Minutes of the conveners' discussion at the
2nd meeting of the LHC Minimum Bias and Underlying Event WG, May 31 2010

(1) Dates of next mtgs:
o We confirmed Sept 6 -7 for the next mtg. We shall start on Monday 6 after lunch, continue on Tue morning, and use the Tue afternoon if necessary.
o We agreed to suppress the possible mtg in December, since it would be very close to MPI2010, organized in Glasgow in the week of Nov 29.

(2) Status of implementation of recommendations for common MB plots
We expect to have the plots ready for presentation and discussion at the next WG meeting in September. We agreed to adopt the same cuts used for the "luminosity" exercise, namely:

  a. consider events with at least one track in |eta|< 0.8, with pt>0.5 GeV (as well as pt>1 GeV -- (was 0.9, but we're using 1 GeV in the lum plots)
  b. correct to the hadron level, using perugia 0 to determine trigger efficiencies etc.
  c. NO correction to remove SD/DD contributions (analysis "a la atlas")

The details for the plots were later discussed in a small subgroup, including MLM, Peter Skands, Chiara Zampolli (ALICE), Emily Nurse (ATLAS) and Rick Field (CMS). The resulting recommendation, given here below, was endorsed by the full group of conveners on behalf of their experiments:

(2.1) MB plots (total of 6 plots for each energy):
General statements:
- For all plots, events entering the plots are required to have at least 1 track with |eta|<0.8 and (a) pt>0.5 GeV or (b) pt>1GeV
- distributions are corrected to the particle level, accounting for trigger/tracking/etc efficiencies. No subtraction of specific contributions, like diffraction. - sqrt(S)=900 and 7000 GeV
- "charged particles" include leptons
- no particle-level corrections to subtract electrons from Dalitz decays

  1. MB1(a) and (b): d Nchg/deta: - definition: include all tracks above 500 MeV (for plot (a)) and above 1 GeV (plot (b)), over the available eta range (namely this can extend beyond 0.8 for ATLAS/CMS). Binning: bin-size=0.2 in eta, starting at 0.
  2. MB2 (a) only : d Nchg/dpt: - definition: include tracks with |eta|<0.8, and all pt values. Binning: 100 MeV in the region [0-1GeV], and free binning beyond
  3. MB3 (a) and (b): d N/ d Nchg: - definition: include tracks within |eta|<0.8, with pt>500Mev (plot (a)) and pt>1 GeV (plot (b)). Bbinning: 1 unit of Nchg in the range [0.5 - 10.5], and free beyond that
  4. MB4 (a) only: <pt> vs Nchg: - definition: include tracks within |eta|<0.8, with pt>500Mev. Binning: same as MB3

(2.2) UE plots (total of 12 plots for each energy)

  1. (UE1) Average charged particle density and average PTsum density in the "toward", "away", "transverse" region as defined by the leading charged particle, PTmax, for all charged particles with pT >= PTmin and |eta| < 0.8 (range covered by ALICE) with PTmin = 0.5 GeV/c. The average densities in the "toward" (not including PTmax), "away", and "transverse" region would be plotted versus PTmax in bins of size 0.5 GeV/c with the first bin equal to 0.5-1.0 GeV/c. (6 plots)
  2. (UE2) Average charged particle density and average PTsum density in the "toward", "away", "transverse" region as defined by the leading charged particle, PTmax, for all charged particles with pT >= PTmin and |eta| < 0.8 (range covered by ALICE) with PTmin = 1.0 GeV/c. The average densities in the "toward" (not including PTmax), "away", and "transverse" region would be plotted versus PTmax in bins of size 0.5 GeV/c with the first bin equal to 1.0-1.5 GeV/c. (6 plots)

To enhance the non-diffractive contributions, the proposal is to repeat the above plots requesting the presence of several central tracks. Numbers between 3 and 6 have been going around. We need to fix this criterion.

(3) Bridging to LHCb acceptance
Michael showed the results of the MB analyses in progress at LHCb. It would be very useful to connect the central analyses to the fwd ones accessible to LHCb. Again, it would be nice if few of us could sit down to think through some of the possible options that were mentioned during the discussion. I think that being able to bridge from the central to the fwd region would be great added value of all analyses.

(4) Repository of data/documentation for common plots
We need to decide how to document and where to host the data relative to the common plots ("data" here means the entries of the plots)
More in general, Kevin raised the more general issue of how to make available and quotable measurements which are more complex than simple 2-D plots. MLM suggested that some journals (e.g. EPJC) allow for the addition of supplementary information, to be stored with the electronic version of the publication.

A discussion of these issues with the CERN Library, with EPJC and with the Inspire team and with the experiments, is ongoing.