# HotSpots Investigation

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**L1 EMCal Trigger**

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# Overview

## Aim

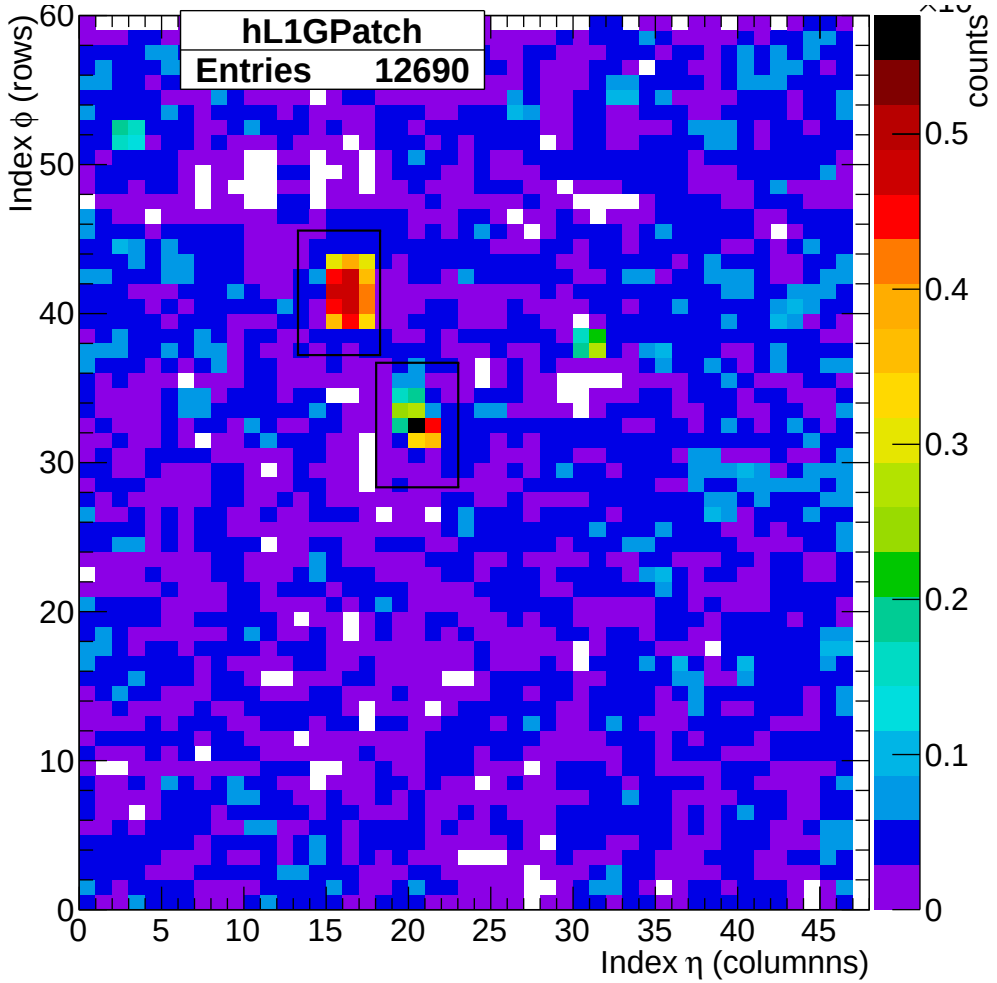
How sensitive are we to fake L1G trigger due to hot spots ?

- Study the $\eta : \phi$ coordinate of patches that are not related to energetic enough cells for different runs with hot spots
- Plots not normalized for now
  1. L1 gamma patches with no cell at the same location that are energetic enough to trigger
  2. max L1 gamma patch in an event with no energetic cell in this event
  3. energy distributions
- *If you have other suggestions of plots, let me know...*

- Run studied (for now): pp 188123, 7.48559e-06 events
- Energy threshold used 10 GeV : 15 fake events
- root file /alice/cern.ch/user/c/csilvest/QA_trigger/outputMerged/QA
- QA code: $ALICE_ROOT/PWGGA/EMCALTasks/AliAnalysisTaskEMCALTriggerQA.cxx

# L1 Gamma Patches

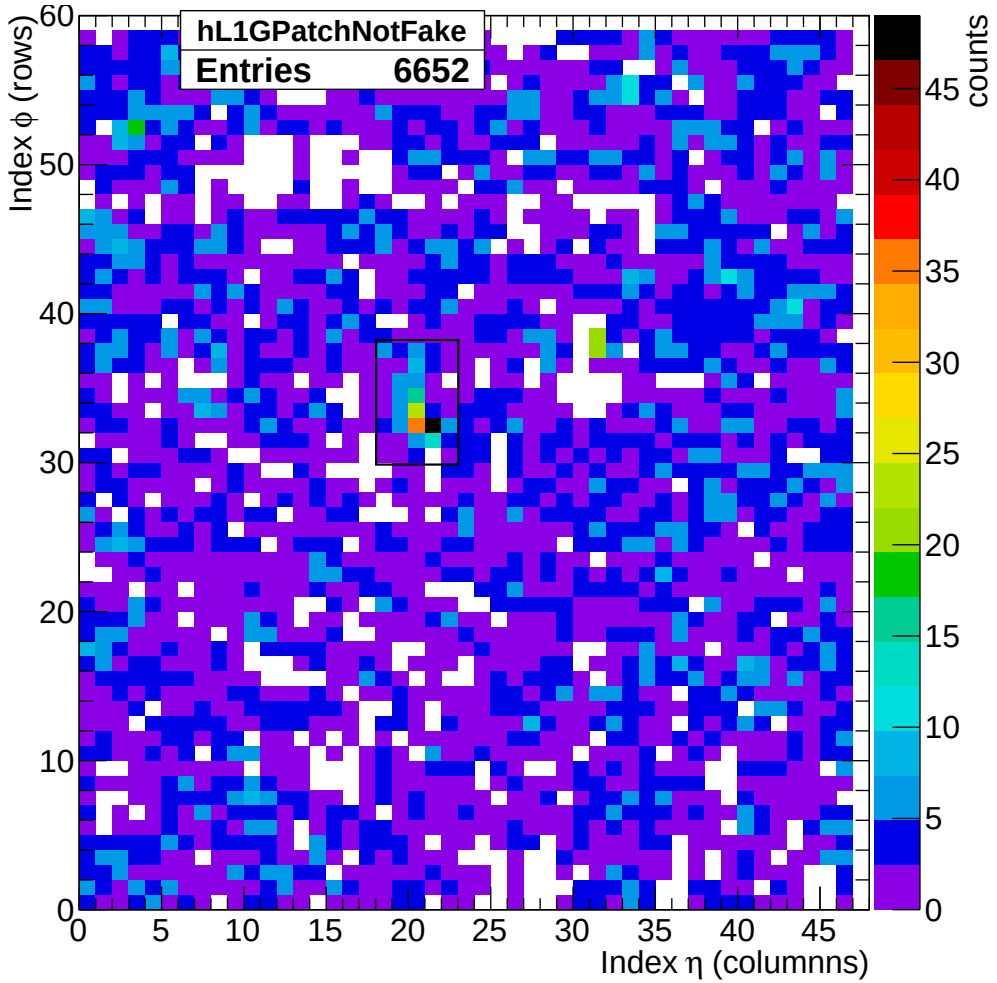
All gamma patchs from looping on AliESDCaloTrigger.




2 hot spots visible.

# L1 Gamma Patches Not Fake

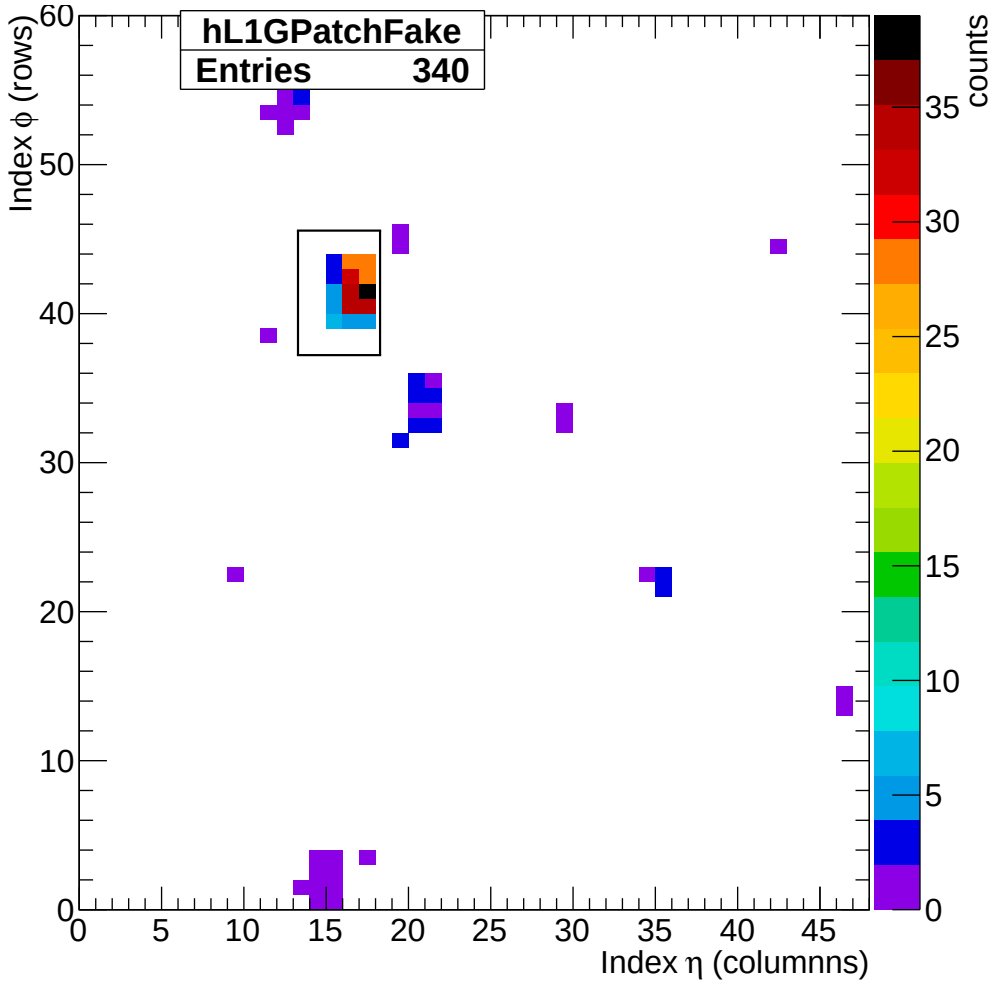
FOR with associated L1 gamma patches for which the cells at the same location are above the L1 gamma threshold ∼10 GeV




There seem to be only 1 real hotspot ?

# L1 Gamma Fake Patches

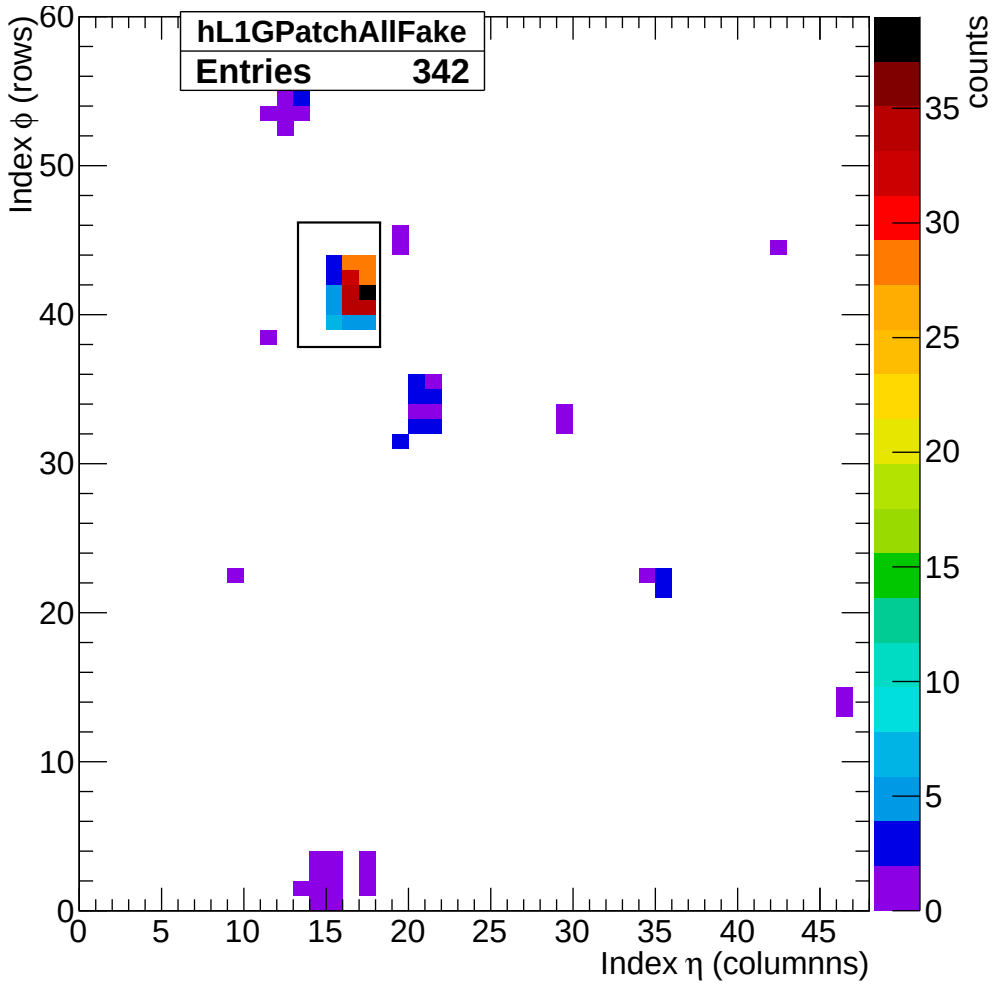
FOR with associated L1 gamma patches for which the related cells energy is less than the threshold ∼10 GeV




There seem to be 1 fake hotspot ?

# L1 Gamma Fake Events

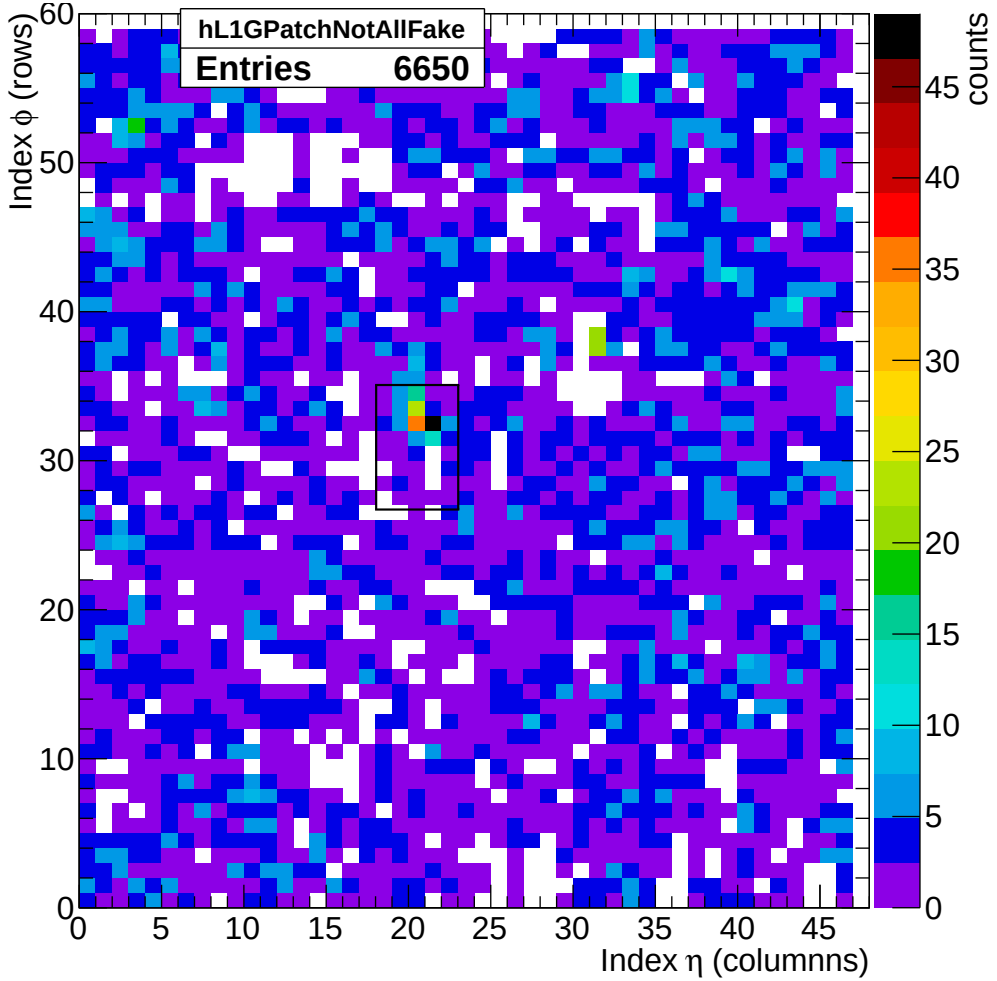
Patches position in fake events (where none were associated to enegetic enough cells)




(Why is the number of entries here above those of the previous slide ? Bug not yet understood...)

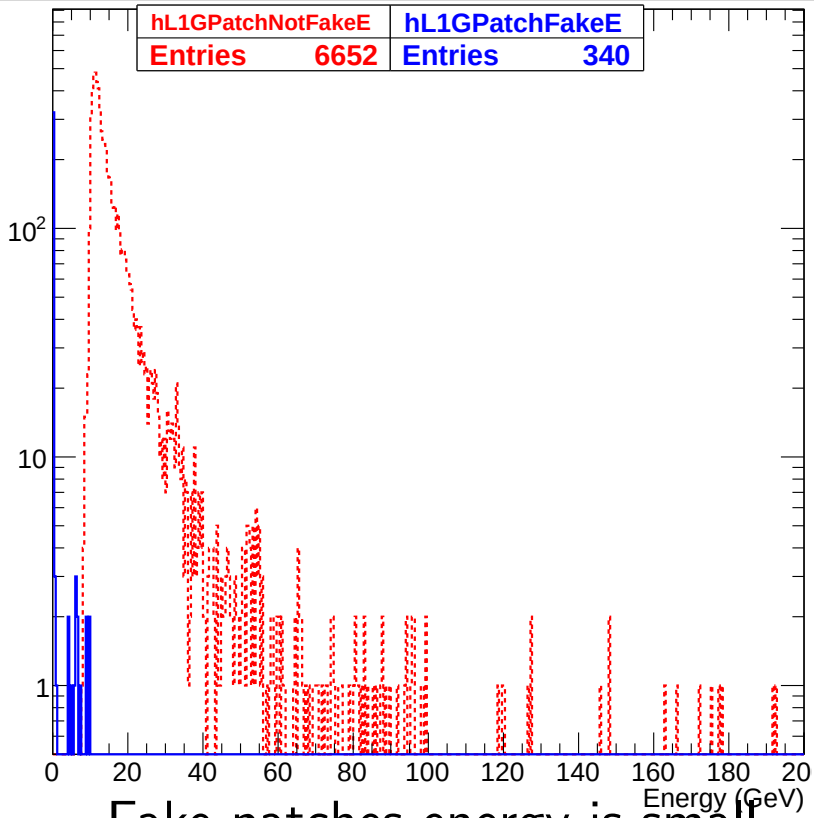
# L1 Gamma Patches None Fake Events

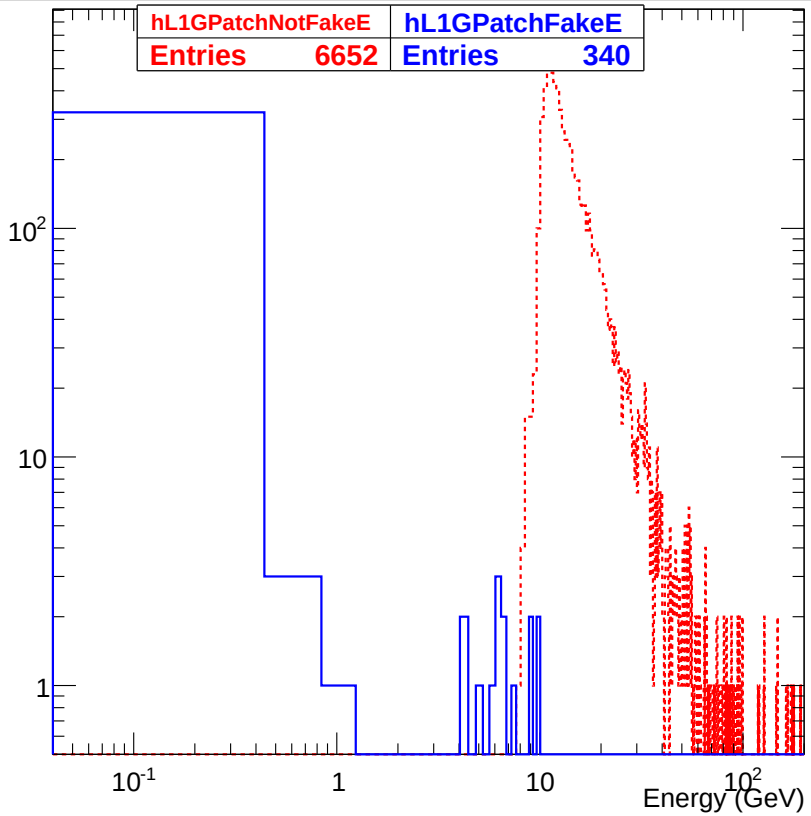
Patches position in none fake events (where at least 1 patch has it's related cells energetic enough)




The none fake hotspot still visible.

# Energy Distribution : Fake Patchs vs. None Fake Patchs

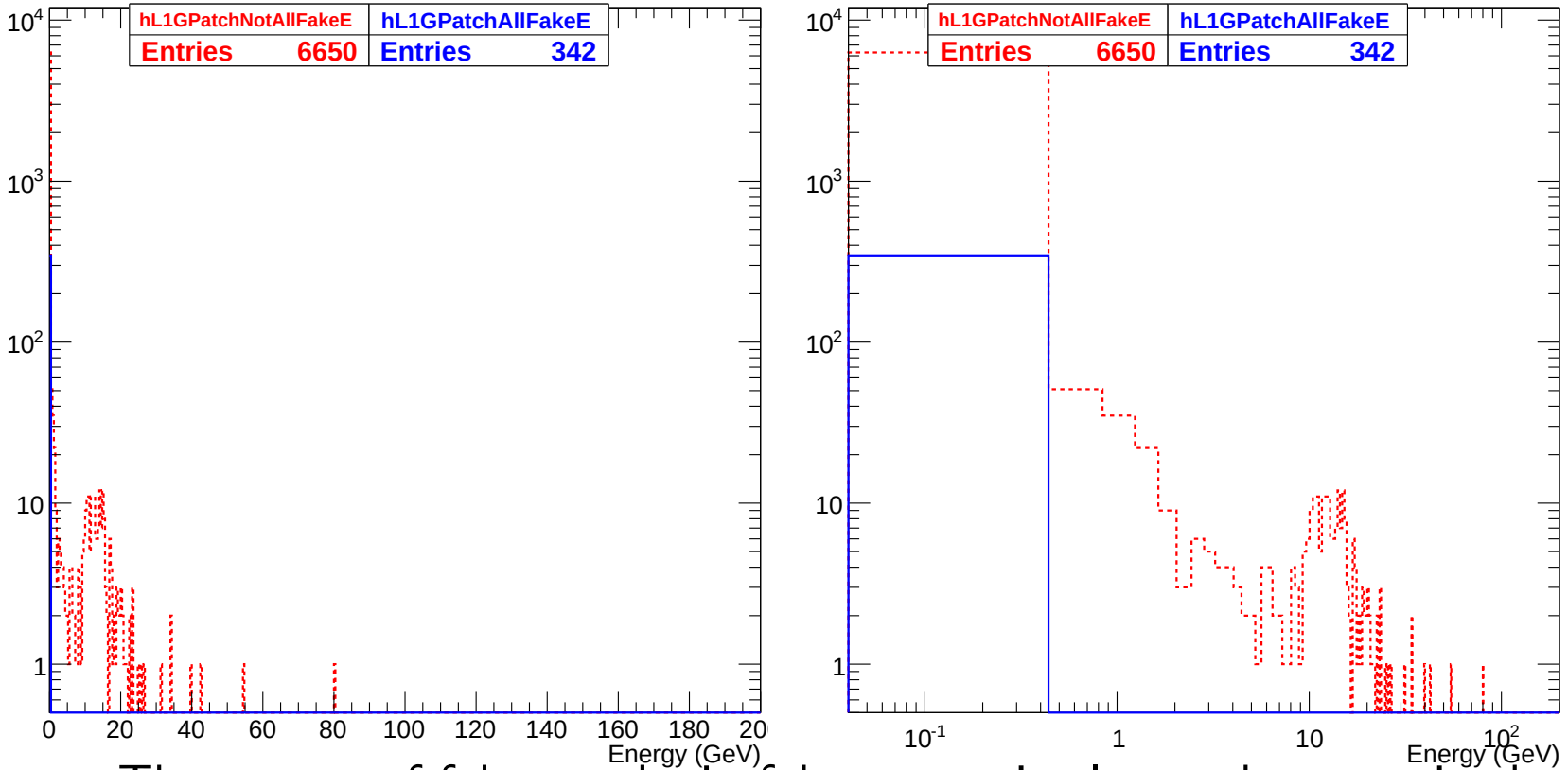



Fake patches energy is small.

The majority seem in the first bin.

# Energy Distribution Fake Events vs. None Fake Events




The energy of fake patchs in fake events is always the same in the first bin...

# Conclusion

## Summary

- There seem to be 1 real "hot spot" and 1 fake one.
- The fake hotspot is in a weird events.
- *Not sure how to proceed to understand better those fake events.*

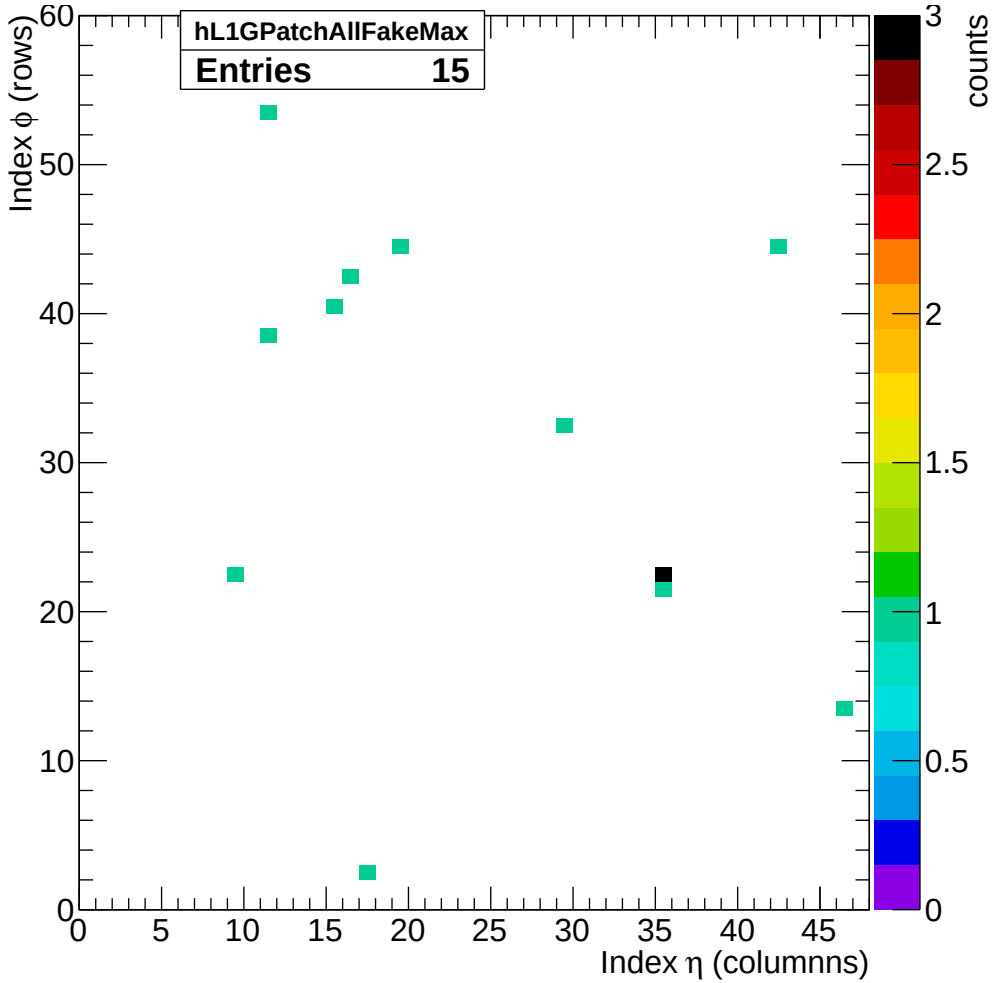
## Next

- Add information about the number of patchs (fake and not fake) per events, and in fake events
- Normalize when appropriate by the number of events or number of patches
- Look at other runs : suggestion of runnumber ?
- understand issue with the number of entries between slide 5 and 6.

# backup

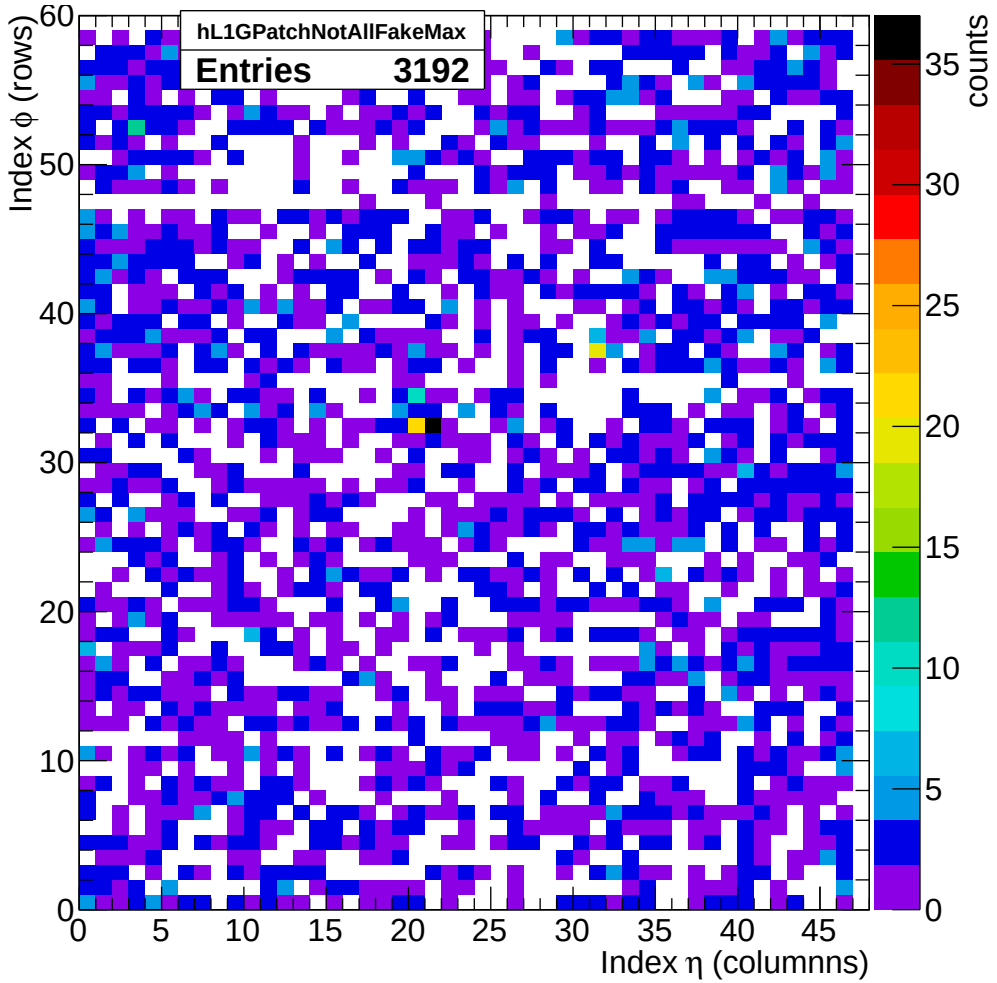
# Max L1 Gamma Patches in fake events

FOR in events where none of the cells pass the L1G threshold : fake events. The most energetic patch is the one plotted.



# Max L1 Gamma Patches in NONE fake events

FOR in events whereat least one cell passed the L1G threshold : not fake events. The most energetic patch is the one plotted.



# Maximal Patch Energy Distribution : Fake Events vs. None Fake Events

Maximal patch energy