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## Reconstruction of photons and neutral mesons in heavy-ion collisions with MPD at NICA

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The Multi-Purpose Detector (MPD), currently under construction at the NICA complex at JINR, is designed to be the primary experiment for studying heavy-ion collisions in the energy range of  $\sqrt{s_{NN}} = 4-11$  GeV. The MPD aims to explore the baryon-rich region of the QCD phase diagram to investigate the possible existence of a first-order phase transition and a critical end-point. The measurement of direct photon and neutral meson production is a key part of the MPD physics program.

We will present results of physics feasibility studies for photon and neutral mesons ( $\pi^0$  and  $\eta$ ) reconstruction with the MPD detector in Bi+Bi collisions at  $\sqrt{s_{NN}} = 9.2$  GeV simulated using realistic event generators. Photon measurements are performed using two methods, including the identification of photon clusters in the electromagnetic calorimeter (ECAL) and the reconstruction of photons in the tracking system as dielectron pairs produced through conversions in detector materials (PCM). Neutral meson signals are analyzed using the invariant mass method by combining photon pairs from ECAL-ECAL, PCM-PCM, and ECAL-PCM sources, with the uncorrelated combinatorial background estimated through the event-mixing technique. The measured  $\pi^0$  and  $\eta$  transverse momentum spectra are compared to truly generated ones to estimate robustness of the developed reconstruction procedures.

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