Title:	Application of deep learning techniques to chracterize quark gluon plasma
Authors:	Verma, Yogesh. (/jspui/browse?type=author&value=Verma%2C+Yogesh.)
Keywords:	Quark Gluon Plasma
Issue Date:	28-Jul-2021
Publisher:	IISERM
Abstract:	Heavy Ion collisions are dominantly studied to recreate the conditions after the Big Bang i.e. highly energetic medium composed of weakly coupled quarks and gluons known as Quark Gluon Plasma. The scale of these collisions are 200 times greater than proton proton collisions giving rise to new physics and several new interactions. Moreover, with the ad- vent of new accelerator upgrades in the near future will lead to higher data volume posing a challenge both technologically and computationally. Hence, we are faced with numerous challenges ranging from simulation to object reconstruction. We invesitgate the novel so- lution for these current challenges by developing new state of art algorithms and softwares inspired by underlying physics using machine learning techniques. The physics basis of these machine learning techniques will furnish them with the physics happening beneath the processes and will help them to work with a better efficiency as compared to current algorithms. Firstly, we explore the regime of modelling by fast event generators using Gen- erative Adversarial Networks (GANs) and then transition to real experimental challenges of reconstruction and identification. These include track reconstruction, jet searches and shower identification in calorimeter. We shed light on limitations, and provide a novel em- pirical validation of these developed algorithms. We believe that these algorithms states as a promising deep learning solution for addressing and solving various problems in domain of experimental high energy physics.
URI:	http://hdl.handle.net/123456789/3782 (http://hdl.handle.net/123456789/3782)
Appears in Collections:	MS-16 (/jspui/handle/123456789/3766)