Test of Lepton Flavour Universality: Study of $b \to sl^+l^-$ in LHCb

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The Standard Model is a relativistic quantum field theory description of the subatomic world. In this model the world is made up of fermions - quarks and leptons. Their interaction proceeds via the electromagnetic, weak or strong forces mediated by the gauge bosons. The Standard Model has stood the test of precision measurements so far. Yet its predictive power does not extend to astrophysic observations: it offers no explanation for gravity, dark matter, dark energy and matter-antimatter asymetry.

In the search for physics beyond the Standard Model, the LHC accelerator was built to collide protons at 13TeV centre-of-mass energy. One experiment collecting LHC collision data is the LHCb experiment. LHCb has a pseudorapidity region of $2 < \eta < 5$, optimised to study the decays of b and c quarks. A new physics search in b decays is test of lepton flavour universality - Standard Model decay rates are independent of lepton flavour. In particular, the rare b quark decays into an s quark and a di-lepton pair ($b \to sl^+l^-$) are studied.

This talk focuses on LHCb lepton flavour universality measurements in $B^0 \to K^{*0}l{+}l^-$, $B^+ \to K^+l{+}l^-$ and $\Lambda_b^0 \to pK^-l{+}l^-$ decays.