

Update on the RoI size studies.

1. Statistics

	# Events	# RoIs ¹	# RoIs processed ²
Low Luminosity	<i>4,500</i>	<i>4,594</i>	<i>4,258</i> <i>(92.7%)</i>
High Luminosity	<i>9,000</i>	<i>9,739</i>	<i>8,268</i> <i>(84.9%)</i>

Select the cluster which is closest to the RoI in eta/phi space.

¹An event can have more than one RoI.

²The selected cluster must have positive energy and reasonable values of eta/phi (cluster + samplings).

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2. Defining the regions to work at.

- Forget about the eta borders. Work only in terms of energy:
 - a. **Barrel:** Non-zero energy at the 2nd barrel sampling ONLY.
 - b. **EndCap:** Non-zero energy at the 2nd endcap sampling ONLY.
 - c. **Transition:** Non-zero energy at BOTH the barrel/endcap 2nd sampling.
- Exclude region: The region where the method IS NOT applied (use the initial space points instead):
 - a. **Transition:** for the moment.
 - b. **Edges:** $|\text{Cluster_Eta}| > 2.4$.
 - c. what else to exclude..

3. Defining the efficiencies.

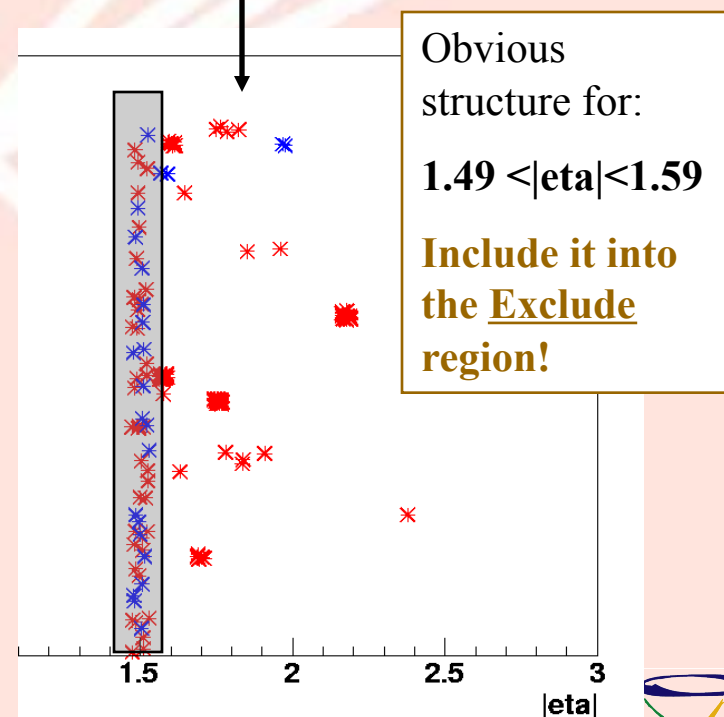
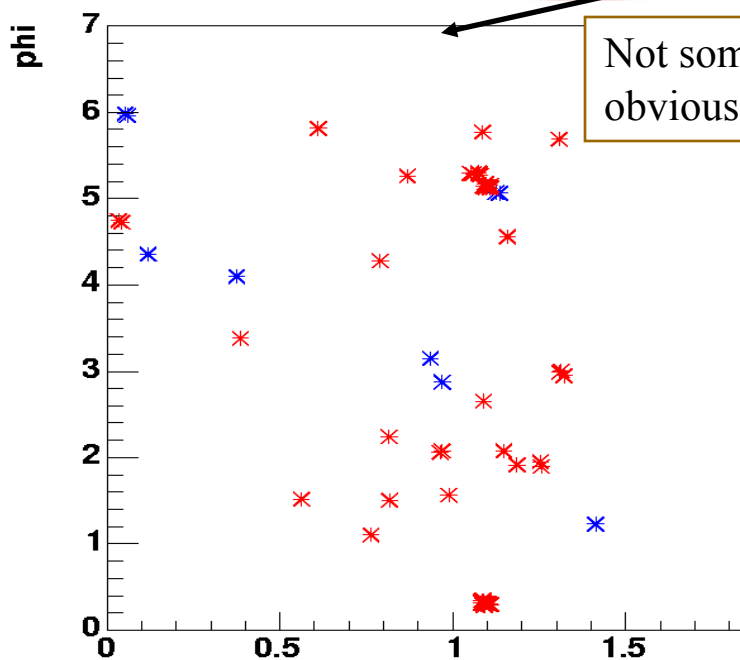
$$|Z_V^{\text{IDSCAN}} - Z_V^{\text{True}}| < 2\text{mm}$$

- Barrel, Transition, EndCap
- Method was/wasn't applied

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4. Fighting the RoIs with zero SP: A first overall view

# RoIs with zero SP	In Barrel	In Transition	In EndCap
Low Luminosity	10	0	24
High Luminosity	54	0	123



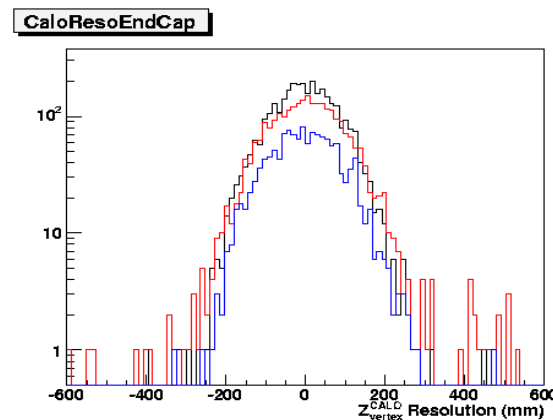
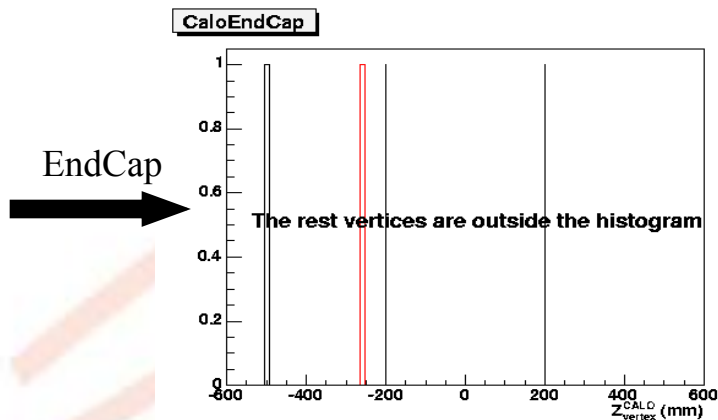
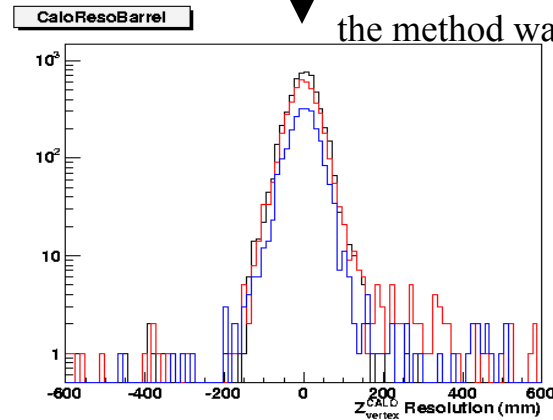
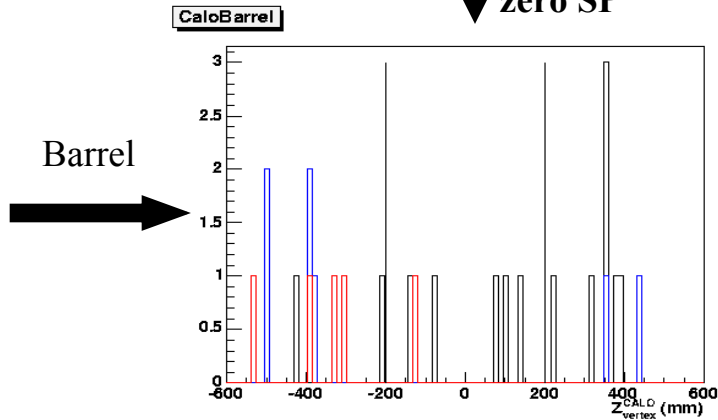
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5. Fighting the RoIs with zero SP: A first overall view

Question: What's the Z_v of all the events which result in zero SPs?

Z from Calorimeter.
Only the events with
zero SP

Resolution on Z from
 Calorimeter.
All the events where
 the method was applied



Conclusion:

The majority of the events with zero SPs have $|Z_v| > 200$ mm

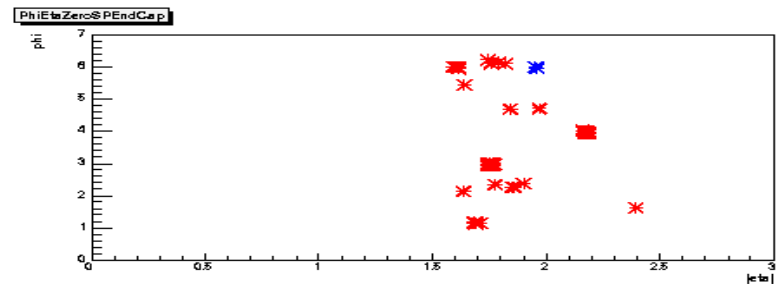
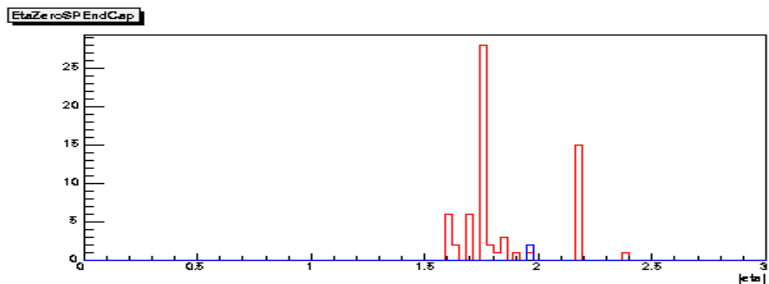
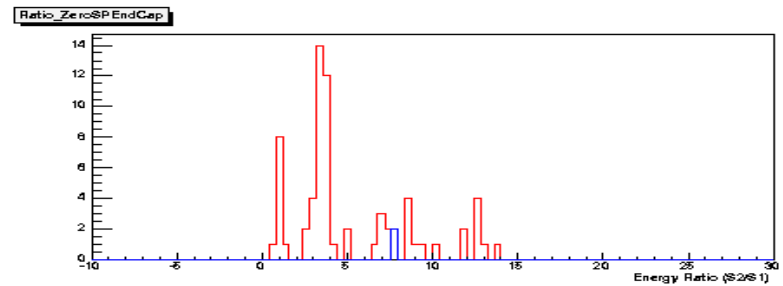
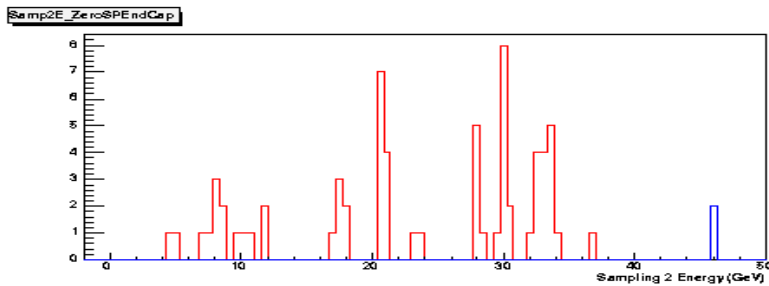
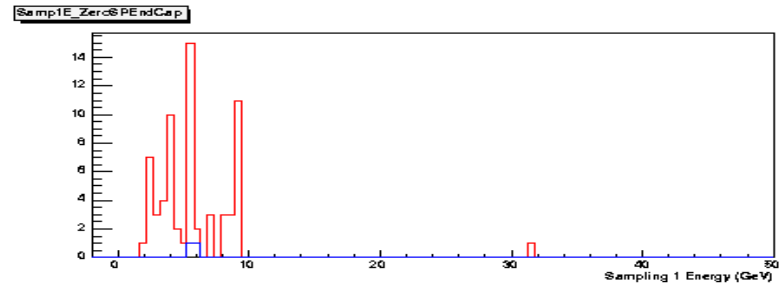
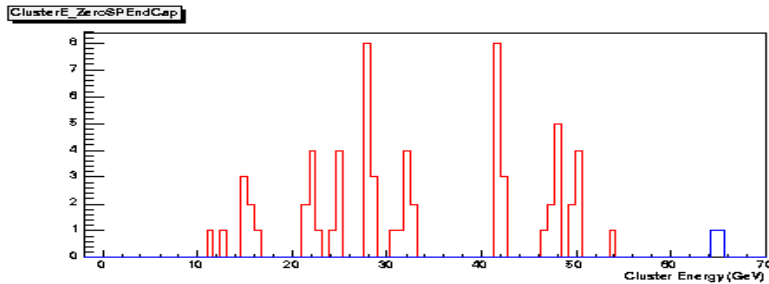
Zero SPs $\Leftrightarrow |Z_v| > 200$ mm



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6. Fighting the RoIs with zero SP: The EndCap Case

# RoIs with zero SP	In EndCap
Low Luminosity	2 (after 24) -92%
High Luminosity	66 (after 123) -46%

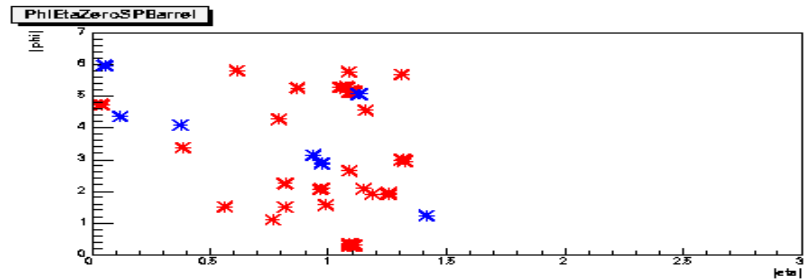
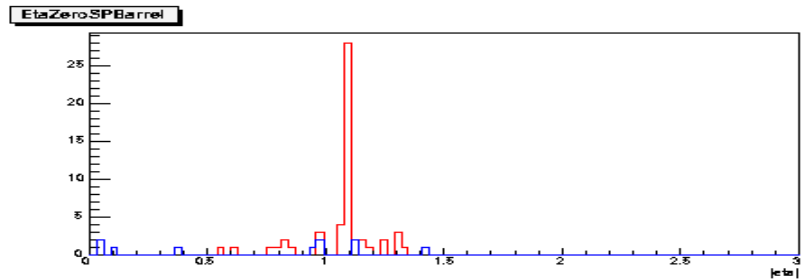
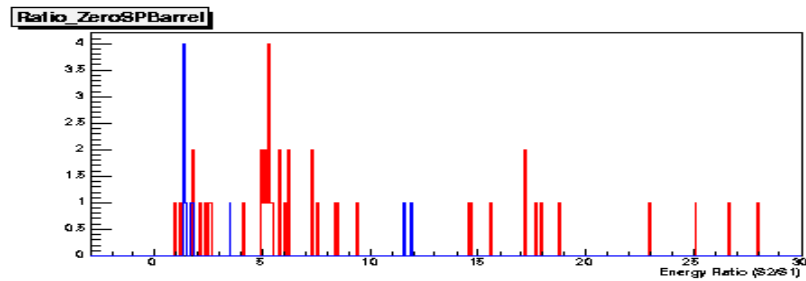
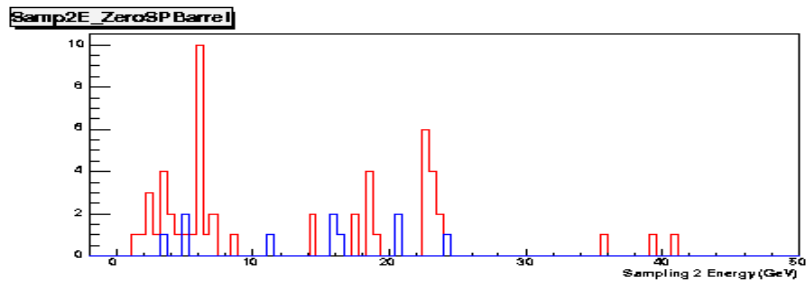
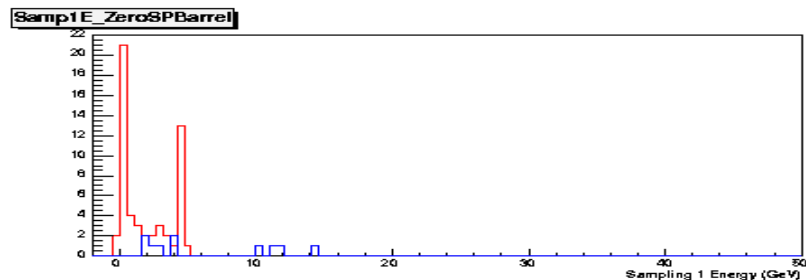
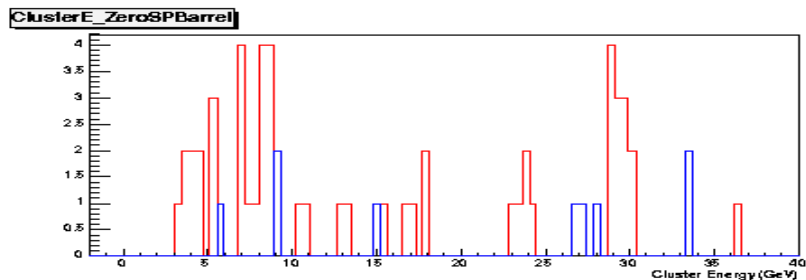




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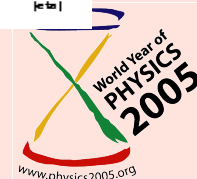
7. Fighting the RoIs with zero SP: The Barrel Case

# RoIs with zero SP	In Barrel
Low Luminosity	10
High Luminosity	54



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8. Conclusions - How to proceed - Next Steps

- Not obvious reason for the abnormal behavior.
- The previous distributions should be checked against the “normal” events.
- In the worst case, we must impose the condition “if the method doesn’t work, then don’t apply it...”. Do we have this luxury at the HLT?
- Check the efficiencies and the timing with the above condition.
- It’s fair time to close the RoI by determining the opening angle. Needs the Calo resolution. No truth info available!!
- Discussions made for using T2Calo. Better behavior then?