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Test of the Standard model and search for new physics using Unitarity triangle fits

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During the last 15 years, B-physics facilities have been giving enormous contributions to the consolidation of the Standard Model (SM) in the flavour sector. New analyses flowing from the LHC experiments, in particular LHCb, are now providing unprecedented insights into CKM metrology and new evidences for rare decays. The CKM picture can be tested with great precision, and very precise SM predictions can be obtained from global analyses. We present here the results of the latest global SM analysis performed by the UTfit collaboration.

In addition, Unitarity Triangle (UT) analyses, within and beyond the Standard Model (SM), are used to search for cracks in our current understanding and constrain the parameter space in possible new physics (NP) scenarios. We present an update of the UT analysis beyond the SM by the UTfit collaboration. Assuming NP, all of the available experimental and theoretical information on $DF=2$ processes is combined using a model-independent parametrisation. We determine the allowed NP contributions in the kaon, D, Bd, and Bs sectors and, in various NP scenarios, we translate them into bounds for the NP scale as a function of NP couplings. We also present the perspectives for future UT analyses on the basis of existing extrapolations of experimental results from the Belle-II and LHCb experiments, as well as of expected improvements from Lattice QCD computations.

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