

Minutes of the Coral-weekly meeting, 19/09/2018

Communications:

- Meeting with SPSC referees will take place 2 weeks earlier than foreseen.

1) Renat – 2018 alignment

- Comparison between 2015 and 2018 data
 - From HMEs it looks like in 2018 there is a problem with GEMs and RW (pseudo-efficiencies are considerably lower compared to 2015), DCs are also showing some instabilities. Nevertheless, Straws seem to be better in 2018 as well as some of the MWPCs.
 - For RW there were hardware issues (worse gas flux, problems with some of the ports), which could explain partially the inefficiency. It might also be related to the tracking. In the tracking the zone between SM1 and SM2 is subdivided into sub-zones. One sub-zone is between SM1 and RICH (DCs, ST, GEMs), the other is the region which includes RW, PS1 and GEM4. In the latter region, Yann is applying a special procedure: if one of the detectors has hits, the others may be disregarded, which might affect the efficiency (similar to W45+PB case). The good thing would be to check the true efficiency for RW.
 - It seems that illumination of RW is different in 2015 compared to 2018. One thing to check would be to make a comparison taking only physics triggers because the trigger mix is pretty different between 2015 and 2018 (more RT in 2018, no beam-trigger in 2018, CALO in 2018, no single muons triggers (LAST_1mu, OT_1mu, MT_1mu) in 2018).
 - For RW in the 2D pseudo-efficiency plots an empty band is present in the bottom of all X-planes and correspondingly also in the right side of all Y planes. Checking the cool plots it was clarified that the band cannot be related to some missing channels. The origin of the bands remains unclear. Nevertheless, this region is not covered by the physics triggers, but still the problem should be clarified.
 - For GEMs with new calibrations the timing looks fine, but the detectors still seem to be less efficient compared to 2015. The GEM-planes are coupled detectors X-Y and U-V which stay very close to each other and since we see different kind of inefficient shapes for X and Y or U and V it indicates that the problem is related to the detector itself. One suspicion is that there are some aging related deficiencies. But this scenario is being negated by the experts. It would be important to check the true efficiencies.
 - Renat: alignment of GEMs on physics data and alignment data yields different results (different residual distributions and slightly different positions (within 1/3 of residual)). Good alignment was achieved only on physics data. Differences between residuals obtained using physics data and alignment data were already observed in 2015 for MMs. Robert explained this looking at tracks at low and large angles (low/high momenta). Alignment tracks are mostly straight, while in physics data we have different angles and planes may have a different illumination.
 - Looking at the plots, Muon wall pseudo-efficiencies also change a lot between alignment and physics data (pseudo-efficiencies are higher for the physics data). Marcia: can it be that low-momenta tracks (which are present in physics data and not in alignment data) will reach MW with large uncertainties (passing calorimeters) and will pick-up more easily a hit.
 - While MW pseudo-efficiencies look better with physics data, DCs and GEMs look worse with physics data. For DC0/DC1 it can be related to higher intensity of physics data. But intensity effects should be accounted by the correct RTs (Alain). Indeed, there must be two different sets of calibrations for DC0/DC1: for low and high intensity. Those calibrations should be then used accordingly for low intensity (i.e. alignment data) and for high intensity data. Still DC0/DC1/DC4 calibrations are not yet finalized/committed; Charles is working with no success yet (> 2 months?).
 - Another observation is that in the alignment procedure MMs have strong impact on GEMs and on overall alignment.

- Robert is not available to do an x-check of alignment, but he can share the experience. Suggestion to Renat to clarify with Robert all possible details and procedures e.g. sequence/combinations of detectors to be fixed/aligned.