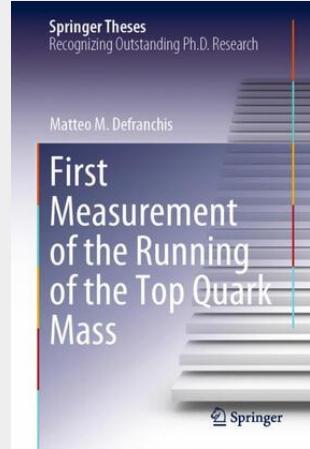


## First Measurement of the Running of the Top Quark Mass

In this thesis, the first measurement of the running of the top quark mass is presented. This is a fundamental quantum effect that had never been studied before. Any deviation from the expected behaviour can be interpreted as a hint of the presence of physics beyond the Standard Model. All relevant aspects of the analysis are extensively described and documented. This thesis also describes a simultaneous measurement of the inclusive top quark-antiquark production cross section and the top quark mass in the simulation. The measured cross section is also used to precisely determine the values of the top quark mass and the strong coupling constant by comparing to state-of-the-art theoretical predictions. All the theoretical and experimental aspects relevant to the results presented in this thesis are discussed in the initial chapters in a concise but complete way, which makes the material accessible to a wider audience.



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