

The LHCb VELO detector: operation, performance and future upgrades

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The VELO is the detector surrounding the interaction region of the LHCb experiment, responsible of reconstructing the proton-proton collision as well as the decay vertices of long-lived particles. It consists of 52 modules with hybrid pixel technology, with the first sensitive pixel being at 5.1 mm from the beam line. It operates in an extreme environment, which poses significant challenges to its operation. The detector performance in the first two years of operation will be presented.

In order to fully exploit the High-Luminosity LHC potential in flavour physics, a Phase-II Upgrade of the detector is proposed. Due to the extreme environment of HL-LHC, the design of the upgraded detector is particularly challenging: assuming the same hybrid pixel design and detector geometry, the front-end electronics of the VELO Upgrade-II will have to cope with rates as high as 8 Ghits/s, with the hottest pixels reaching up to 500 khits/s. The status of the Upgrade-II project will be discussed.

Alternate track

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