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Silicon Pixel Detector Development for a Bent Crystal Channeling Efficiency Measurement at the LHC

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A proof-of-principle setup with two bent silicon crystals is planned to be operated during LHC Run 3. It serves as preparation for an experiment aimed at measuring the dipole moments of charm baryons, from LHC Run 4 onwards, relying on the phenomena of particle channeling and spin precession in the bent crystals.

A silicon pixel module, based on the LHCb Velo sensors, is currently under construction for the proof-of-principle setup. Its task will be to measure the deflection of protons with energies in the TeV range that have been channeled in the bent crystals. The detector will operate in the secondary vacuum of a movable chamber (Roman Pot), which can be positioned inside the LHC's main vacuum.

This contribution discusses the design and integration of the detector module and Roman Pot, along with its expected performance.

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