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Measurements of $B^0 \rightarrow K^{*0} \mu^+ \mu^-$ and $C_{9\tau}$ at LHCb.

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The $B^0 \rightarrow K^{*0} \mu^+ \mu^-$ decay is mediated via the rare flavour changing neutral current transition $b \rightarrow s \ell^+ \ell^-$. The suppression of this decay in the Standard Model (SM) means virtual new physics (NP) contributions can have a large impact, and previous measurements of the decay have shown interesting tensions with the SM predictions at the level of $\sim 3\sigma$. The theoretical interpretation of these anomalies is difficult due to the uncertainties from nonlocal SM contributions which could mimic NP effects. This talk discusses recent results from the LHCb collaboration which uses the data itself to constrain the size of the nonlocal contributions to the $B^0 \rightarrow K^{*0} \mu^+ \mu^-$ decay rate, using the full dimuon spectrum. The first direct measurement of the short-distance $bs\tau\tau$ vector coupling, $C_{9\tau}$ is also presented, as well as prospects for the binned analysis of $B^0 \rightarrow K^{*0} \mu^+ \mu^-$.

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