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## **【345】 Search for $K^0 \rightarrow \pi^+ \pi^- \mu^+ \mu^-$ decays with the Run II LHCb data**

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Rare Kaon meson decays serve as highly sensitive probes for both heavy and light New Physics. Notably, the  $K_S \rightarrow \pi^+ \pi^- \mu^+ \mu^-$  process, which is of order  $10^{-14}$  in the Standard Model (SM), holds the potential to be enhanced by up to a factor of 100 in exotic Beyond the Standard Model (BSM) scenarios. The analysis of the  $K_S \rightarrow \pi^+ \pi^- \mu^+ \mu^-$  decay is anticipated to exhibit high cleanliness owing to the exceptional performance of the LHCb experiment in pion and muon reconstruction. Results for  $K_L \rightarrow \pi^+ \pi^- \mu^+ \mu^-$  will also be provided, for which there are no SM predictions. Herein, we present the current progress on the exploration of the  $K_S \rightarrow \mu^+ \mu^- \pi^+ \pi^-$  decay utilizing data from 2016-2018 of the LHCb experiment.

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