Dear member of calorimeter group,

I would like to report several observation of the particular calorimeter problem, the so-called "ring of fire". According to my knowledge, the origin of this problem are known and Laurent an Robert created a code to detect such events. I hope my observation will be useful for developing the strategy how to eliminate such events in the best way.

Studying the influence the "bad" calorimeter cell on jets (see my talk on calorimeter meeting 23 September at agenda server). I found that after removing the "bad" cells the final η distribution for jets in MHT30_CJT5 skim contain a spike at $\eta = 1.9$ (fig. 1). The origin of it the 5 spikes in the 2d $\phi - \eta$ jet distribution at $\eta \sim 1.9$ and $\phi \sim 1.6, 3.1, 3.9, 4.7, 6.3$. These spikes were appeared because there is a noise in the FH calorimeter. These spike are present in run 178722. The Jet/MET quality for this run is unknown (not analysed) and zero bias monitoring quality is good. Looking throw the events one see that these spikes are secondary effects on the "ring of fire" presented in calorimeter (see fig. 2) or probably they are the secondary effect of some noise witch also leads to the "ring of fire".

Some observation about such events.

1. There are at the least several hundreds of events with "ring of fire" in the run 178722 in the thumbnail file recoT_all_0000178722_mrg_102-116.raw_p14.03.01. The first event detected by me in this file is 14963600. After that near 1 events from 10 IS NOT AFFECTED by "ring of fire"! All other are affected. The zero_bias and min_bias events are not affected. Probably it is mean that an origin of the external noise appears only during the collision.

2. The typical events has following configuration. 2 "ring of fires" are present. One with positive η another with negative. Sometimes the "ring of fire" with positive η is not present. The layers mostly affected are (E means typical energy in the cell in GeV):

   - EM1 $\eta = -15, E \sim -0.2$, $\eta = 15, E \sim -0.2$
   - EM2 $\eta = -15, E \sim -0.15$, $\eta = 15, E \sim -0.15$
   - EM3 $(floor3, 4)\eta = -14, E \sim +0.25$, $(floor5, 6)\eta = 14, E \sim -0.25$
   - EM4 $\eta = -14, E \sim +0.9$, $\eta = 14, E \sim -0.3$
   - all other layer affected a little or not affected

   I want to note, that signal is positive only in layers EM3 and EM4 for the negative η.

3. If only ring of fire is present, nothing special can be seen in the jets η distribution. Very often these events have also a big noise in CH near $\eta \sim \pm 1$ and sometimes noise in FH. These secondary effects are clearly seen in the distribution.

Propositions.

- If the observation 1 is valid for most cases when "ring of fire" is present one is obliged to mark the corresponding luminosity blocks as bad. Of course it is necessary to do such data quality check for all collected data.

- It it seems that online monitoring can be useful. Such monitoring can allow to study the problem and make an on-the-fly report about noise appearance. For this the dq_calo monitoring tool can be used, but the second physical data stream should be implemented.

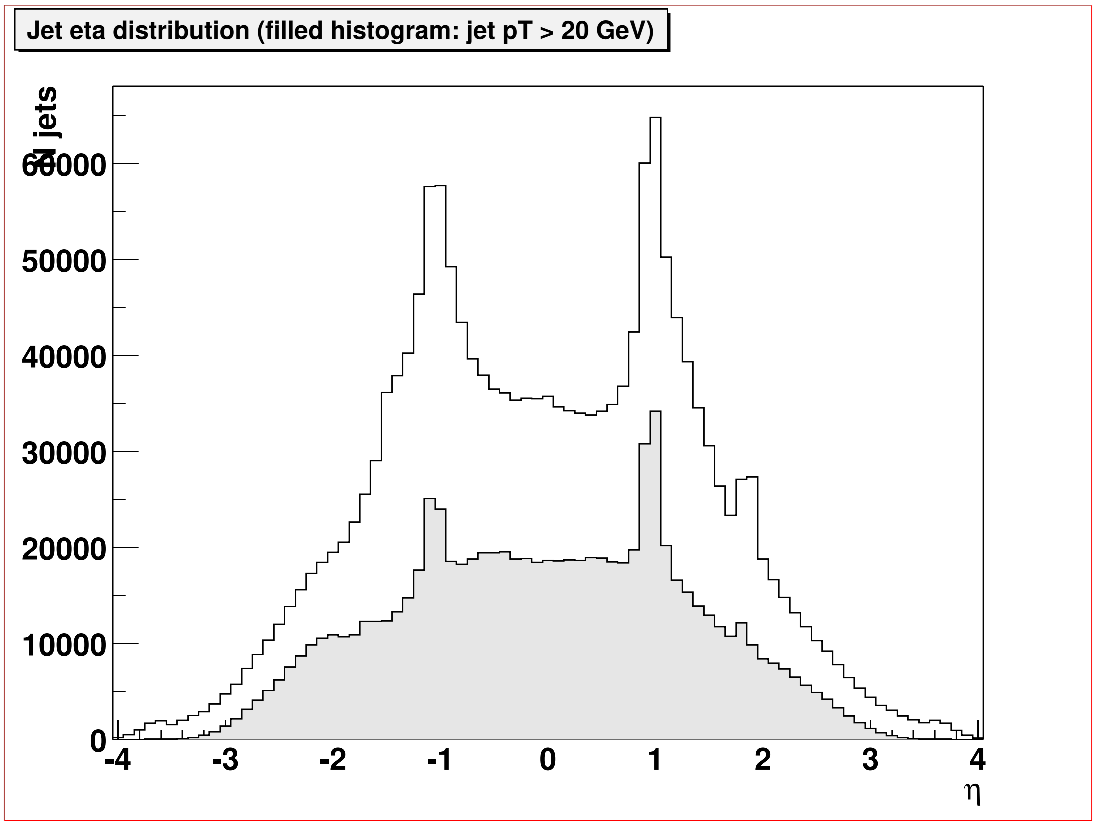

Figure 1:

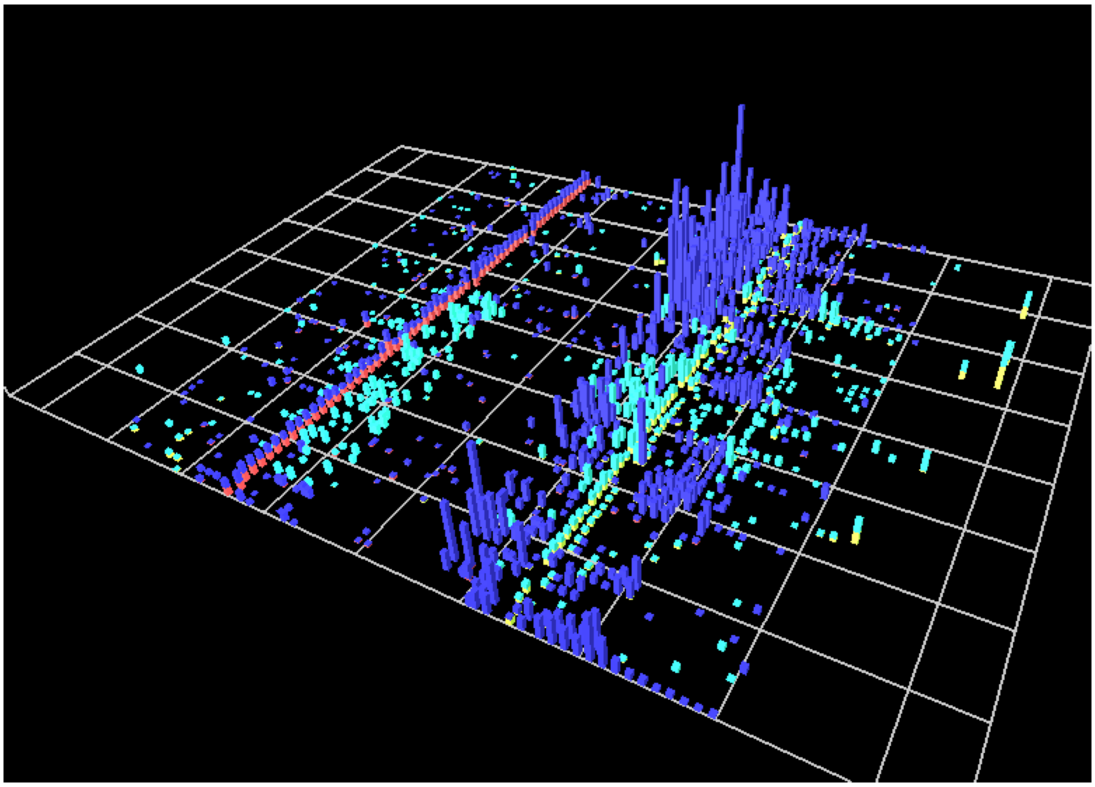

Figure 2: