

Plenarvortrag

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Hot QCD matter produced in heavy-ion collisions at the LHC

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Collisions of heavy ions at ultra-relativistic energies produce small amounts of matter at extremely high temperatures and energy densities, for short times. Under these conditions, quantum-chromodynamics predicts the transition from a hadron gas to a quark-gluon plasma (QGP), in which partons are no longer confined in hadrons. These conditions are realized at the Large Hadron Collider at CERN, where a center-of-mass energy per nucleon pair of a few TeV is reached.

A very rich experimental program at the LHC is lead by the ALICE Collaboration and significantly complemented by the other three large experiments, ATLAS, CMS and LHCb. From the heavy-ion physics campaigns at the LHC since 2010, a wealth of experimental results is emerging. A selection of observables sensitive to the properties of the QGP will be introduced, and recent results will be presented. The path from the experimental measurements towards the determination of fundamental properties of strongly-interacting matter will be discussed. The exciting experimental plans for the coming years will be presented: lead-ion collisions at 50 kHz interaction rate at the LHC from 2021 onward will provide high statistics of precision data and open new frontiers in the field.