



Contribution ID: 225

Type: Oral Presentation

Azimuthal anisotropy of charged hadrons at very high p_T in PbPb collisions at 2.76 TeV with CMS

Tuesday, 14 August 2012 15:55 (20 minutes)

Measurements of the azimuthal anisotropy of charged hadrons are presented for PbPb collisions at 2.76 TeV over an extended transverse momentum range up to approximately 60 GeV/c. The data were collected with the CMS detector at the LHC. Utilizing a novel and unique high- p_T single-track high-level trigger, the analysis explores the full 2011 PbPb data set corresponding to an integrated luminosity of 150/ub. Anisotropy parameters (v_2 , v_3 and v_4) are extracted by correlating charged tracks with the event plane angle reconstructed using the energy deposited in the forward calorimeters. By utilizing the broad coverage of the CMS forward calorimetry, contamination from back-to-back dijets is suppressed. The results presented in this talk significantly improve on the statistical precision of previous v_2 measurements for $p_T > 12$ GeV/c, and explore for the first time the harmonic components of the azimuthal dependence in the very high p_T region beyond 20 GeV/c. Beyond $p_T > 10$ GeV/c, the observed v_2 values show a moderate decrease with p_T , being consistent with zero only above $p_T \sim 40$ GeV/c and for mid-central (30-60%) collisions. A common trend in the centrality dependence of v_2 is observed for particles over a wide range of p_T up to approximately 48 GeV/c that is independent of pseudorapidity, suggesting a potential connection to the initial geometry. These new data can impose quantitative constraints on the details of in-medium parton energy loss models, particularly the influence of the path length and the shape of the interaction region.

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Session Classification: Parallel 1C: Correlations & Fluctuations (Chair J. Schukraft)

Track Classification: Jets