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Precision Luminosity Measurements in CMS with Run 2 and Run 3 Data

Luminosity determination is a cornerstone of precision physics at the CMS experiment. In this talk, we present the latest luminosity measurements from CMS, covering both proton-proton and heavy ion collisions recorded during Run 2 and Run 3. Emphasis is placed on recent advances in reducing systematic uncertainties associated with the absolute luminosity scale from van der Meer scans, as well as methods to correct for instrumental effects impacting luminometer stability and linearity. We also highlight the use of dimuon yields as a standard candle to cross-check and validate luminosity estimates across data sets. These developments are key to improving the precision of cross section measurements and enhancing the overall sensitivity of the CMS physics program.

Secondary track

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