



Contribution ID: 634

Type: **Poster**

Silicon strip detector R&D for the sPHENIX tracker

Tuesday 29 September 2015 16:30 (2 hours)

The sPHENIX detector is a major upgrade to the PHENIX detector at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory and is designed for exploring a vast range of physics areas including heavy quarkonia suppression via the three Υ states and tagging of charm and beauty jets.

Among the sPHENIX detector, additional precision tracking inside the 1.5 tesla BaBar superconducting solenoid, as well as the currently operating PHENIX silicon vertex tracker, play a crucial role to reduce fake track contributions and improve the momentum resolution, thus leading to separation of the three Υ states and to separation of charm and bottom quarks.

A charged particle tracking system, consisting of two layers of the silicon pixel detectors and five layers of the silicon strip detectors placed circumferentially in the radial space from 2-80 cm, will perfectly satisfy the above requirements.

In this poster, we will discuss the physics potential of the sPHENIX detector, the design and technology choices for the sPHENIX silicon tracker system, and the performance of the prototype tracker module.

On behalf of collaboration:

PHENIX

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Session Classification: Poster Session

Track Classification: Future Experimental Facilities, Upgrades, and Instrumentation