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V0 production studies at LHCb using the first LHC data

Although QCD is firmly established as the fundamental theory of strong interactions, the fragmentation process from partons into hadrons is still poorly understood. Phenomenological models tuned to Tevatron data show significant differences when extrapolated to LHC energies. The hadronization process can be probed at the LHC by studying V0 production, i.e. the production of KS mesons and Lambda hyperons. The LHCb experiment, with a rapidity range complementary to that of the other LHC detectors, offers a particularly interesting environment, covering the forward region where the existing models are very tunable but lack predictive power. The first 100 millions minimum bias events at LHCb will already provide a high-statistics and high-purity V0 sample. Measurements will include differential cross sections and production ratios for different strange particles as a function of rapidity and transverse momentum. The analysis can naturally be extended to cover heavier hyperons as well, and eventually lead, with larger data sets obtained with a J/psi trigger, to b-baryon spectroscopy with J/psi-hyperon final states.

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