

Abstract Submitted
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Extracting a latent space representation of dijet measurement in p-Pb and Pb-Pb collisions using Variational Autoencoders STUTI RAIZADA, University of California, Berkeley — Small systems (proton-proton and proton-nucleus) displaying features that resemble those exhibited by the Quark Gluon Plasma (QGP) formed in heavy-ion (nucleus-nucleus) collisions have been observed. Dijet measurements capture information about the presence of Quark Gluon Plasma because jets interact with the medium and lose energy as they traverse it. Certain structures of deep neural network models, called Variational Autoencoders, are capable of learning a meaningful latent space which is a compressed representation of the features given as input to the neural networks. Such a latent space could be used to explore observables that lead to different results depending on the presence and absence of the QGP. The dependence of these latent observables on the originally measured observables is estimated. These latent observables are verified to work as discriminators of QGP activity by analyzing proton-Lead and Lead-Lead collision data produced at an energy scale of 5.02 TeV by the ALICE (A Large Ion Collider Experiment) detector at the LHC (Large Hadron Collider). The implications of this work to explain system size dependence of measurements in the collision data is discussed.

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