

Latest Results from the PHOBOS Experiment

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Over the past years PHOBOS has continued to analyze the large datasets obtained from the first five runs of the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory. The two main analysis streams have been pursued. The first one aims to obtain a broad and systematic survey of global properties of particle production in heavy ion collisions. The second class includes the study of fluctuations and correlations in particle production. Both type of studies have been performed for a variety of the collision systems, covering a wide range in the collision energy and centrality. A uniquely large angular coverage of the PHOBOS detector and its ability to measure charged particles down to very low transverse momentum (p_T) is exploited.

In this summary talk new results on the systematic comparison of the particle production in various collision systems (Au+Au, Cu+Cu, d+Au and p+p) are presented. These include the measurements of charged particle densities, antiparticle to particle ratios and two-particle angular correlations.

For Au+Au collisions at the top RHIC energy the high-statistics dataset enabled the measurements of the specific properties of the particle production process. The invariant yields of pions, kaons, protons and antiprotons with very low p_T are for the first time measured as a function of the collision centrality and are compared to the yields measured at 62.4 GeV Au+Au collisions. The centrality dependence of correlations with respect to high- p_T particles is studied over a large pseudorapidity range for associated particles. The structure in the near- and away-side correlation functions is investigated. The same dataset is also used to evaluate the non-flow contribution to the measured elliptic flow fluctuations. The resulting elliptic flow fluctuations are shown as a function of the collision centrality and its correspondence to the fluctuations in the shape of the overlap region of the colliding nuclei is discussed.