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## **Recent progress on luminosity calibration at the LHCb experiment**

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Measuring cross-sections at the LHC requires the luminosity to be determined accurately at each centre-of-mass energy  $\sqrt{s}$ . The ALICE, ATLAS, CMS and LHCb experiments use the Van der Meer (VDM) method to determine the luminosity. In addition, LHCb uses a novel method based on beam-gas imaging (BGI) to perform a complementary calibration. Considerable effort has been invested at the LHC in the past few years to understand systematic limitations and improve the precision of such calibrations down to the level of 1-2%. Transverse beam shape non-factorizability has been found to be one of the limiting factors, along with the length scale calibration, beam stability and fit models. Here, an overview of the most recent findings on luminosity calibration from the ALICE, ATLAS, CMS and LHCb experiments in p-p collisions ( $\sqrt{s} = 13$  and 5 TeV) and Pb-Pb collisions (5 TeV) is presented.

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