**Abstract**

Particles containing heavy quarks are very useful tool to investigate the properties of hot and dense matter produced in early stage of the relativistic heavy ion collision in terms of the mechanisms of their interaction with nuclear matter. This can be studied by non-photonic electrons (NPE) coming from semi-leptonic decays of heavy flavor hadrons. In year 2010, STAR has collected a large sample of minimum bias Au+Au events at $\sqrt{s_{NN}} = 200$ GeV with newly implemented full barrel Time-Of-Flight detector. This enables us to analyse NPE production in the low $p_T$ region ($0.2 < p_T < 2.0$ GeV/c) with high statistics.

In this presentation we report status of the low $p_T$ NPE analysis in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV at STAR.

**Motivation**

- **Heavy Flavor** in heavy-ion collisions
  - Created mostly in initial parton-parton hard scatterings
  - Interaction with hot and dense QCD matter differently from that of light quarks.
  - Study flavor dependence of parton energy loss mechanisms.

- **Non-photonic electrons (NPE)**
  - Semileptonic channel have high B.R. of open heavy flavor mesons.
  - Easy for triggering and identification.

**Photonic electrons (PE)**

- We used the “reconstruction method” to statistically subtract the contribution of photonic electrons from inclusive electrons.
- We estimate the photonic electron contribution using $e^+e^-$ pairs with invariant mass $< 0.05$ GeV/$c^2$ in real data.
- $\gamma \rightarrow e^+e^-$ photon conversion in the material in STAR detector.
- $\pi^0 \rightarrow \gamma e^+e^-$ (B.R. = 1.174 ± 0.035%)
- $\eta \rightarrow \gamma e^+e^-$ (B.R. = 0.70 ± 0.07%)

**Summary and outlook**

- **Summary**
  - Low $p_T$ NPE analysis in heavy ion collisions is being studied.
  - Estimation of Electrons yield is very sensitive by fitting constrains.
  - Need more reasonable fit constrains with mis-matched and merged particles.
  - Photonic electron yield estimation with Rec. method and corrected with $\pi^0$ embedding simulation.

- **Outlook**
  - Electron purity study (including mis-matched and merged particles)
  - Photonic electron reconstruction efficiency study ($\eta^0$ and $\gamma$ …)
  - Systematic error study