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LHCb's future vertex detector

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A major upgrade of the LHCb experiment is planned to start taking data in 2020.

The LHCb Vertex Locator will be replaced by a new and highly novel detector.

It will be based on radiation hard hybrid pixel sensors, with a pixel dimension of $55 \times 55 \mu\text{m}$, cooled using CO_2 flowing through microchannels integrated into the silicon.

During operation, the sensors will be only 5 mm from the LHC beams.

The general design, optimisation process and expected performance of this Vertex Locator will be described.

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