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Dielectron Continuum in p+p Collisions

Tuesday 5 September 2023 17:30 (2h 10m)

In this poster, PHENIX presents a proof of principle study for the measurement of prompt and non-prompt e^+e^- pair production in the intermediate mass range ($m_\phi < m_{ee} < m_{J/\psi}$) using p+p data at 200 GeV taken in 2015. PHENIX plans to extend the measurement to the high statistics Au+Au data-set recorded in 2014 and 2016, with the goal to isolate the expected prompt thermal contribution in the intermediate mass region from non-prompt pairs from heavy flavor decays. In p+p collisions the main physics signal in this mass region originates from semileptonic decays of charm and bottom $q\bar{q}$ pairs. The e^+ and e^- origin from decays many micron away from the interaction point. This non-prompt component is identified statistically by measuring the distance of closest approach (DCA) with the PHENIX silicon vertex detector (VTX). The VTX has four layers with a total radiation length of about 15\%, thus electrons from photon conversions cause a significant combinatorial background for the measurement, even in p+p collisions. We have developed rejection techniques that effectively eliminate this background, improving the signal-to-background ratio by orders of magnitude. We will present the e^+e^- pair spectra from p+p collisions and its non-prompt contributions.

Category

Experiment

Collaboration (if applicable)

PHENIX

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