

Svt Background: Feb 2010 production



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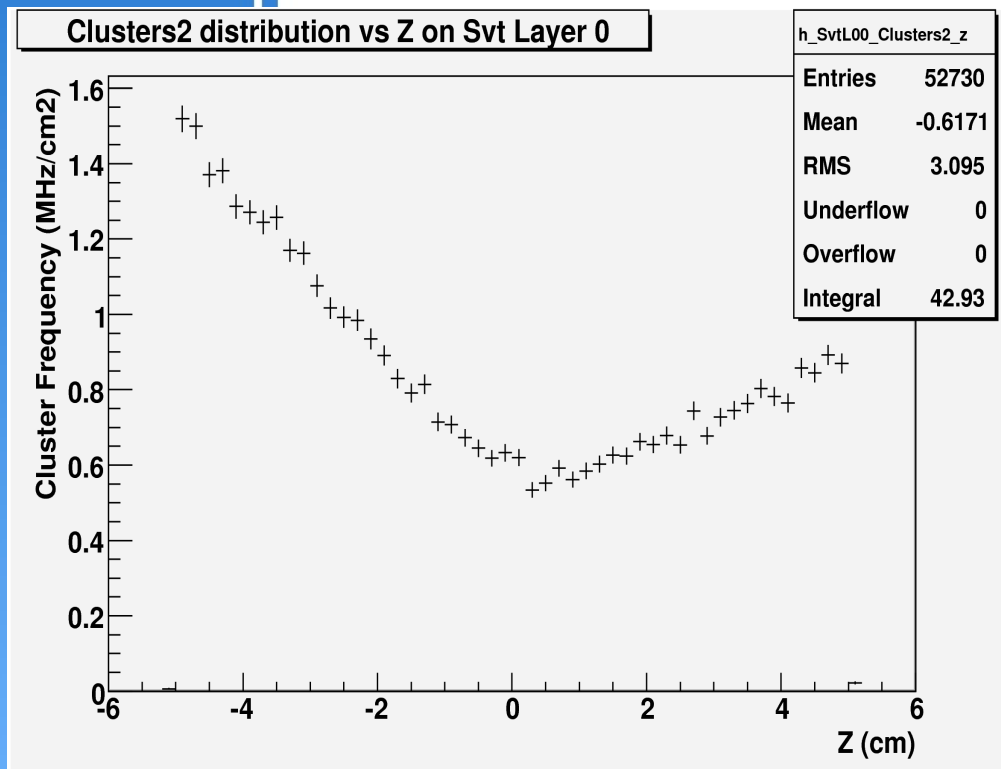
Production configurations

- Modified geometry from previous studies:
 - Dirc and Bwd Emc added
 - Different shielding
 - Minor change: 3um of gold coating inside BP instead of 10um
- 5 simulated configurations for RadBhabha:
 - Default (DeltaE 10%), 200k evts
 - Unshielded, 200k evts
 - Lower DeltaE: 1%, 200k evts
 - Lower DeltaE: 0.2%, 200k evts
 - High precision neutron tracking, 100k evts

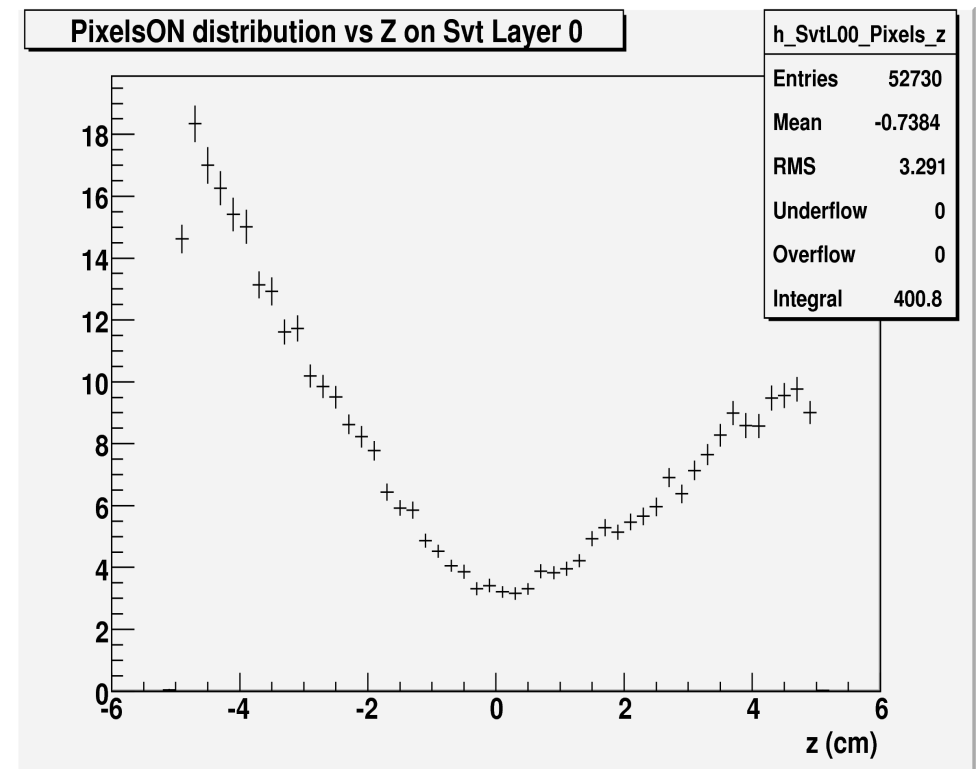
Cluster/Pixel rates distribution: z

- Radiative Bhabha is not the main bkg for Svt
- Z distribution confirms that most part of the hits is not from tracks directly from IP

L0 Cluster Freq



L0 Pixel Freq



Cluster rate again

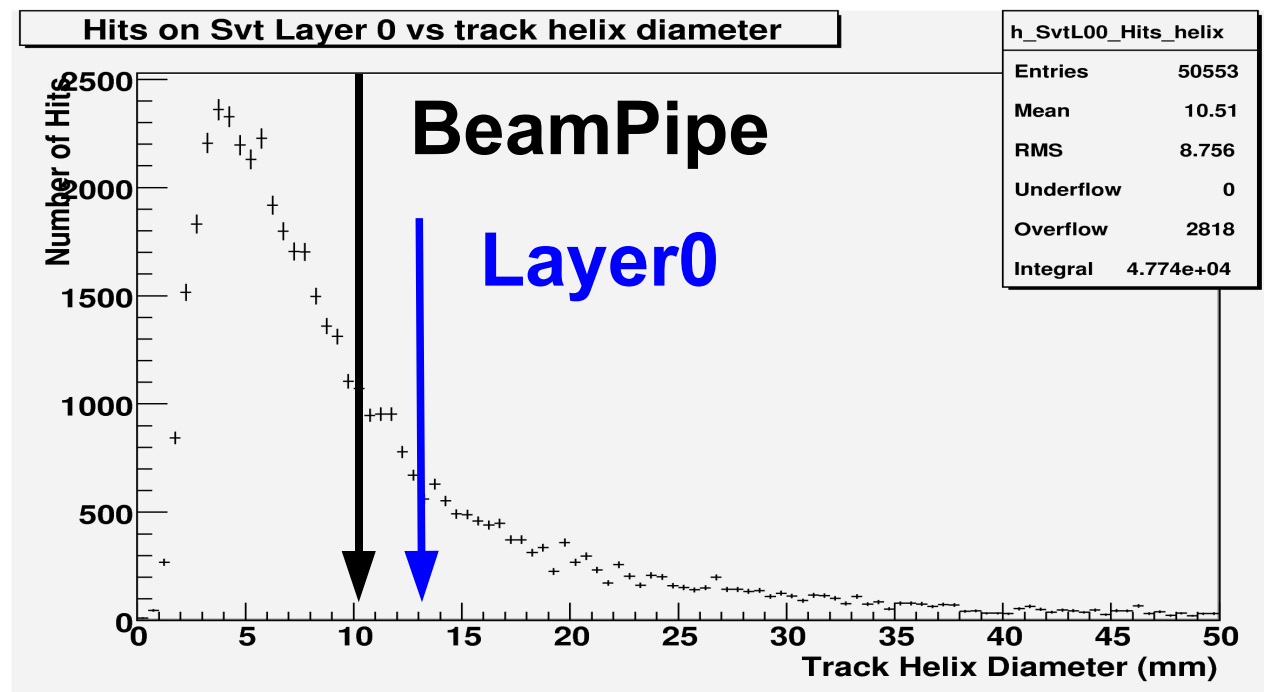
- Overall rates are not significantly different from previous results
- No significant difference even between different simulation configurations, less than 5%

SVT Layer	Cluster rate (kHz/cm ²)	Pixel rate (kHz/cm ²)
Layer 0	858	8016
Layer 1	62	116
Layer 2	38	71
Layer 3	15	28
Layer 4	3.4	5.4
Layer 5	2.1	3.4

- Pixel rates on layer 1-5 are ok, rate on layer 0 is still high but...

Cluster rate

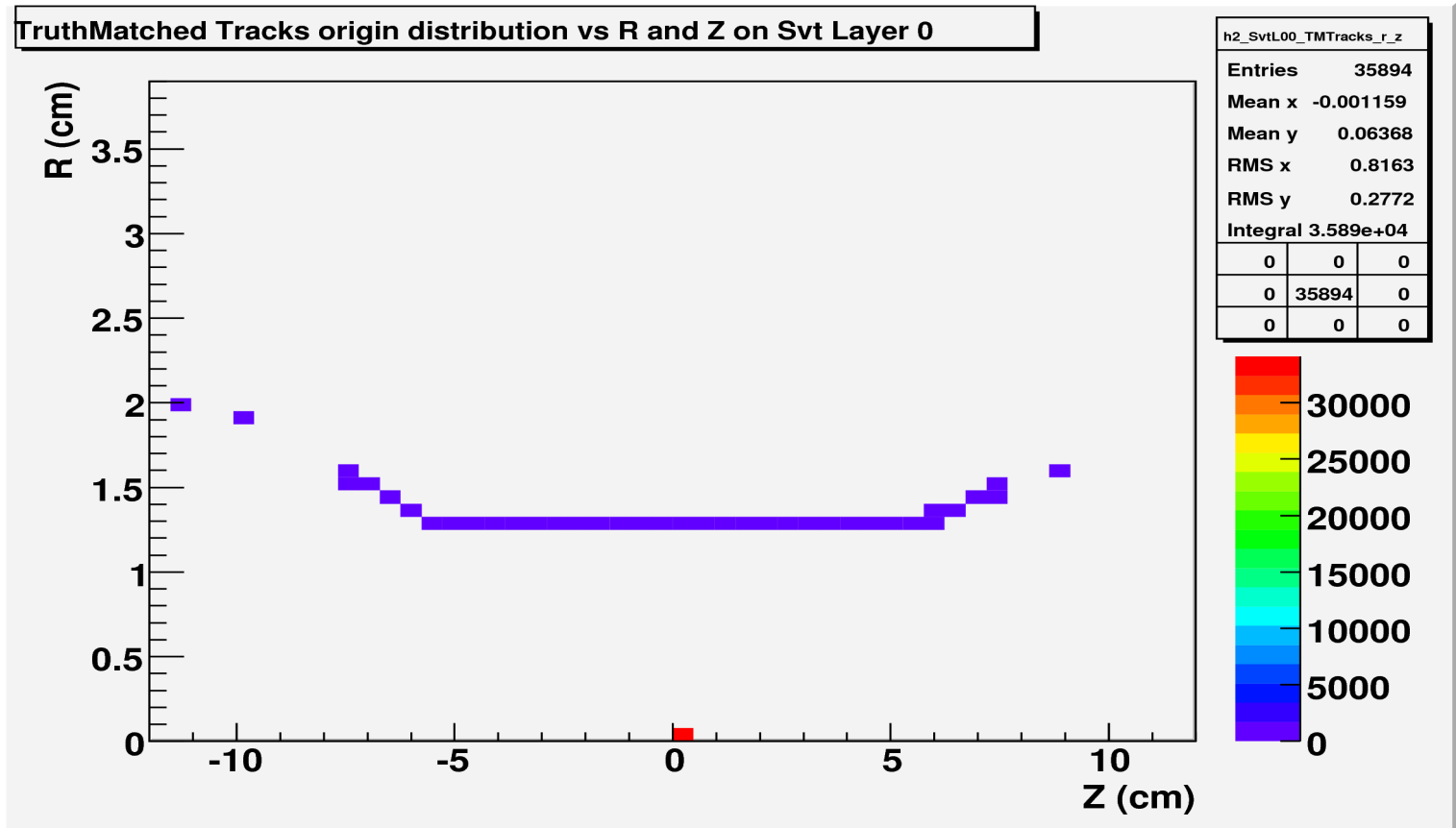
- Anyway the rate is too high comparing to Eugenio estimation
- Helix diameter for tracks that generates hits in L0



- Magnetic field is disabled at IP and sometimes the photon is so energetic that beam electron has few MeV mom, not negligible tail. To be fixed...

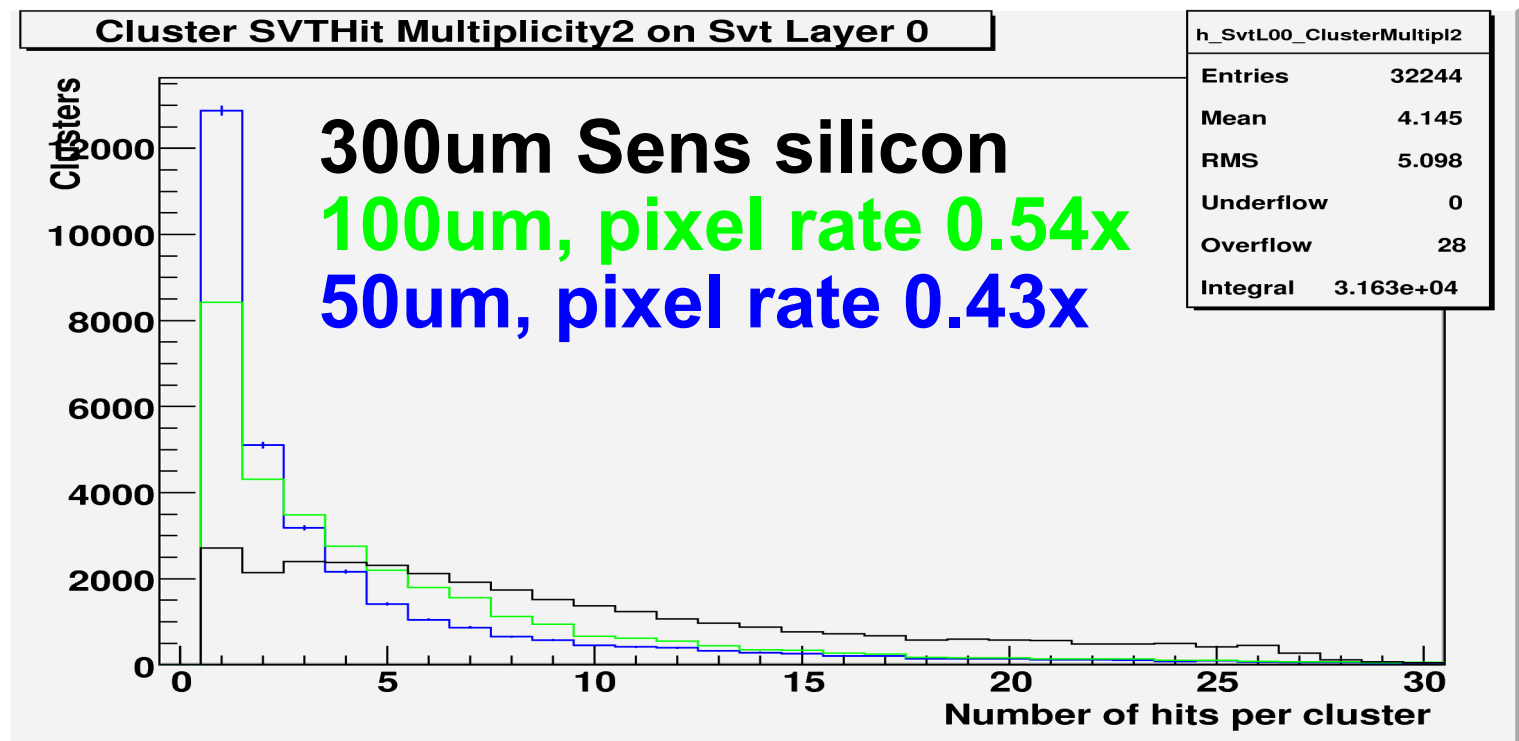
2photons (aka Pairs) bkg

- Additional information from Truth and Boundaries
- Origin of tracks that generates hits in L0, 95% directly from interaction point
- Same happens for RadBhabha



2photons (aka Pairs) bkg

- Pixel rate if we considered as sensitive only a reduced thickness of silicon (MAPS)
- Distribution of cluster multiplicity with different thickness of sensitive silicon, 300, 100 and 50 um
- Distribution are different, but tail is still there and total pixel rate does not scale exactly with thickness



Conclusions

- Production allows us to have statistically significant plots for RadBhaBha bkg
- No significant change in rates, but magnetic field configuration needed for RadBhabha generates wrong results for L0. Need a common configuration asap (work in progress)
- Most part of the bkg on L0 are particles coming directly from IP
- Pixel rate is not linearly dependent from thickness of sensitive silicon

Svt details

- **Bruno r353**
- Geometry:
 - Beampipe (BP): 1mm thick, Rmin 10mm
 - Gold foil inside BP: 3um
 - SVT Layer 0 is a tube, not a pin-wheel
 - SVT L0 length 10 cm, thickness 300um, Rmin 1.3cm
 - BP and L0 centered at $z = 0$