



Contribution ID: 388

Type: **Poster submission**

Decay of a bound muon to a bound electron

Thursday, August 8, 2019 10:40 AM (20 minutes)

Summary

A bound muon in the presence of a nucleus can decay to an electron, which has either continuous or discrete (bound) energy spectrum. The underlying physics in both cases differ a lot, and so is their importance. The Standard Model decay of a bound muon to an outgoing energetic electron provides a background in the experimental searches for the lepton- flavor-violating $\mu \rightarrow e$ conversions in the field of a nucleus, whereas the decay to a bound electron for large value of Z has its analogy with the QCD due to the strong electromagnetic coupling constant. The second case is the focus of this talk. This decay proceeds through the free muon decay in the presence of a spinless nucleus. The results of the decay rate calculated in two different approaches will be presented. In order to see if the two approaches coincide in certain approximations, we have considered two limiting cases: the muon and electron masses being almost equal and the small $Z\alpha$ limit. In these limiting cases, it is found that the two approaches are in good agreement.

Primary authors: Prof. CZARNECKI, Andrzej; Dr JAMIL ASLAM, Muhammad (University of Alberta); Dr ZHANG, Guangpeng; Ms MOROZOVA, Anna (University of Alberta)

Presenter: Dr JAMIL ASLAM, Muhammad (University of Alberta)

Session Classification: Poster Session (Thu/Fri)

Track Classification: Quark/Lepton Flavour Physics