

# Study of $b\bar{b}$ production in $p + p$ collisions at $\sqrt{s} = 510$ GeV in the PHENIX experiment at RHIC

Heavy flavor quarks are an important probe of the initial state of the Quark Gluon Plasma formed in heavy-ion collisions.

Bottom and charm quarks are produced early in the collision, primarily through hard interactions, and experience the full time evolution of the medium.

Understanding bottom quark production in  $p + p$  collisions gives a baseline reference for studying larger collision systems.

The measurement of the  $b\bar{b}$  cross section gives insight into  $b$  quark production mechanisms which can directly test pQCD predictions.

The  $b\bar{b}$  signal can be isolated by taking advantage of the properties of  $B^0$  oscillations in the invariant mass region of 4-10 GeV.

Measuring like-sign dimuons within this mass range provides an enriched bottom signal with a minimal amount of open charm background and without any contributions from quarkonia or Drell-Yan pairs.

$b\bar{b}$  will be measured through the semi-leptonic decay like-sign dimuon signal, in the rapidity range  $1.2 < |y| < 2.2$  and at  $\sqrt{s} = 510$  GeV from data recorded in 2013 at the PHENIX experiment.

In this poster, the status of the  $b\bar{b}$  production study will be presented.

## Preferred Track

Open Heavy Flavors

## Collaboration

PHENIX

**Primary author:** HASELER, Tristan (Georgia State University)

**Presenter:** HASELER, Tristan (Georgia State University)

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