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Instantaneous luminosity calibration of the ATLAS experiment with $Z \rightarrow \mu^- \mu^+$

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In this talk, a new method of calibrating the instantaneous luminosity of the ATLAS experiment with $Z \rightarrow \mu\mu$ process is presented. At the designed center-of-mass energy of the LHC, cross-section of $Z \rightarrow \mu\mu$ process is known to a very high precision and has a very good production rate (~1000 events/minute), which makes it suitable for luminosity measurement. Leading systematic uncertainties in this method come from the Standard Model theory, which are totally different compared to the leading systematic uncertainties on the current ATLAS luminosity measurement based on the Van der Meer method. A comparison of results with the official ATLAS luminosity measurements is presented for the entire data collected in 2015 and 2016.

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