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Calibration of the LHC Diamond Beam Loss Monitors for LHC Run 3

Sunday, 7 May 2023 16:00 (2 hours)

A set of twelve Polycrystalline Chemical Vapour Deposition (pCVD) diamond detectors are installed in the beam injection, extraction and betatron collimation areas of the Large Hadron Collider (LHC) as fast beam loss monitoring detectors. Their high-radiation tolerance and time resolution in the order of a few ns makes them an ideal candidate to monitor bunch-by-bunch losses in the LHC beams, which have a nominal bunch separation of 25 ns. Considering their location in some of the most critical areas for beam loss studies, a signal-to-lost-particle calibration of these detectors provides a useful insight of the various LHC bunch-by-bunch beam loss mechanisms.

This contribution shows the principle of the calibration of the LHC diamond Beam Loss Monitors (dBLMs) as well as a description of the machine tests run to study and perform this calibration.

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Footnotes

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