

The search for the very rare decays $B_{(s,d)} \rightarrow \mu^+ \mu^-$ at LHCb

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Review of the search for the very rare decays $B_s^0 \rightarrow \mu^+ \mu^-$ and $B^0 \rightarrow \mu^+ \mu^-$ with the LHCb experiment is presented. These decays are suppressed within the Standard Model as they can only occur via helicity suppressed loop diagrams. However, their amplitudes can be significantly different in many New Physics scenarios, especially in those with an extended Higgs sector. Therefore, these decays are a sensitive probe of physics beyond the Standard Model. The data collected in 2010 ($\sim 37 \text{ pb}^{-1}$) allowed LHCb to reach similar sensitivities to the existing limits from the CDF and D0 Collaborations. With the data accumulated so far in 2011 LHCb is entering uncharted territory.

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