

## Hadron correlations in CMS

*Tuesday, 29 May 2012 10:55 (25 minutes)*

The measurements of the anisotropic flow of single particles and particle pairs have provided some of the most compelling evidence for the creation of a strongly interacting quark-gluon plasma (sQGP) in relativistic heavy ion collisions, first at RHIC, and more recently at the LHC. Using PbPb collision data taken in the 2010 and 2011 heavy ion runs at the LHC, the CMS experiment has investigated a broad scope of these flow phenomena. The  $v_2$  elliptic flow coefficient has been extracted with four different methods to cross-check contributions from initial state fluctuations and non-flow correlations. The measurements of the  $v_2$  elliptic anisotropy have been extended to a transverse momentum of 60 GeV/c, which will enable the placement of new quantitative constraints on parton energy loss models as a function of path length in the sQGP medium. Additionally, for the first time at the LHC, the CMS experiment has extracted precise elliptic anisotropy coefficients for the neutral pi meson ( $\pi^0$ ) in the centrality range 20-80% and over a transverse momentum range 1.6 to 8 GeV/c. These results will be compared with both the  $\pi^0$  results reported by the PHENIX detector at RHIC and with the inclusive charged particle anisotropy results reported from the LHC. Finally, the CMS experiment has mounted an extensive study of charged hadron pair azimuthal correlations using a Fourier harmonic decomposition to fit the data. The relationship between these pair coefficients and the single particle harmonic flow coefficients will be explored for its insight in the early dynamics this viscous medium.

**Primary author:** MAGUIRE, Charles (Vanderbilt University)

**Presenter:** MAGUIRE, Charles (Vanderbilt University)

**Session Classification:** Plenary 2B