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Preservation of the Direct Photons and Neutral Pions Analysis in the PHENIX Experiment at RHIC

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The PHENIX Collaboration has actively pursued a Data and Analysis Preservation program since 2019, the first such dedicated effort at RHIC. A particularly challenging aspect of this endeavor is preservation of complex physics analyses, selected for their scientific importance and the value of the specific techniques developed as a part of the research. For this, we have chosen one of the most impactful PHENIX results, the joint study of direct photons and neutral pions in high-energy d+Au collisions. To ensure reproducibility of this analysis going forward, we partitioned it into self-contained tasks and used a combination of containerization techniques, code management, and robust documentation. We then leveraged REANA (the platform for reproducible analysis developed at CERN) to run the required software. We present our experience based on this example, and outline our future plans for analysis preservation.

References

Experiment context, if any

Heavy-Ion experiment at RHIC, leveraging the Electromagnetic Calorimeter capabilities.

Significance

The Data and Analysis Preservation effort in the PHENIX Experiment at RHIC has expanded in the past year, with many additional elements of the direct photon and neutral pion analysis added to the preservation framework. This is the first such effort at RHIC and experience gained in this process will be useful for the Nuclear Physics community.

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