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Recent results on EW physics at LHCb

The Electroweak sector of the Standard Model is currently being scrutinized with a extraordinary level of detail. Many of the Electroweak and QCD processes can be computed nowadays at several orders in perturbation theory, reaching an unprecedented precision. Thanks to the increasing sizes of the data samples collected at LHCb, together with the developments on the theory side, it is possible to perform high precision measurements that push the boundaries of our understanding of fundamental interactions. The LHCb detector offers unique capabilities in order to perform high precision measurements of QCD and EW observables in the high pseudorapidity region at the LHC. In this environment, certain quantities, like the weak-mixing angle, are less affected by uncertainties from the parton distribution functions, and the more simple geometry of the detector facilitates the evaluation of experimental biases. The LHCb coverage also provides the opportunity to constrain theory uncertainties when combining the measurements with the other experiments at the LHC, allowing to obtain an almost full coverage of the proton-proton interactions.

In this presentation, the most recent results of EW measurements performed at LHCb will be covered, with a special dedication to the latest Z boson mass result, the study of the effective weak-mixing angle and the measurement of the W boson mass. In addition, prospects for the analysis of the full Run 2 data sample will be shown as well as the expectations for the analysis of the Run 3 data, which have the potential to beat previous experiments and reach uncertainties smaller than those of the current global EW fit.

Secondary track

T05 - QCD and Hadronic Physics

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