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SELECTED PHYSICS MEASUREMENTS FOR THE LHCb EXPERIMENT AND THE RADIATION MONITORING SYSTEM

The LHCb experiment at the Large Hadron Collider (LHC) is dedicated to studies of rare phenomena in b - and c -decays in order to precisely constrain the Standard Model parameters and search for beyond Standard Model signatures. The LHCb detector is fully installed and commissioned; first data from pp collisions are being experienced. Physics performance of the LHCb experiment in constraining Standard Model parameters is illustrated with the expected reach on the CKM angle measurements, $B_{d,s}$ mixing phases and the angle γ of unitarity triangle. New physics search in the b -sector is discussed at the examples of rare decays $B_s \rightarrow \mu^+ \mu^-$ and $B \rightarrow K^* \mu^+ \mu^-$, as well as photon helicity studies in the $B_s^0 \rightarrow \varphi \gamma$ mode. Radiation level measurement for the silicon inner tracker operation and beam condition monitoring with the Radiation Monitoring System, developed at Kiev Institute for Nuclear Research, are discussed.

Keywords: LHCb experiment, CP violation, B_s^0 -meson radiative decay, radiation monitoring system.