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Measurement of the Branching Fraction Ratio of Ξ_b^- Baryon Decays Using Run 3 Data

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Abstract

We describe an ongoing analysis performed with the CMS experiment, studying decays of the heavy flavor baryon Ξ_b^-. The main result is the measurement of the branching fraction of $\Xi_b^- \to \Xi^- \psi(2S)$ relative to the normalization channel $\Xi_b^- \to \Xi^- J/\psi$, achieved with improved precision compared to previous measurements. The previous measurement of this ratio was found to deviate from the trend observed in analogous b-meson decays, and with the full statistics available from Run 3, this analysis aims to test whether this deviation persists. The analysis is based on a sample of pp collisions at $\sqrt{s} = 13.6$ TeV, collected during the 2022, 2023, 2024, and 2025 running periods of Run 3 of the LHC, corresponding to an integrated luminosity of 279 fb^{-1}. These are preliminary results and are subject to change.

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