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June 27, 2016
22nd International Spin Symposium
Abstract submission

Title:

Preliminary Results of a Tungsten Powder Epoxy Scintillating Fiber EMCAL for sPHENIX

Abstract:

The sPHENIX detector is a proposed new detector at the Relativistic Heavy Ion Collider (RHIC). The sPHENIX physics program focuses on jets and hard probes of the quark gluon plasma (QGP). The sPHENIX detector will also have the ability to study jets in polarized proton-proton and proton-nucleus collisions and could also serve as part of a detector for an electron ion collider.

The proposed design of the electromagnetic calorimeter (EMCAL), made of a tungsten powder and epoxy composite with embedded scintillating fibers, is designed to have a small Molière radius and short radiation length. It will be located at a radius of about 90 cm from the interaction region. It will have an energy resolution around $12\%\sqrt{E}$ and will be used in conjunction with a new hadronic calorimeter (HCAL) to provide a jet energy resolution of about $\sigma_E/E=120\%\sqrt{E}$. This design is to resolve single photons and electrons, as well as photon jets, in the high multiplicity environment of central heavy ion collisions. The η and ϕ segmentation of the EMCAL is 0.024×0.024 .

The April 2016 calorimeter beam test has taken place at Fermilab. In this talk, I will discuss the construction of the EMCAL and the analysis of the data in light of the sPHENIX performance requirements.