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Towards the measurement of electromagnetic dipole moments of strange and charm baryons at LHC

Electric dipole moments (EDM) of fundamental particles provide powerful probes for physics beyond the Standard Model. Magnetic dipole moments (MDM) of baryons provide further information on the baryon substructure and represent experimental anchor points for tests of low-energy QCD models, related to non-perturbative QCD dynamics. These have not been experimentally accessible to date for the case of heavy baryons, due to the difficulties imposed by their short lifetimes. In the recent years, novel experimental techniques have been proposed to extend the worldwide intense experimental program of electromagnetic dipole moments measurement to heavy baryons. The technique is based on the spin precession in the LHCb dipole magnet (for the Lambda baryon) and in a bent crystal installed in the insertion region IR3 at LHC (for charmed baryons). Feasibility studies of the proposed experiment in IR3 will be discussed, along with the demonstration to reconstruct Lambda baryons with tracking stations downstream the LHCb dipole magnet. Perspectives of the dipole moments measurement during LHC Run3 will be outlined.

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