

Title: Study of jet production with the ALICE experiment at the LHC

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Abstract: The theory of strong interaction, quantum chromodynamics, predicts a phase transition between hadronic matter and the quark-gluon plasma where quarks and gluons are deconfined. This state of matter is expected to be created in ultra-relativistic collisions of heavy ions. Jets from partons which interact with the strongly interacting matter created in heavy-ion collisions can be used as probes to study this medium. The ALICE experiment installed at the Large Hadron Collider at CERN enables using jets to study medium in heavy-ion collisions. An analysis of data measured with the ALICE experiment in 2010 in the lead nuclei collisions at energy $\sqrt{s_{\text{NN}}} = 2.76$ TeV is presented in the thesis. The results of this analysis are presented in a study of jets reconstructed with the k_t and anti- k_t algorithms. The study includes an analysis of tracks, an analysis of background and focuses on an analysis of inclusive jet spectra. Various aspects of jet spectra are studied including modification of jets in the central collisions expressed by the ratio R_{CP} . Also a summary of author's short-term project on monitoring the Silicon Drift Detectors of the ALICE experiment is presented.

Keywords: heavy ions, jets, jet algorithms