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Particle Physics anomalies from Dark Matter

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In recent years, several experimental measurements have shown deviations from the Standard Model (SM) predictions. One such deviation is the anomaly in the measurement of $b \rightarrow sl^+l^-$ decays. Additionally, the long-standing muon $(g - 2)$ anomaly has been confirmed, now with a discrepancy of 4.2σ relative to the SM prediction. In this paper, we study the effects of new physics on the $Z \rightarrow b\bar{b}$ decay amplitude by considering a specific class of SM extensions that aim to solve these discrepancies and the existence of dark matter. We present a formalism to calculate the radiative corrections to the decay amplitude in this framework and use it to find bounds on the parameters of one of these models.

Author: SANTOS, André

Presenter: SANTOS, André