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Performance for inclusive photon and neutral pion spectra and anisotropic flow measurements with the MPD experiment

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Direct photons produced in electromagnetic processes in heavy ion collisions do not interact with other particles in the collision zone. Analysis of direct photon spectra and anisotropic flow could provide additional information on the conditions at the production time and on the development of collective flow. Spectra and flow of direct photons are quantified based on the corresponding observables for inclusive photons and neutral pions, the main source of decay photons. Moreover, results for neutral pions may help to constrain properties of hot and dense nuclear matter thanks to robust particle identification and wide coverage in transverse momentum.
We present the performance for inclusive photon and neutral pion spectra and anisotropic flow measurements with the MPD experiment in both collider and fixed-target regimes. The study was done using simulations of detector response to particles produced by the UrQMD event generator with realistic algorithms of event reconstruction and analysis. Different methods for photon and neutral pion reconstruction are considered to estimate possible systematic biases.

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