

An exploratory study of direct photon reconstruction with HADES

The High Acceptance Di-Electron Spectrometer (HADES) is located at GSI Darmstadt and aims at exploring the properties of matter at high baryon densities via high precision measurements of di-leptons and hadrons.

In this contribution, we discuss the potential of HADES to reconstruct direct photons from Au+Au collisions at 1.23 AGeV beam energy and present first results obtained from data acquired in a related run in 2012. Given that HADES is not yet equipped with an electromagnetic calorimeter, our analysis relies on an indirect detection of the direct photons. The method employed bases on reconstructing photons undergoing a conversion, via the di-electron pair created in this conversion. The approach is complicated by the fact that HADES is optimized for minimizing the related conversion process, which contributes to the background of other measurements.

We discuss in details the method of the direct photon reconstruction used and describe how to correct for the impact of combinatorial background and Dalitz decays. Moreover, we present an extension of the study to the so-called “direct photon puzzle” observed by PHENIX and ALICE experiments. For this purpose, we use various cocktails with a particular focus on the contribution of photons from baryon decays to the inclusive photon spectra, which is typically not considered as a part of cocktail.

Preferred Track

Baryon-Rich QCD Matter and Astrophysics

Collaboration

Other

Primary author: DEVEAUX, Christina

Presenter: DEVEAUX, Christina

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