Quark Matter 2008 Conf. Feb. 4-10, 2008 Jaipur, India
"oral talk"

Calorimetry in PHENIX: today and in future

E. Kistenev [a)] for the PHENIX Upgrade Collaboration

[a]Department of Physics, Brookhaven National Laboratory
Upton, NY, 11933, USA, *kistenev@bnl.gov*

PHENIX is one of the two currently operational experiments at RHIC at BNL. Since inception its strategy relied heavily on calorimetry at midrapidities for triggering on the remnants of hard scattering in Heavy Ion and Nucleon-Nucleon collisions, for identification of charged and neutral leptons and hadrons produced in those collisions and measuring their energies. This approach resulted in the early discovery of suppression of particle production at large transverse momenta and other observations later used to substantiate PHENIX claims to QGP discovery. The advent of high luminosity RHIC running will allow to explore the QGP production to greater depth and to study the nuclear effects on parton distribution functions leading to QGP production. Reaching this new goal requires substantial enhancement to existing PHENIX particle spectrometers including calorimetry. The intent is to increase acceptance for calorimetry measurements from currently available $\delta\eta \times \delta\phi \sim 0.35$ to $\delta\eta \times \delta\phi \sim 20$ with two new calorimeters (Nose Cone in the rapidity range between 1 and 3 units and Muon Piston in the rapidity range 3 to 4 units) in each of the forward muon spectrometers. The MPCs built of PbWO4 scintillating crystals were installed into PHENIX last year and already accumulated data during last PHENIX data taking period.
The Tungsten-Silicon Nose Cone tracking calorimeters are currently in the final stage of intensive R&D program with system prototype fully implementing readout of the future detector recently tested in the particle beams at CERN. Funding commitments to NCC construction are pending.
This talk will briefly review the basic design ideas of the PHENIX multicomponent calorimetry system and present available performance data collected in the test beam and during PHENIX running. The priority will be given to new ideas developed and implemented in the PHENIX upgrade phase.