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Charm production and rare charm decays at LHCb

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Flavour-changing neutral current decays such as $c \rightarrow u l^+ l^-$ are highly suppressed in the Standard Model (SM), but may be enhanced by New Physics. For $D^0 \rightarrow \mu^+ \mu^-$, the SM decay rate is dominated by long distance contributions but is still a few order of magnitudes below the current experimental limit. In decays such as $D^+ \rightarrow \pi^+ \mu^+ \mu^-$, measuring the differential branching ratio as a function of the $\mu^+ \mu^-$ -invariant mass is a sensitive probe for New Physics contributions. We present results of searches for rare charm decays with the 2011 LHCb data sample, corresponding to an integrated luminosity of 1.0 fb^{-1} .

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