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Lepton Flavour Universality tests with b-baryon decays at the LHCb experiment

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Rare $b \to s\ell\ell$ transitions are strongly suppressed in the Standard Model (SM), making them sensitive to physics beyond the SM. Leptons from the different families have the same coupling to electroweak bosons in the SM, symmetry that is known as Lepton Flavour Universality (LFU). Precise measurements of LFU ratios in $b \to s\ell\ell$ decays provide, then, a very powerful null test of the SM. R_{pK} was the first LFU test involving b-baryons published by LHCb, which studies the decay ${}^{0}_{b} \to pK^{-}\ell^{+}\ell^{-}$ using Run 1 and 2016 data and yielded a compatible result with the SM within 1 standard deviation significance, as well as the first observation of the ${}^{0}_{b} \to pK^{-}e^{+}e^{-}$ decay. The new R_{pK} analysis includes full dataset (adds 2017-18 data), a full re-optimisation of the selection after the observation of the electronic decay, with particular focus on the MVA and particle identification requirements. Additionally, the measurement splitted in low and central q^2 regions will be provided. The preliminary results show a clear improvement of the statistical uncertainty (16% to 9.5%) with a better control of the backgrounds.

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