THE PHYSICS OF THE PHENIX MUON ARMS

Kenneth F. Read
for the PHENIX Collaboration

*Physics Division, Oak Ridge National Laboratory,**
Oak Ridge, TN 37831-6372, USA
E-mail: read@mail.phy.ornl.gov

The PHENIX Muon Arms subsystem is currently under construction. The muon identifier panels are already installed and being commissioned. The expected performance and ability to address key PHENIX physics goals which rely heavily on the muon arms are discussed.

This subsystem will be used to measure vector meson production at forward rapidities for masses ranging from that of the ϕ to the Υ in collisions ranging from $p+p$ to $Au+Au$. The mass resolution is sufficient to resolve the J/ψ from the ψ' and the $\Upsilon(1S)$ from the $\Upsilon(2S+3S)$. Measurement of the differential suppression of the J/ψ, ψ', and $\Upsilon(1S)$ will provide information concerning whether a quark gluon plasma has been detected. We can expect to detect approximately 0.6 million J/ψ per arm per RHIC-year of minimum-bias $Au+Au$ collisions. The two muon arms provide large acceptance for high mass pairs at central rapidity. In addition, they allow a rich program to investigate the spin structure of the nucleon using polarized proton beams. Aspects of both the heavy ion physics goals and the spin physics goals of PHENIX involving muons will be described. Highlights of the present status of construction, installation, and commissioning will be described.

*Managed by Lockheed Martin Energy Research Corporation under contract DE-AC05-96OR22464 with the U.S. Department of Energy.