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B-decay discrepancies: how the picture changed after Moriond 2019

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We discuss the theory picture emerging from several updates and new measurements recently made available, in particular LHCb's RK update and ATLAS's measurement of Bs ⟶ μ μ. Data continue to strongly prefer new effects in semi-leptonic Wilson coefficients over the Standard Model. Interestingly, a purely muonic contribution to the combination C9 = −C10, well suited to UV-complete interpretations, is now favoured with respect to a muonic contribution to C9 only. The less than perfect agreement between b ⟶ s μ μ data and lepton-flavour-universality (LFU) violating data (RK(*)) can be accounted for by a LFU shift in C9. Intriguingly, such a shift can be renormalization-group induced from four-fermion operators above the electroweak scale, in particular from semi-tauonic operators, able to account for the potential discrepancies in b ⟶ c transitions. Such picture turns out to be fulfilled quantitatively in the simplified U1 leptoquark model. [Based on Aebischer et al., 1903.10434]

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