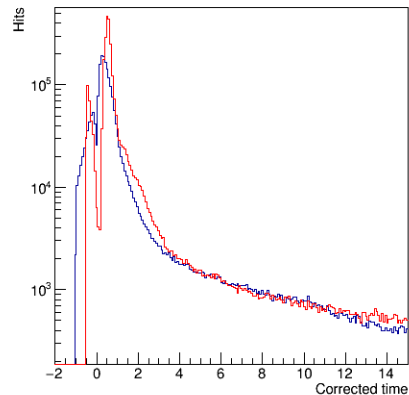
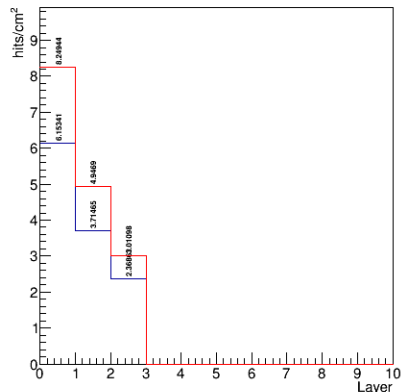
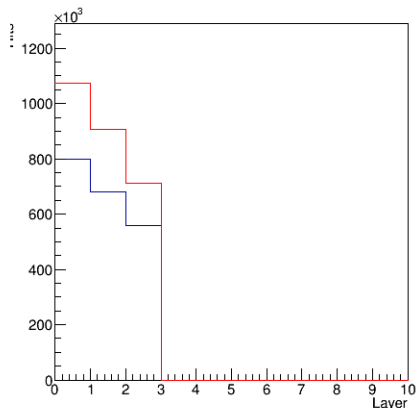


Disks

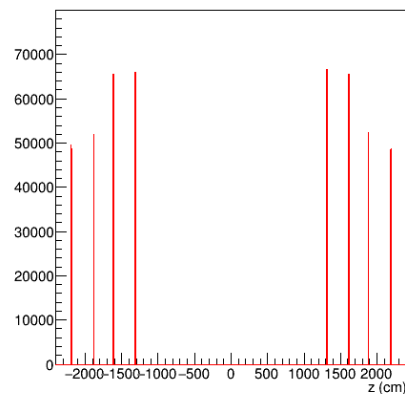
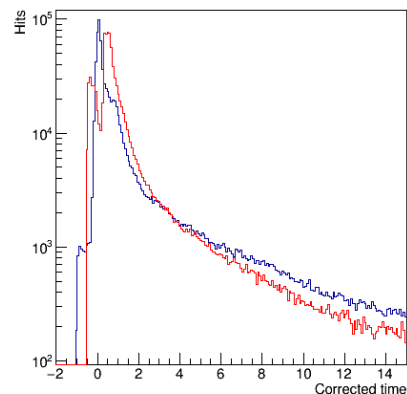
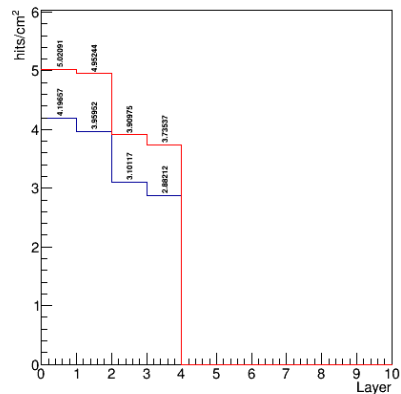
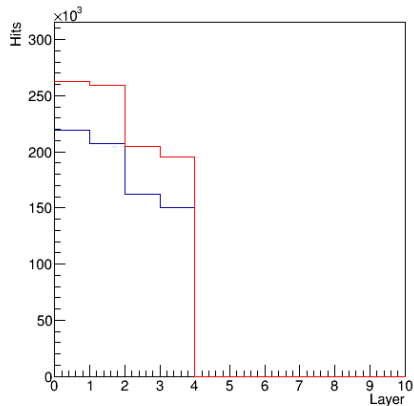


OT : $t < 15$ ns (blue 1.5 TeV, red 10 TeV)

Barrel



Disks



Convert into Data Rates and Power

	Upper timing cut (ns)	Module size (cm ²)	Maximum hits/cm ²	Reduction using cluster shapes	Data payload per module (Gbps)	Transmission power per module (W)	Total Transmission Power (W)
VXD barrel L1/L2	15	10	4600	x2	70	0.7	38
VXD barrel L1/L2	1	10	1600	x2	25	0.25	14
VXD barrel L3-8	15	10	1600	-	50	0.5	96
VXD disks	15	10	700	-	21	0.2	62
IT barrel	15	50	170	-	24	0.2	360
IT disks	15	50	60	-	9	0.09	96
OT barrel	15	100	10	-	3	0.03	165
OT disks	15	100	5	-	1.5	0.15	32

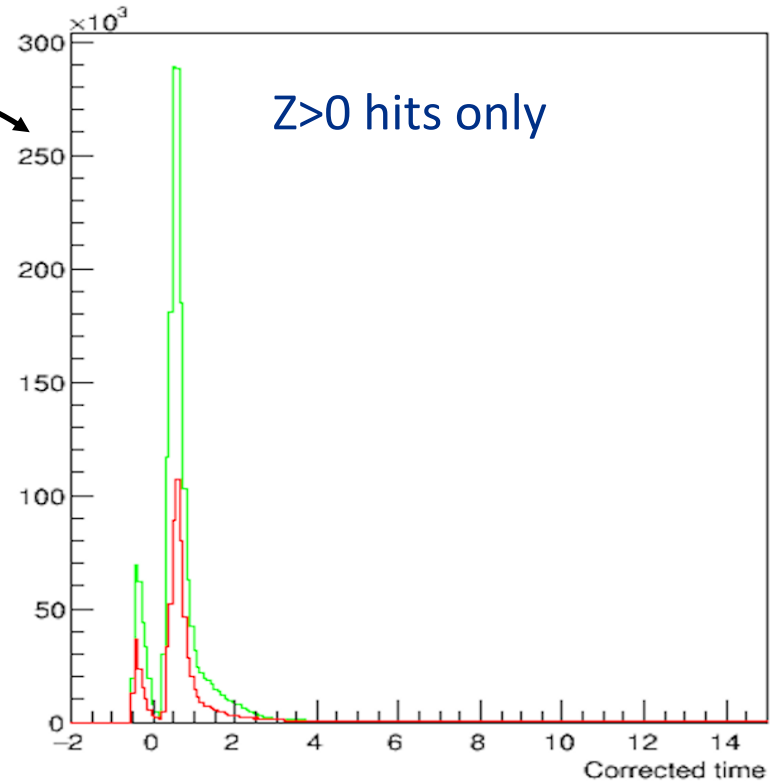
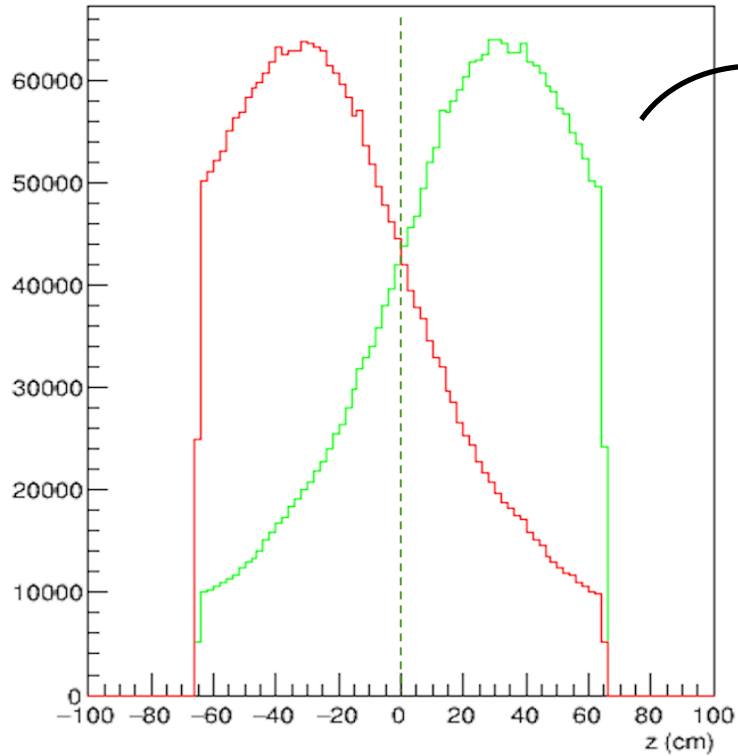
Options with VXD L3-8

	Upper timing cut (ns)	Module size (cm ²)	Maximum hits/cm ²	Reduction using cluster shapes	Data payload per module (Gbps)	Transmission power per module (W)	Total Transmission Power (W)
VXD barrel L1/L2	15	10	4600	x2	70	0.7	38
VXD barrel L1/L2	1	10	1600	x2	25	0.25	14
VXD barrel L3-8	15	10	1600	-	50	0.5	96
VXD barrel L3-8	15	10	1600	x2	25	0.25	48
VXD barrel L3-8	1	10	300	-	5	0.05	10

VXD Barrel

muminus

muplus



Summary
