Data

- Data (7 TeV): minbias stream
  - Solenoid field on
  - Trigger MBTS_1_1 .AND. MBTS timing ($\Delta t_{A\text{-}C}$<10 ns)
  - ➔ **5 M** collision candidate events from MinBias stream

- Measure EM calorimeter occupancy :
  - One hit = cell with **E >** **200/50/125/125** MeV in S0/S1/S2/S3 $|\eta|$<1.4
  - One hit = cell with **E >** **550/65/125/125** MeV in S0/S1/S2/S3 1.5<$|\eta|$<2.5

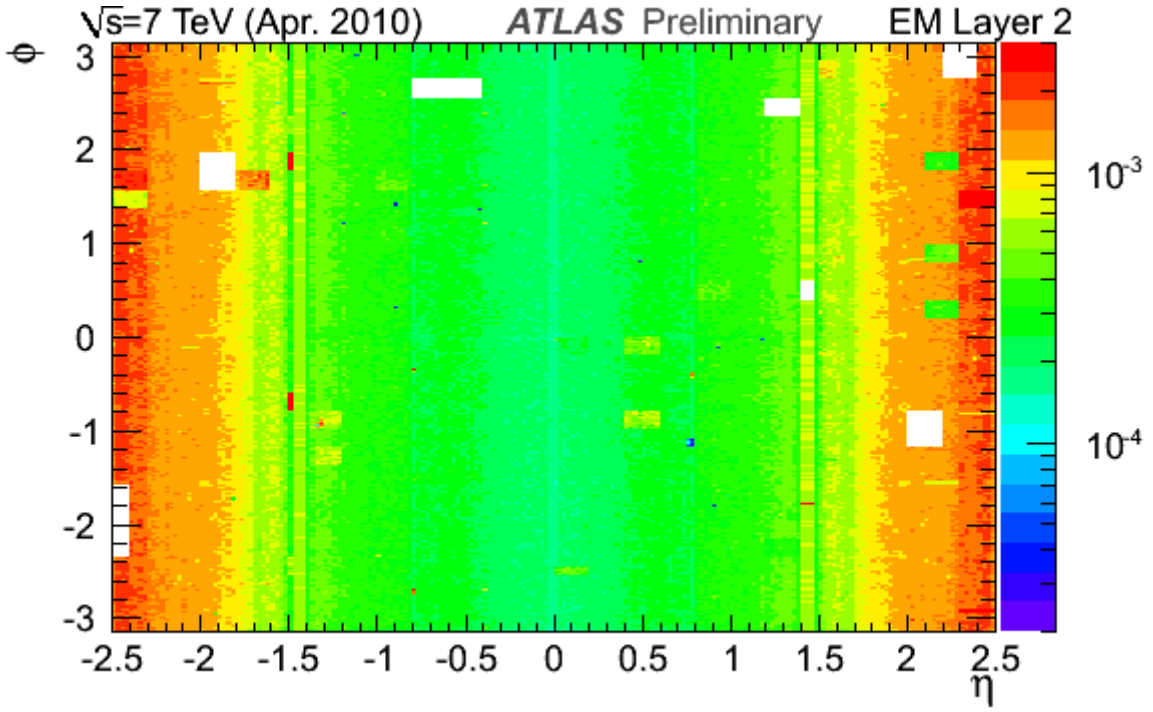
~ 5 σ_{noise}

EM Occupancy map (1)

$\eta-\phi$ occupancy map per event measured in the main EM calorimeter layer in the precision region ($|\eta|<2.5$)

- The $\eta-\phi$ bin size is equal to 1 cell, resulting in **50176** bins. In the region $1.375<|\eta|<1.475$ where barrel and endcap cells overlap, only barrel cells are choosen
- The blank areas are dead readout regions [**1.3%**],
- $\Delta\eta x\Delta\phi=0.2x0.2$ rectangles are non-nominal HV regions [**6%**]. When a HV is not nominal, a correction factor is applied on the energy reconstruction to correct for it. In this case, the noise increases and therefore the occupancy. In 3 regions ([$2.1<\eta<2.3$ + $0.2<\phi<0.4$, $0.8<\phi<1.0$, $1.8<\phi<2.0$]) the occupancy is lower because of cabling swap (see after). It is also the case in a fourth one [$-2.5<\eta<-2.3$ + $1.4<\phi<1.6$] under investigation.
- Smaller visible regions correspond to problematic cells (masked in standard ATLAS reconstruction) [**0.1%**]

EM Occupancy map (2)



EM calo commissioning with collision (1)

This study checks exhaustively the response of each individual EM calorimeter cell belonging to all longitudinal layers*, including presampler, allowing to spot

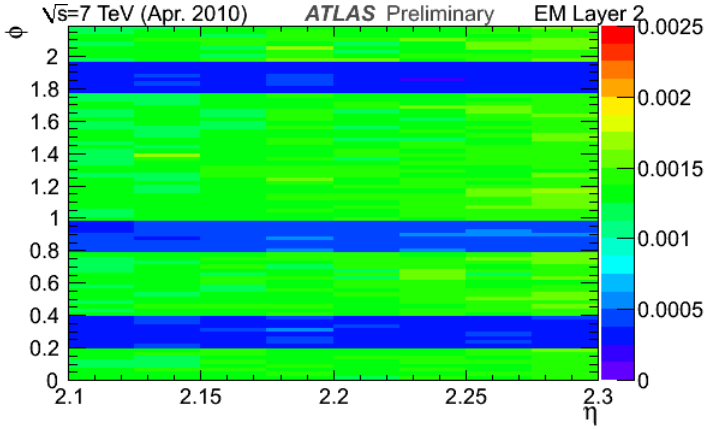
- 3 HV lines feeding 3 zones $\Delta\eta x\Delta\phi$=0.2x0.2 uncorrectly plugged (each zone is fed by two different HV lines providing redundancy): now hardware corrected end of april and illustrated in the main layer [Upper plots]. Second order residual effect after correction still under investigation
- a readout cabling inversion in first EM layer (1←→2, 3←→4): now offline corrected before 2010 LHC restart [Lower plots]. The step at η=-2.3 reflects the change of the first EM layer cell depth

➔ This method based on minimum bias events, triggered and selected only on MBTS information, check the response of all EM calo cells and allowed to identify and correct O(**0.4**%) of mis-behaving cells.

* Occupancy per event is roughly two times larger at $\sqrt{s}$=7 TeV compare to $\sqrt{s}$=0.9 TeV

EM calo commissioning with collision (2)

Before correction



After correction