

Heavy Quark Energy Loss in High Multiplicity Proton Proton Collisions at LHC

One of the most promising probes to study deconfined matter created in high energy nuclear collisions at RHIC and LHC is the energy loss of (heavy) quarks. It has been shown in experiments at the Relativistic Heavy Ion Collider that even charm and bottom quarks, despite their high mass, experience a remarkable stopping in the Quark Gluon Plasma.

In this exploratory investigation we study the energy loss of heavy quarks in high multiplicity proton-proton collisions at LHC energies. Although the colliding systems are smaller than compared to those at RHIC (p+p vs. Au+Au) the higher energy leads to multiplicities comparable to Cu+Cu collisions at RHIC. The high energy densities reached in LHC collisions might create a deconfined state of matter even in elementary reactions. The interaction of heavy quarks with this environment gives rise to a non-negligible suppression of high momentum heavy quarks in elementary collisions.

This probe will allow to further pin down the physical quantities of the phase transition to the Quark-Gluon-Plasma at LHC energies.

S.Vogel, P.B.Gossiaux, K.Werner, J.Aichelin,

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Primary author: Dr VOGEL, Sascha (Subatech)

Co-authors: Prof. AICHELIN, Joerg (Subatech); Prof. WERNER, Klaus (Subatech); Prof. GOSSIAUX, Pol Bernard (Subatech)

Presenter: Dr VOGEL, Sascha (Subatech)

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