

Angular analysis of the $B^0 \rightarrow K^{*0} ee$ decay with the LHCb detector

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Recent results in high energy physics experiments highlighted the importance of the heavy flavour processes in searching for clues of new physics. Indeed, hints of new physics can be found in semileptonic decays of B particles that occur via flavor-changing neutral currents (FCNC). The LHCb (CERN, Geneva) detector plays a very important role in these measurements, since it is designed for the study of particles containing b or c quarks. The Standard Model of particle physics states that electron, muon and tau have the same electroweak coupling strength, a concept known as “lepton flavour universality”, while experimental results point towards the violation of the universality. Confirmation of these results would pave the way to the discovery of new physics scenarios in these decays, for instance the observation of new heavy mediators. One of the golden channels is the rare $B^0 \rightarrow K^{*0} ee$ decay. This is a FCNC decay, hence only proceed through loop-level processes, therefore it is sensitive to possible contributions from heavy mediators, inaccessible to direct searches. The presence of electrons in the final state together with the low available statistic make this channel extremely challenging. Angular analyses on this decay channel have been previously performed by the LHCb, however a new analysis using improved analysis techniques and the full Run1 and Run2 datasets is being currently developed. These ongoing activities, that will lead to the “legacy” LHCb $B^0 \rightarrow K^{*0} ee$ angular analysis, will be discussed in this talk.

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