Contribution ID: **757** Type: **Parallel**

Rare radiative-and-leptonic B_s-meson decay within and beyond the Standard Model

Monday 7 July 2025 08:45 (20 minutes)

Rare radiative-and-leptonic B_s-meson decay is a golden channel to scrutinize hypothetical New Physics (NP) effects in $b \to s$ quark transitions. Contrarily to the purely leptonic counterpart, i.e. $B_s \to \mu^+\mu^-$, it is sensitive to a larger set of Wilson coefficients and it is not helicity suppressed. The LHCb Collaboration has set a first limit on the Branching Ratio (BR) of radiative-and-leptonic B_s-meson decay in the region of high squared momentum transfer q^2, namely $\mathcal{B}(B_s^0 \to \mu^+\mu^-\gamma)[q^2 > (4.9\,\mathrm{GeV})^2] < 2.0 \cdot 10^{-9}$, and has also recently studied this channel at low-q^2 by directly reconstructing the produced photon.
In this talk, I will discuss about the main features of a novel phenomenological approach to the description of hadronic form factors in this channel at high-q^2, connecting its results with recent computations from lattice QCD. The corresponding theoretical predictions of the BR will be compared with available experimental limits, also presenting a brief overview of the different experimental techniques currently employed to study $B_s^0 \to \mu^+\mu^-\gamma$ decay. A dedicated sensitivity study of radiative-and-leptonic B_s-meson channel at high-q^2 will be also presented, highlighting the interplay that such an analysis can have with phenomenological studies of semileptonic $B \to K^{(*)}$ and $B_s \to \phi$ transitions.

Secondary track

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Session Classification: T07

Track Classification: T07 - Flavour Physics and CP Violation