Contribution ID: **329** Type: **Contributed Talk**

First measurement of diffraction in pPb collisions and search for elliptic azimuthal anisotropies in γp interactions within ultra-peripheral pPb collisions, at $sqrts_{NN}$ = 8.16 TeV, with the CMS experiment

Tuesday, March 24, 2020 11:17 AM (17 minutes)

We present the first measurements of diffraction in $\sqrt{s_{NN}} = 8.16$ TeV proton-lead collisions within CMS. The very large angular coverage of CMS is used to tag rapidity gaps on both the proton-going and lead-going sides and to identify both pomeron-lead and pomeron-proton topologies. Since the previous highest energy measurement of these processes was at $\sqrt{s_{NN}} = 30$ GeV, the current data provides essentially unique information. The rapidity gap distributions are sensitive to the gluon distribution within nuclei but also provide important information for modeling cosmic ray collisions. The results are compared to predictions from the EPOS, QGSJET and HIJING event generators and discussed in the context of other measurements from both pPb and pp collisions. In addition, we present a first measurement of two-particle angular correlations for charged hadrons emitted from photon-proton, γp, interactions over a wide range of pseudorapidity and full azimuth. The γp events were produced within ultra-peripheral pPb collisions at $\sqrt{s_{NN}}$ = 8.16 TeV and were selected by requiring a large rapidity gap in the lead-going direction and no neutron emission from the lead nucleus. The results are compared to a sample of minimum-bias pPb events with same multiplicity. The observed azimuthal correlations at large relative pseudorapidity are used to extract the first, second and third-order two-particle anisotropy harmonics, V1D, V2D, and V3D as a function of track multiplicity and transverse momentum pT. For both the photon-p and minimum-bias pPb samples V1D is negative, V2D is positive and V3D is negative but consistent with zero. The single particle second-order harmonic, v2 (pT) is larger for photon-p events than for minimum-bias pPb collisions of the same multiplicity.

Presenter: MURRAY, Michael (The University of Kansas (US))

Session Classification: Small-x, Diffraction and Vector Mesons

Track Classification: Small-x, Diffraction and Vector Mesons