Search for exotic diboson production in the $\ell^+\ell^-$ + large-R jet final state with the ATLAS data from the LHC pp run at $\sqrt{s} = 13$ TeV

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The RPC detector has been running steadly during the ATLAS data taking of 2015. The detailed performance in terms of detector efficiency and muon trigger efficiency has been measured with a large data set recorded during the LHC pp run with 25 ns spacing between colliding bunches at $\sqrt{s} = 13$ TeV. While these data, corresponding to an integrated luminosity of 2.3 fb^{-1}, were collected the RPC system was running in rather stable conditions. Therefore, the sample allows a careful study of the response of the system and, in addition, the strip-panel efficiencies and cluster size distributions measured with it are a valuable input for the production of a new round of the official ATLAS simulation production. These MC samples are currently being processed and will reproduce with good accuracy the running conditions for each detector as observed in the most recent data taking, thanks to the emulation, at digitisation level, of the measured detector conditions. The $\eta \times \phi$ distribution of the RPC hits in the pivot plane contributing to high p_T muon triggers in the barrel of ATLAS is shown infig. **??**. The grid of the strip panels, showing the segmentation of the RPC detector in the pivotal plane of the trigger logic, is superimposed to the distribution of the trigger hits. The un-instrumented region around $\eta = 0$ correspond to holes in the barrel structure dictated by services; the holes in the acceptance at around $\phi = -1$ and $\phi = -2$ correspond to the region of the ATLAS feet, where the mechanical structures supporting the ATLAS calorimeters prevent an hermetic coverage of the barrel. BME and BOE RPC chambers, as well as the extra BOG and BOF chambers in the outer part of the feet sectors are not shown in this plot, since the commissioning of most of these chambers and the integration in the ATLAS DAQ didn't take place until the end of the 2015 run.

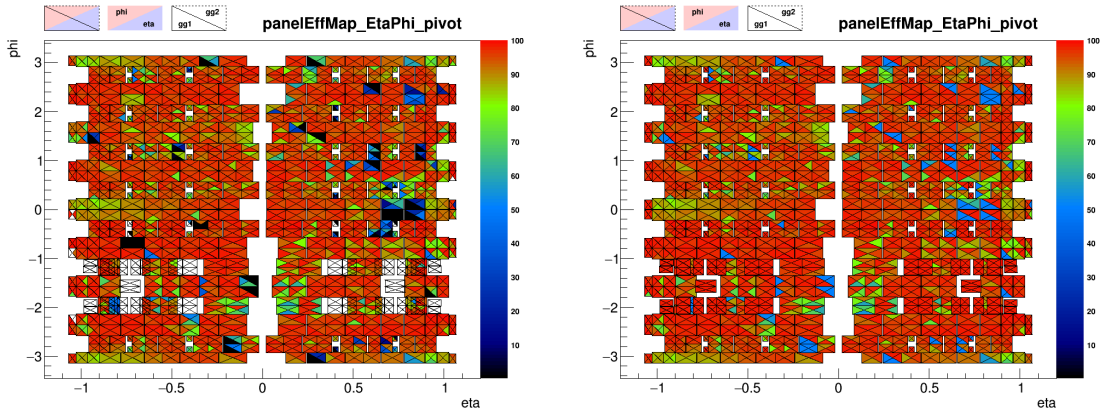

Figure 1. Color-coded map of strip-panel efficiency (ϕ and η) for the two gas gaps of all RPC in the pivot plane, as measured in 2015 data (25ns bunch crossing sample) -on the left- and as injected in the simulation production to be used in 2016 (conventionally referred as MC15c) -on the right. White area on the left plot correspond to the BME RPC chambers, the extra BOG and BOF in the outer part of the feet sectors and any other strip panel where the measurement was not possible due to lack of extrapolated muon tracks.

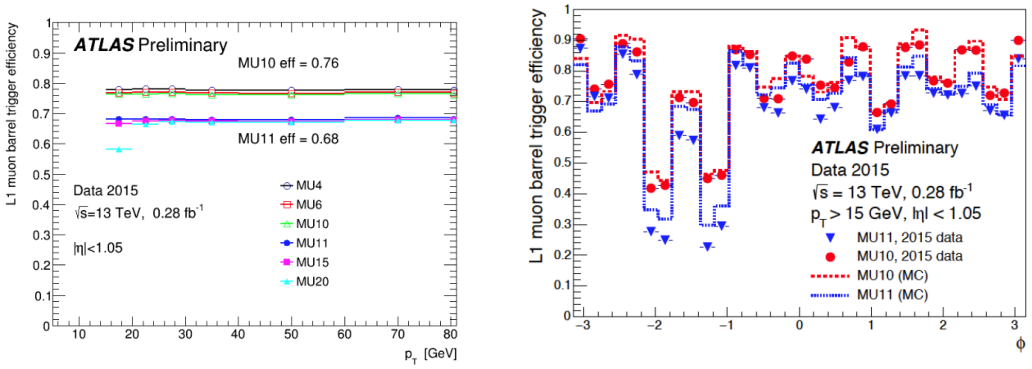

Figure 2. LVL1 muon barrel trigger efficiency for reconstructed muons with $p_T > 15$ GeV and $|\eta| < 1.05$ as a function of transverse momentum (left) and ϕ (right). The efficiency is shown for the six Level-1 thresholds: MU4,MU6, MU10 which require a coincidence of the two inner RPC stations, and MU11,MU15,MU20 with a further coincidence on the outer RPC stations. On the right, only one low p_T and one high p_T thresholds are shown. The dashed histograms show the results from a special MC simulation which includes measured efficiencies of the RPC chambers. The efficiency was measured using events selected by independent triggers.

REFERENCES

1. G. Chiodini, M. Corradi, S. Rosati, G. Salamanna, S. Spagnolo, "Plots on RPC / L1 Muon Barrel Trigger Performance in 2015", ATL-COM-MUON-2016-005, https://cds.cern.ch/record/2131167/