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Measuring the Magnetic Dipole Moments of Short Living Particles Using Bent Crystals

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We discuss a possibility of measuring the magnetic dipole moments (MDM) of short living particles by studying their spin precession induced by the strong effective magnetic field inside the channels of a bent crystal.

This method was proposed by Baryshevsky in 1979 and its first and only experimental realisation was carried out in Fermilab at the 800GeV proton beam for measuring the MDM of the strange Sigma baryon.

In the current study we consider various experimental setups, and find the optimal setup schemes and properties for measuring the MDM of short living particles, and present a detailed sensitivity study showing the feasibility of such experiments at the LHC in the coming years.

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