

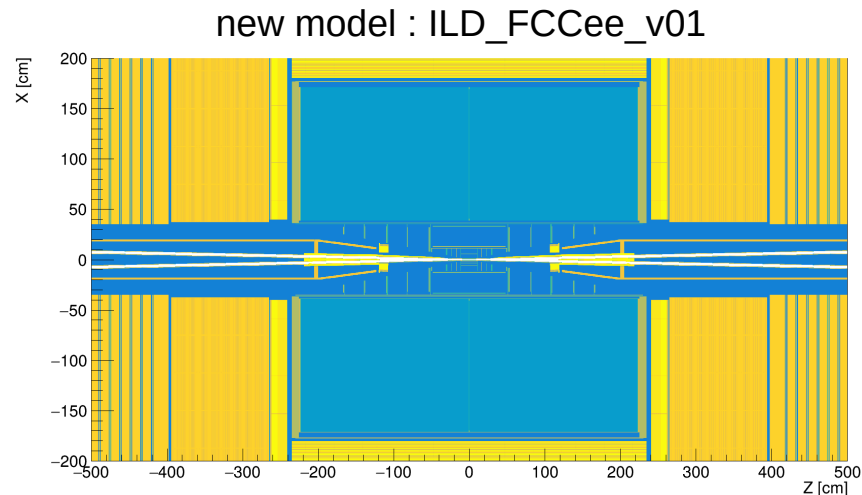
# Update on TPC backgrounds from beamstrahlung at FCCee

update with respect to my presentation at ILD meeting @ CERN in January  
<https://agenda.linearcollider.org/event/10211/contributions/53824/>

Daniel Jeans / KEK and Victor Schwan / DESY

previous results: primary ions produced in TPC

			FCC-91	FCC-240	ILC-250
bunch crossing frequency			30 MHz	800 kHz	6.6 kHz
model	B-field [T]	MDI	thousand ions / bunch crossing mean $\pm$ RMS		
ILD_15_v02	3.5 (uniform)	ILC	6.5 $\pm$ 19.9	14 $\pm$ 14	960 $\pm$ 150
ILD_15_v02_2T	2.0 (uniform)	ILC	6.9 $\pm$ 11.1	15 $\pm$ 11	4700 $\pm$ 300
ILD_15_v03	3.5 (map)	ILC	5.7 $\pm$ 7.9	14 $\pm$ 11	1100 $\pm$ 200
ILD_15_v05	3.5 (map, anti-DID)	ILC	0.6 $\pm$ 1.5	3.7 $\pm$ 9.7	450 $\pm$ 110
ILD_15_v11 $\beta$	2.0 (uniform)	FCC-ee	390 $\pm$ 120	1000 $\pm$ 170	110000 $\pm$ 2400
ILD_15_v11 $\gamma$	2.0 (map)	FCC-ee	270 $\pm$ 100	800 $\pm$ 140	100000 $\pm$ 1900
removing BeamCal's graphite layer					
ILD_15_v03	3.5 (map)	ILC			1300 $\pm$ 170
ILD_15_v05	3.5 (map, anti-DID)	ILC			590 $\pm$ 120

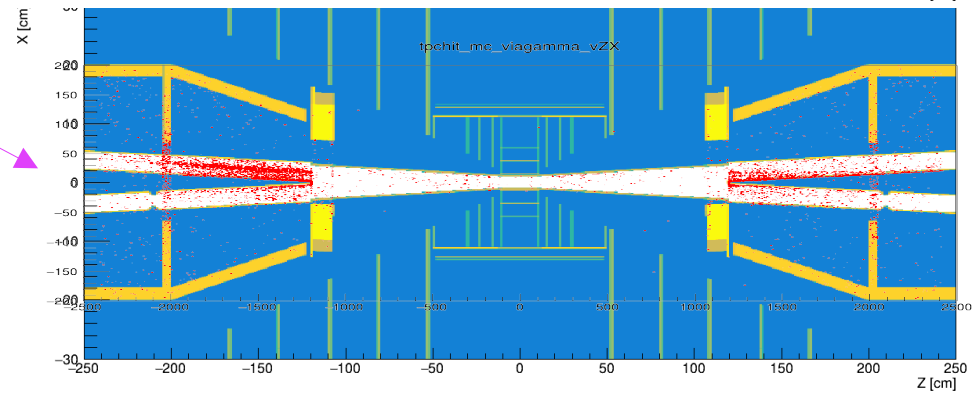
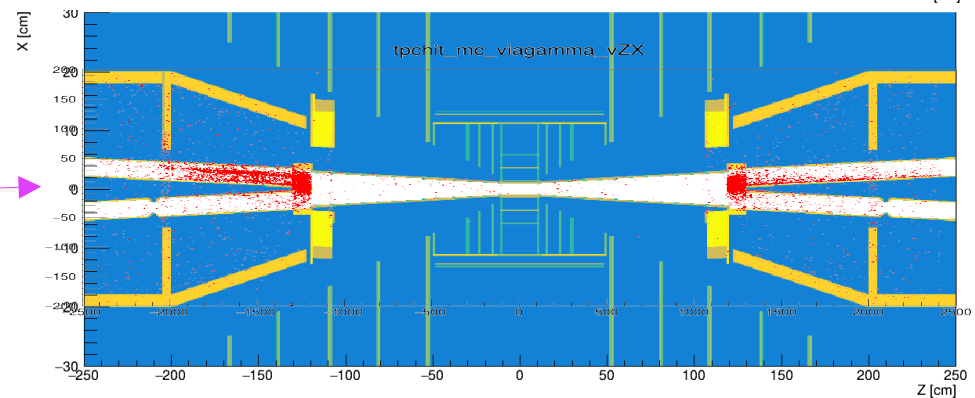
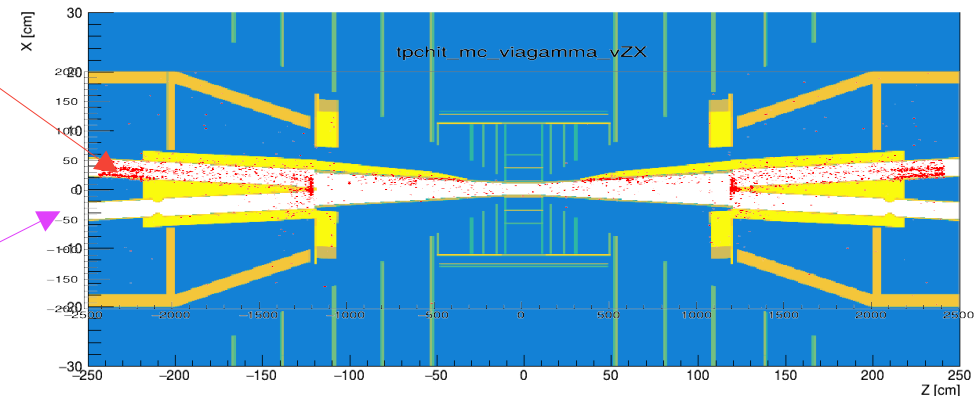


look at **first interaction**  
of initial MC particles  
which later induce TPC hits

default  
(with masks)

remove masks

remove masks and HOM

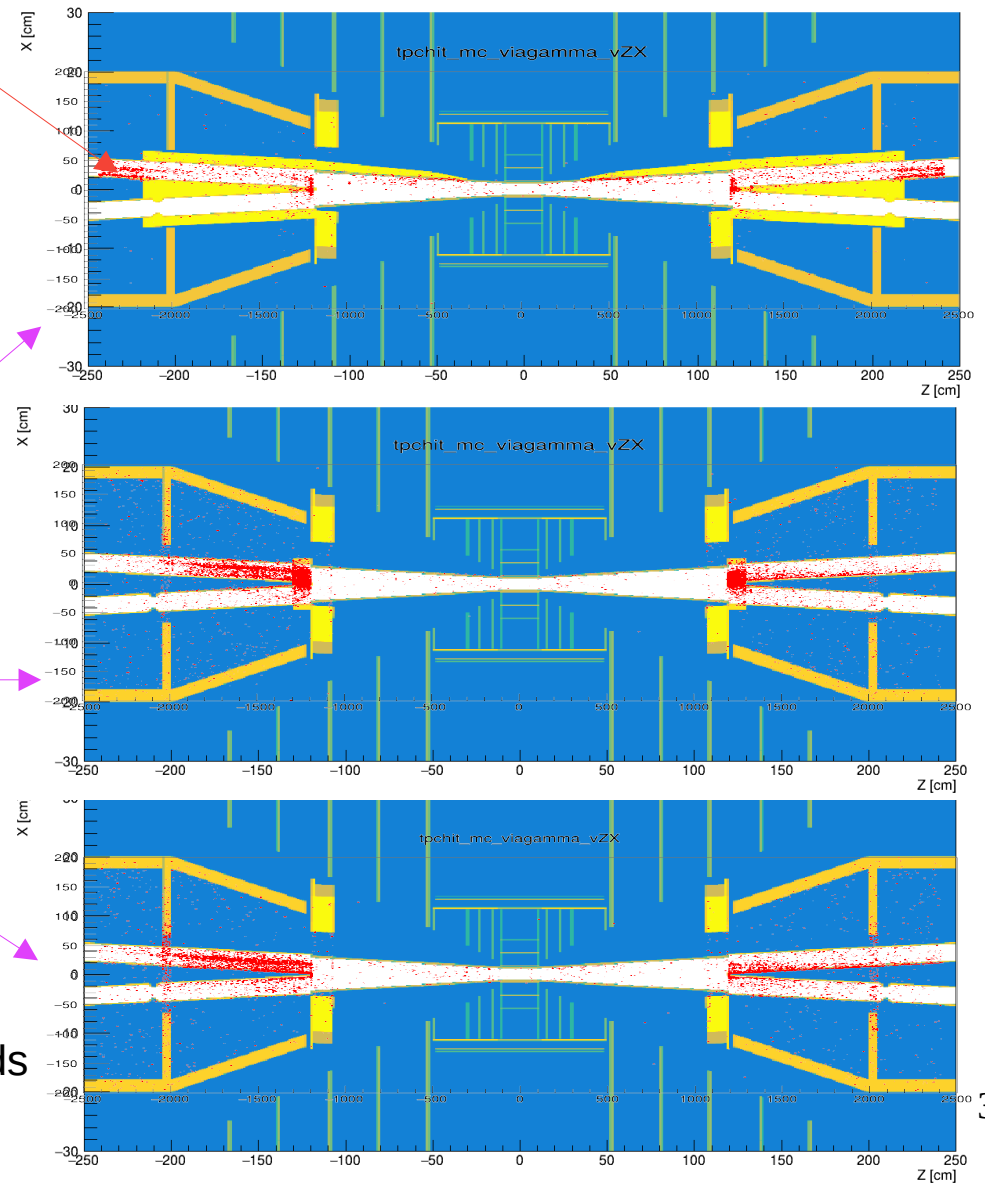


look at **first interaction**  
of initial MC particles  
which later induce TPC hits

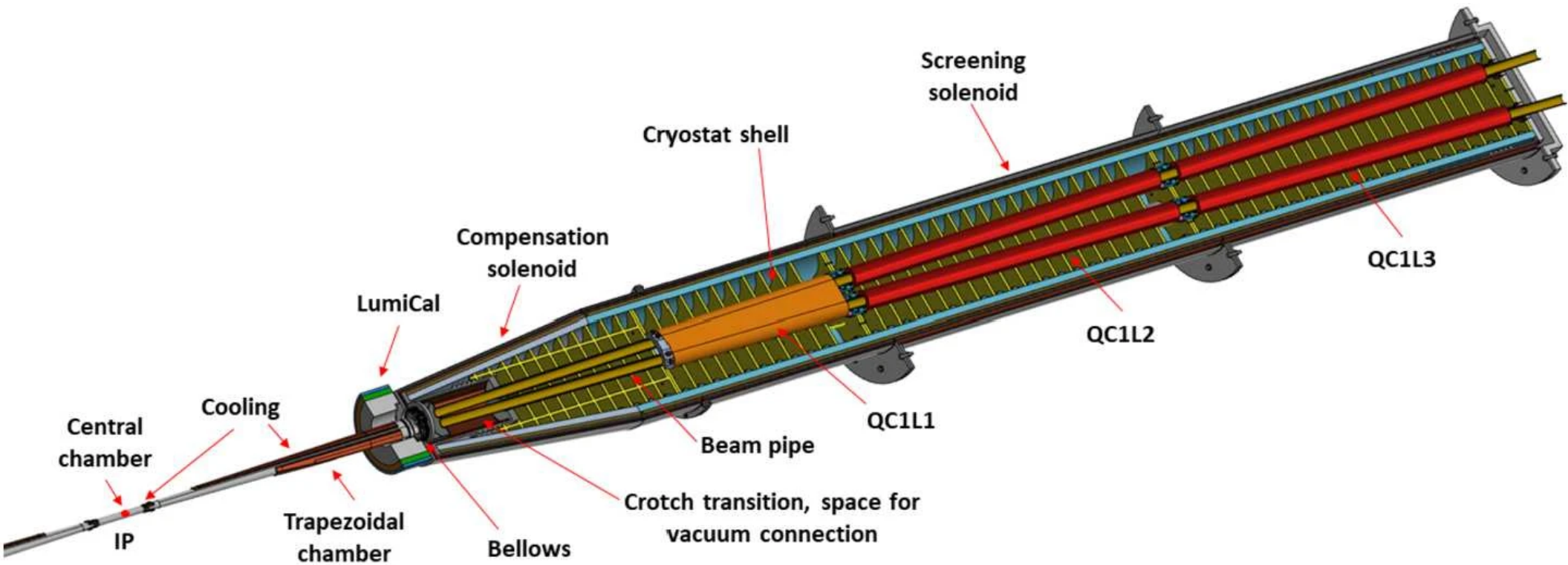
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			30 MHz	800 kHz	6.6 kHz
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ILD_15_v03	3.5 (map)	ILC			1300 $\pm$ 170
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new FCCee models					
ILD_FCCee_v01	2.0 (uniform)	FCC-ee	351 $\pm$ 115	987 $\pm$ 155	111000 $\pm$ 2100
ILD_FCCee_v01	2.0 (map)	FCC-ee	261 $\pm$ 86	823 $\pm$ 180	100000 $\pm$ 2100
ILD_FCCee_v01	2.0 (map), no mask	FCC-ee	707 $\pm$ 116	1586 $\pm$ 225	150000 $\pm$ 2200
ILD_FCCee_v01	2.0 (map), no mask HOM	FCC-ee	536 $\pm$ 114	1233 $\pm$ 170	

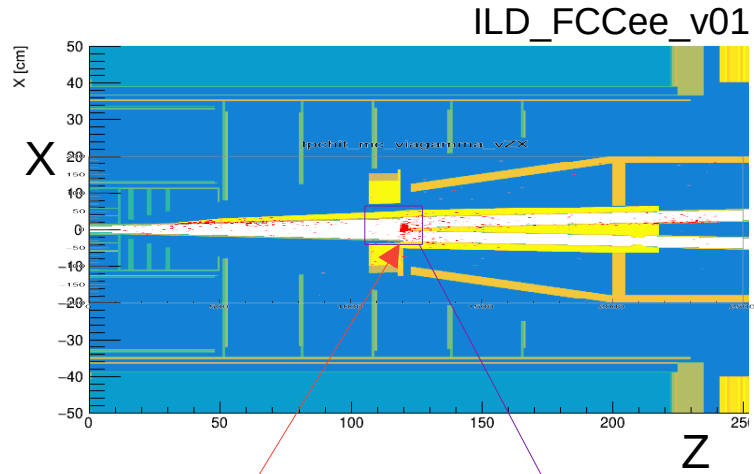
Table 2: Mean and RMS of the number of primary ions produced by beamstrahlung background in the TPC per bunch crossing in various collider and detector configurations.

- many TPC hits induced by beamstrahlung interactions with shielding
- if we remove the shielding, they just interact elsewhere: actually *increases* TPC backgrounds
- z-symmetry... ?

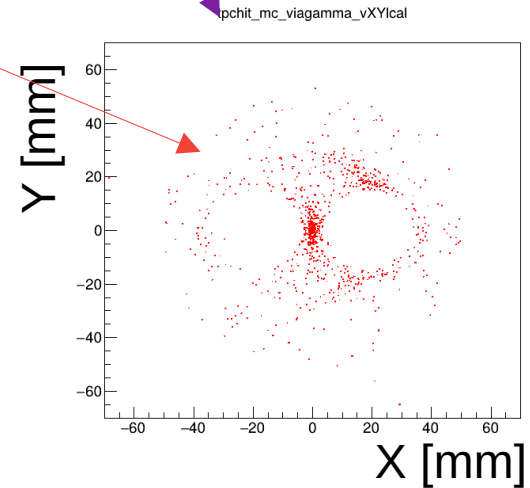


backup





first interaction of initial MC particles which later induce TPC hits



“crotch” region