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## LHCb highlights in heavy ion collisions

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Studies of heavy ion collisions shed light on dense QCD systems and non-perturbative effects such as gluon saturation in nuclei, deconfinement, and hadronization mechanism in the medium. The LHCb collaboration has been developing a full heavy ion program studying dense QCD medium that utilizes both fixed-target and beam-beam collisions. Thanks to the forward instrumentation of the LHCb spectrometer, data taken with both collision configurations can probe unique kinematic regions at small and large Bjorken- $x$  in detail. The precise vertexing and full particle identification allow a wide variety of hadron species to be reconstructed down to very low transverse momentum. The fixed-target configuration covers an unexplored energy range that lies between the SPS and the top RHIC energy.

We present new LHCb results from both beam-beam and fixed-target collisions, including nuclear modification at low Bjorken- $x$ , heavy quark hadronization in small and large systems, charm production in fixed-target collisions, and charmonium photoproduction in ultraperipheral PbPb collisions.

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