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Run II Radiation Damage Effects and Operation of the LHCb Vertex Locator

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The LHCb Vertex Locator (VELO) is a silicon micro-strip detector operating extremely close to the LHC proton beams. During nominal data-taking the innermost active strips are as close as ˜8 mm to the beams. This proximity makes the LHCb VELO an ideal laboratory to study radiation damage effects in silicon detectors.
There are numerous challenges for VELO, both in proton and ion runs.
The VELO operation is monitored with a dedicated scans: IT, IV and CCE.
The CCE scans provide the best handle on to project the bias voltages needed to operate the VELO efficiently throughout LHC Run 2. Run 2 of the LHC exceeds the radiation damage requirements the LHCb VELO was originally designed for. The latest results from radiation damage studies and their impact on the operation of the LHCb VELO in LHC Run 2 will be presented.

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